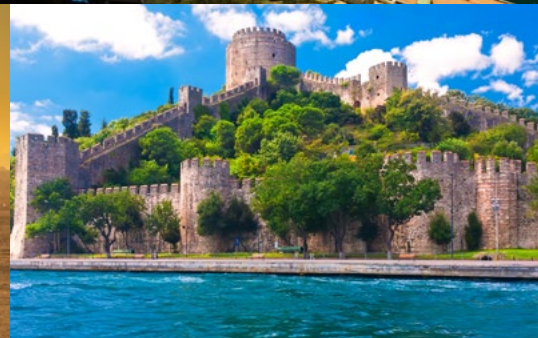




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C24.01-African Studies => Africa and Climate Change



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1055 - Understanding Climate Variability In Urban Africa Evidence From Johannesburg South Africa (1993–2023)

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Background and aim of the study

As global temperatures rise, city planning designs require increasing shifts toward resource-efficient systems to ensure good living standards. The presence and implementation of high-quality urban ecological infrastructure (UEI) is therefore critical for human well-being and urban security. Cities face the burden of increasingly high temperatures due to population density, poverty, amplified urban heat island (UHI) effects, and air pollution. Growing evidence of climate variability underscores the need for urgent improvements in urban planning and the reimagining of cities. UEIs are defined as the interconnected set of natural and man-made ecological systems and green spaces which provide ecological services within urban areas while performing traditional functions. The City of Johannesburg (CoJ), with its unique combination of urbanisation and changing climate patterns, presents a distinctive case study. This paper aims to investigate the climate variability trends observed in the CoJ from 1993 to 2023, focusing on the role of new and existing UEI in enhancing the city's adaptive capacities.

Materials and methods

This study applied the ClimPACT v3.1.6 software to analyse daily temperature and rainfall data.

Results

The results indicated increasing climate variability, with minimum and maximum temperatures rising by 0.03°C and 0.025°C and annual precipitation increasing by 5.407mm. Data indicates that Zones A, D, E, F and G in the city are the most vulnerable to climate impacts. The areas include Soweto, Joburg CBD, and Orange Farm. Such areas are densely populated with many built-up areas and informal settlements; as such, these areas require more attention.

Conclusion

The CoJ is facing increasing trends in climate variability, making the city unliveable for its inhabitants; major UEI interventions are required to ensure the city is sustainable and resilient to climate effects.



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1401 - Climate Mobilities And Adaptation In African Borderlands

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University Of Zululand, Geography And Environmental Studies, Empangeni-South Africa¹

Accelerating climate change and its intensifying impacts have exposed African borderland communities to heightened precarity and vulnerability. Vulnerability is multifaceted and shaped by intersecting socio-economic, political, and cultural dynamics. Borderlands are marked by disparities in wealth, political authority, economic development, and geographic position, leading to complex and multi-faceted climate change impacts. Moreover, climate change compounds existing issues, including violence, instability, and inadequate investment. Against this backdrop, this chapter deploys an Actor-Network Theory lens to examine how African borderland communities experience and respond to climate change. This is an exploration of how these communities have utilised borders as resources and/or instrumentalised them to adapt to climate change while acknowledging the violence which further perpetuates the climate coloniality ingrained in Eurocentric adaptation discourse. This study utilised a qualitative approach and draws upon existing case studies of African borderlands and incorporates empirical insights from interviews with selected climate vulnerable borderland communities, including Kaisosi on the Angola-Namibia border and Chimanimani-Chimoio on the Mozambique-Zimbabwe border. The findings reveal that borderland communities live with wide-ranging manifestations of climate change that transcend borders. Their ability to adapt is linked to internal and informal cross-border mobility, with gendered roles and norms influencing the instrumentalisation of the border. Overall, the paper demonstrates that community resilience can be strengthened when mobility is combined with place-based adaptation strategies grounded in local contexts and social relations.



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3172 - Assessment Of Livelihood Assets On Adaptation Strategies In Response To Climate Change Among Smallholder Farmers' In Northern Part Of Jigawa State Nigeria

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This paper explores the impact of climatic variability on smallholder farmers' livelihood assets (Physical asset) and adaptation approaches in northern Jigawa State. We proposed a new paradigm for the sustainable livelihoods of smallholders based on the grounded theory, to exploit physical household assets and climatic adaptation strategies based on farmers' livelihood. Purposive sampling and questionnaires were administered to 384 smallholder farmers from seven (7) local government areas were sampled and FGD were organized. Data were analysed using frequency distribution, tables and charts. The findings shows that age, education level and house hold sizes are the major determinant of livelihood choices in both locations. In Jigawa State, Flooding caused by climate variability/change has had an impact on buildings. Shelter was ranked as a key physical asset in the research area. During the post-period the result indicated fewer livestock due to climate variability, fishery activities declined this might imply that the drop is as a result of the effects of climate change in water supplies, Irrigation farm area decreased over the post-period. The result revealed Ox driven-Cart is an essential physical asset in the live of farmers. Bicycle, motorcycle and cars is another significant physical asset, which they use to transporting their goods to market or homes the effects of climate change was indirect on this assets. The study indicates that institutional-policies directly and indirectly, boost physical assets and exploit the farmer's sustainable livelihoods index successfully. Lastly, this research proposed policy suggestions for poverty reduction and sustainable livelihoods of small-scale growers.



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C24.01-African Studies => Africa and Natural Resource Use/Management



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1399 - Decolonising Entrepreneurship Perspectives From Africa

Inocent Moyo ¹, Jabulile Mzimela ¹, Lethiwe Zondo ²

University Of Zululand, Geography And Environmental Studies, Empangeni-South Africa ¹ University Of South Africa, Geography, Pretoria-South Africa ²

Indigenous entrepreneurship (IE) is gaining prominence globally. Yet, it remains insufficiently theorised in African contexts, where universal models of entrepreneurship are still applied in ways that do not fully reflect the lived realities and aspirations of Indigenous peoples. In response, this paper examines how Indigenous communities in South Africa define and practise entrepreneurship, and how they conceptualise entrepreneurial “success.” The study adopts a decolonial framework informed by the geopolitics of knowledge and draws on qualitative data from 10 interviews and two focus group discussions with Indigenous entrepreneurs in KwaZulu-Natal. Through this lens, the analysis explores how participants’ understandings of IE align with, challenge, or extend dominant scholarly and policy narratives. The findings show that participants define entrepreneurship through relational, cultural, and community-centred principles rather than individual profit maximisation. Success is defined as sustaining community livelihoods, strengthening social bonds, and protecting ecological and cultural resources. These priorities signal an alternative entrepreneurial epistemology that resists narrow economic indicators and affirms the legitimacy of Indigenous economic systems on their own terms. The paper argues that grounding entrepreneurship in Indigenous worldviews not only destabilises the presumed universality of mainstream entrepreneurship theories but also offers concrete directions for rethinking how success is measured and supported in policy and education. In doing so, it advances more inclusive, decolonial approaches that centre community autonomy and open up possibilities for reimagining development from the ground up.



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1460 - Politics Of Land And Conservation In The Dongola–mapungubwe Area In South Africa

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This study brings together past and present empirical materials to examine two relational kinds of politics, namely, the politics of land (exploring who has property rights over a particular piece of land) and the politics of conservation (understanding how power dynamics are expressed in nature conservation projects). The study analyses the connections between past politics of land and conservation, and contemporary land and natural resource conservation struggles in the Dongola–Mapungubwe area. I contend that addressing South Africa’s vexed present requires fuller reckoning with the country’s past. Recent literature suggests that current social science and political ecology scholarships lack this spatiotemporal juxtaposition. Specifically, the study highlights how land and conservation are politicised; it also looks at power dynamics in nature conservation initiatives. I argue that the establishment of nature conservation projects is not only determined by scientific knowledge and passion about conservation and resource management, but also by social and political processes at the local, regional and national level. The study is primarily informed by documents analysis (Hansards or House of assemblies, archives materials on Dongola, newspaper articles, Dongola Wildlife Sanctuary Act, SANParks reports and available literature on Dongola saga) and the fieldwork (semi-structured interviews and observation) conducted with game farmers, game managers, commercial irrigation farmers, farm managers, Mapungubwe National Park officials, farm workers, land claimants, and officials from Regional Land Claim Commission in Limpopo. The study concludes that passion and good intention alone are not sufficient inducements to the protection of nature, but involving local communities and those who are affected by protected areas can play a significant role in the success of conservation projects. This is essential to avoid unintended and sometimes harmful consequences that undermine conservation.



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2543 - Transboundary Conservation And Community Based Natural Resource Management In Southern Africa Reparative Promises And The Testing Of Environmental Justice In The Kavango–zambezi Transfrontier Conservation Area (zambia)

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Background

The management and use of natural resources in Africa have long been the subject of debate, often framed around tensions between extraction, conservation, and development. In Southern Africa, these debates have taken on renewed significance through transboundary conservation areas, which are presented as governance instruments capable of reconciling biodiversity protection, regional cooperation, and social inclusion. However, these initiatives are also embedded in critical debates concerning the persistence of neoliberal and colonial forms of conservation, grounded in the commodification of nature and the circulation of exogenous models.

Methods

Adopting a critical perspective, this paper proposes an exploratory reflection on community-based natural resource management (CBNRM) within the Kavango–Zambezi Transfrontier Conservation Area (KaZa TFCA), the largest terrestrial conservation area in the world. It draws on an ongoing research project, with fieldwork scheduled for May 2026. The analysis is situated within the field of environmental justice and seeks to examine the effective modalities of community participation, power relations among actors (states, NGOs, traditional authorities, and local communities), as well as the territorial reconfigurations induced by transboundary conservation. The study focuses on two Zambian conservancies—Simalaha and Inyasemu—considered as privileged sites for observing contemporary tensions between conservation and social justice.

Results and conclusion

From a Zambian perspective, this contribution interrogates the concrete reach of participatory mechanisms promoted by so-called “reparative” conservation policies in post-apartheid Southern Africa. Inheriting elements from both Peace Parks and conservancy models, these policies aim to reconfigure the governance of territories historically shaped by exclusion and dispossession. Yet this reparative rhetoric unfolds paradoxically within a context of increasingly restrictive conservation practices, marked by processes of securitization and militarization. This paper therefore seeks to critically discuss the gaps between the promises of justice associated with transboundary conservation and their practical translations within the policy instruments under consideration.



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C24.01-African Studies => African Development Challenges and Trajectories



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1172 - When The Investors Come Customary Land Formalisation And The Political Economy Of Aid In Liberia

Keegan Covey¹

Trinity College Dublin, Geography, Dublin-Ireland¹

Background

Customary land formalisation is of growing interest in African development policy, and has been underway in Liberia following the 2018 Land Rights Act (LRA). Formalisation is promoted as a means of enhancing tenure security, reducing disputes, and strengthening community agency. It is also embedded within broader aid-driven development agendas that emphasise investment, productivity, and market integration. This paper examines how foreign-supported customary land formalisation occurs in practice, with particular attention to how it is reshaping the political economy of land by reconfiguring authority, participation, and disputes within and between communities.

Materials and Methods

The study employs a qualitative interpretive research design combining semi-structured interviews and document analysis. Ninety-five interviews were conducted in two counties across three districts, encompassing approximately sixteen towns engaged in USAID-supported land formalisation initiatives in Liberia. Interview participants include customary leaders, community members and representatives, NGO workers, and state officials. Documentary sources include legislation and donor and project documents. Analysis applies thematic coding to examine land governance, dispute processes, and community participation within formalisation.

Results

Preliminary findings suggest that formalisation may be reducing the intensity of land disputes in the short term by channelling conflicts into formalised procedures and recognised governance structures. However, significant challenges remain in relation to community capacity for self-governance and dispute resolution without continued institutional or donor support. At the same time, customary land is increasingly framed as a leasable and investable resource, even where alienation is formally restricted.

Conclusions

The findings of this paper suggest that foreign-supported land formalisation in Liberia reconfigures the political economy of customary land, including the expectations that communities have towards outside investment and the perception of “custom” itself. These dynamics have important implications for African development trajectories, particularly in post-conflict contexts where aid, governance reform, and investment intersect.



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1625 - Social Justice And Capabilities In Transfrontier Conservation Evidence From The Maloti–drakensberg Region

Melissa Hansen¹

University Of The Free State, Geography, Clarens-South Africa¹

Background

This paper examines social justice in the Maloti-Drakensberg Transfrontier Conservation Area (MDTFCA) through a capability-based framework grounded in Amartya Sen's theory of justice. Transfrontier conservation areas are promoted as collaborative governance arrangements that transcend national boundaries to enhance biodiversity conservation, ecological connectivity, and regional cooperation. However, they often introduce governance dynamics that can reconfigure power relations, reshape access to land and resources, and generate new social justice challenges for communities living within and adjacent to these landscapes. This paper unpacks how conservation policies and governance practices shape which knowledge systems are legitimised and whose voices are included or excluded. It further investigates how these dynamics affect the real freedoms and capabilities of local communities in the MDTFCA.

Materials and Methods

This study employs a qualitative approach combining policy analysis, secondary data review, and semi-structured stakeholder interviews to assess capability outcomes in the MDTFCA. Conservation policies and governance frameworks were analyzed to contextualize findings. Interviews with community members, traditional authorities, conservation practitioners, and government officials explored resource access, participation, and the recognition of indigenous knowledge. Data were analyzed thematically using a capability-based framework.

Results

The findings indicate that land-use restrictions and neoliberal conservation approaches within the MDTFCA constrain local agency by limiting access to natural resources and excluding communities from meaningful decision-making. These governance practices reproduce historical injustices linked to land dispossession and unequal power relations, while privileging technocratic and market-driven forms of conservation. As a result, indigenous and local knowledge systems are marginalized, undermining community capabilities.

Conclusion

Adopting a capability approach to conservation and development in the MDTFCA can lead to more convivial, participatory conservation practices. This can enhance agency, inclusion, and socially just outcomes. The study provides insights into the politics of knowledge and power in conservation governance and offers guidance for more pluralistic, equitable, and sustainable strategies.



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2511 - Spatio Temporal Patterns Of The Urban Informal Economy In The City Of Umhlathuze South Africa

Mpendulo Harold Thulare¹, Innocent Moyo¹, Kwanele Phinzi¹

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The urban informal economy is a global phenomenon that shows massive exponential growth in both the developed and developing countries. This study investigated the growth of urban economic informality by analysing the trends and patterns to understand their impact on spatial planning in the City of uMhlathuze which is a secondary city in the Province of KwaZulu-Natal, South Africa. A mixed methods approach in the form of Geographical Information Systems (GIS) and in-depth interviews was used to collect data. GIS was used for the purposes of the spatial analyses of the township economy from 1994-2023, while also mapping the same. Thematic analysis was used to code and categorise responses from in-depth interviews conducted with research participants. Findings suggest that the pervasive nature of urban economic informality has configured and reconfigured the spatial layout of the City of uMhlathuze, causing numerous transgressions by operating in urban spaces that are not designated for informal trading. As a result, this has forced the City of uMhlathuze to be retrospective in its approach in order to curb persisting transgressions which continues to configure and reconfigure the spatial layout of the city. The findings also demonstrate a change in attitude and perception towards urban economic informality as contemporary spatial and urban planning practices and strategies in the city of uMhlathuze have started incorporating urban economic informality into mainstream spatial planning.



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C24.01-African Studies => Environmental Issues and Challenges in Sub-Saharan Africa



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1396 - Understanding Wildfires In The Cape Floristic Kingdom

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Sub-Saharan Africa is affected by many environmental phenomena and challenges. One of these challenges are wildfires. Wildfires occur naturally on Earth, however, their frequency, seasonality and severity have been significantly altered by human activities and to some extent, climatic changes. With the recent large-scale wildfire occurrences across the globe, several arguments have been highlighted to understand these phenomena. The aim of the study is to examine the nature of wildfires in the sensitive and unique Cape Floristic Kingdom of South Africa. This floristic kingdom contains many endemic species, including plant species used to brew herbal teas such as Rooibos tea. Latitudinal shifts in seasonal rain-producing weather systems have been detected in the Southern Hemisphere, affecting the duration of wildfires, prolonging dry seasons and increasing the number of flammable materials. The objectives are to determine the seasonality, frequency, fire size, duration of fire events and examining the ignition causes of wildfires in the Cederberg Mountains, using descriptive statistics and Geographical Information Systems (GIS) of wildfires for the years 1994-2024. The results of the study can assist the region with not only conserving endemic species in Africa, but also with crucial knowledge to inform disaster risk reduction and wildfire management policies.



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1425 - Border Towns Solidarity Networks And Deterritorialized Responses To Environmental Crises

Jabulile Mzimela¹

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This chapter employs the concept of collective efficacy to explain how women across borders and border towns mobilize to respond to the impacts of climate change. These networks of solidarity defy national boundaries and embody deterritorialized responses to environmental crises, further complicating the traditional view of statecentric governance that is disciplined and limited by sovereign territorial jurisdiction. The point is that the networks of collective efficacy which transcend borders to the extent of binding communities together show that deterritorialization is manifest. In all this, border towns in Africa provide focus points for cross border interaction and border trade and flows, cross-border (in)security, spatial transformation, development, and regional integration.



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1926 - Using A Remote Sensing Algorithm To Understand The Trend Of Uhii Over The City Of Johannesburg South Africa

Adeline Ngie¹, Khaled Abutaleb²

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Alterations of vegetated environments into urban spaces have led to corresponding changes to the thermal radiation of these surfaces and causing higher temperatures within city centres with negative effects to the millions of inhabitants ranging from socioeconomic to health challenges. There is also destruction on the biodiversity or ecosystems. There have been regeneration programmes for Johannesburg rooted in transformational strategies from National government such as the National Development Plan 2030 as well as provincial and municipal governments like the recently launched City of Johannesburg 2040 Growth and Development Strategy. This has seen not just old buildings being revamped but also the improvement of urban greening spaces. These spaces have included rooftop farming towards food security, recreational parks and others which should not only beautify the city but assist in the moderation of the heat intensity from the heat islands as established before. Therefore, through the mono-window algorithm, the thermal bands of the Enhanced Thermal Mapper Plus (ETM+) of Landsat images for 2013 to 2024 together with meteorological data was used to estimate the land surface temperature (LST) over the City of Johannesburg through a multi-phase methodology in a python processing which also outputs the intensity of the heat islands and how the intensity has persisted over space and time. This was a follow-up monitoring to understand the trend of the UHII over this city after recommendations from a previous study over a decade ago. This study investigated what the spatio-temporal distribution of the mean land surface temperature across the municipality over this period? And, how the urban heat island intensity (UHII) ranges across the municipality.

The results showed that over time the LST values over CoJ have not decreased but are dissipated across the city without the usual concentration of higher mean surface temperature at city centre. The northern parts have other heat island centres with surrounding planned suburbs with extensive vegetated gardens, pools or parks while the southern section is predominantly unplanned settlements, industries and mines with higher values. The average UHII was from -0.17oC to 3.49oC. Therefore, monitoring will support planning initiatives for sustainable urban spaces.



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2256 - Coping With Water Challenges A Selection Of Cases From South Africa

Anna Elizabeth De Jager¹

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Background/hypothesis

As part of the learning journey in a fourth-year Geography module, students were required to identify a challenge regarding resource use in their local context. This was followed by online discussions in the virtual learning environment. Students could comment on challenges identified by their peers and suggest possible coping strategies based on their own experiences or reading. Challenges related to water provisioning were most frequently selected. As part of their assignments, students had to develop an ArcGIS StoryMap to disseminate information about their identified challenge. An ArcGIS StoryMap comprises maps, text, and multimedia elements. The functionalities, such as navigation, pan/zoom, external links, and popups, make it an interactive information product.

Materials and methods

Ethical clearance was obtained to use the assignment answers provided by students for research purposes with their consent. During the learning period, the lecturer observed the online discussions and made notes on trends in assignment answers.

Results

Authentic cases were developed by students and presented in story map format. The story maps not only provide text and photographs, but also videos and interactive maps. Story maps on coping with water challenges were identified for inclusion in a new story map. The story map will be presented to illustrate the challenges of accessing water and recommended coping strategies.

Conclusions

ArcGIS StoryMaps was successfully applied as a teaching tool to link the life world of students to teaching and learning in an online environment. This also provided some authentic cases and recommendations for coping with challenges related to access to water.



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3175 - Land Degradation In Nigeria Spatial Patterns Drivers And Implications For Disaster Risk Reduction

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Background / Hypothesis

Land degradation constitutes a major environmental stressor in Nigeria, exacerbating vulnerability to natural hazards and constraining sustainable urban development. In rapidly urbanizing cities such as Aba, land transformation processes are intensifying ecological instability and disaster risk. This study hypothesizes that accelerated urban expansion, population pressure, and weak land governance significantly drive land degradation in Aba and that these processes directly amplify exposure to flooding, soil erosion, and livelihood insecurity.

Materials and Methods

The study integrates geographic approaches combining multi-temporal satellite imagery, GIS-based spatial analysis, secondary environmental datasets, and field-based observations. Land-use/land-cover changes over the past two decades were analyzed to map the extent and trajectory of soil erosion, deforestation, urban expansion, and related degradation processes. Socio-environmental data were examined to identify underlying drivers and assess their relationship with hazard exposure and vulnerability patterns.

Results

Findings indicate rapid urban land conversion, vegetation loss, and increasing surface imperviousness across Aba. Severe gully erosion, localized flooding, and declining soil quality were identified as dominant degradation manifestations. These patterns are closely associated with unregulated urban growth, unsustainable land management practices, extractive activities, and institutional weaknesses. The analysis further shows that degraded landscapes correspond spatially with flood-prone and socio-economically vulnerable communities, demonstrating how land degradation intensifies disaster risk and undermines resilience.

Conclusions

The study confirms that land degradation in Aba is both an environmental and risk governance challenge. By advancing a spatially explicit framework for identifying degradation hotspots, it highlights the value of GIS and remote sensing in disaster risk reduction planning. The paper recommends geographically targeted interventions, including ecosystem restoration, climate-smart land management, improved drainage infrastructure, and strengthened institutional coordination. Overall, the findings underscore the critical role of geographic analysis in diagnosing environmental stress and supporting resilience-building strategies in rapidly urbanizing regions of Nigeria.



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3227 - Urbanization Soil Redistribution And Sustainable Agriculture An Assessment Of Clay Rich Peri Urban Soils Of A Rapidly Urbanizing Town

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Background / Hypothesis:

Sustainable agriculture in rapidly urbanizing regions depends on understanding soil resource potential and its role in land-use management. Peri-urban areas are increasingly important for crop production and food security, often characterized by clay-rich soils formed from sediments transported by runoff from urban surfaces, construction sites, and exposed soils. Urban expansion intensifies surface runoff and sediment mobilization, leading to the deposition of nutrient-rich, moisture-retentive clay soils with high fertility potential. Despite their importance, empirical research on the fertility and sustainable productivity of these soils in peri-urban agriculture—particularly in cities of the Global South—is limited. This study hypothesized that the physicochemical properties and agricultural suitability of clay-rich peri-urban soils vary with topography, influencing their management potential and productivity.

Materials and Methods:

The study assessed clay-rich soils in the peri-urban areas of Kwali town, Abuja, Federal Capital Territory. Soil samples were collected from upper, middle, and lower slope positions at topsoil (0–15 cm) and subsoil (20–30 cm) depths. Analyses included bulk density, porosity, pH, electrical conductivity, organic carbon, total nitrogen, available phosphorus, exchangeable bases, micronutrients, and cation exchange capacity. Data were used to evaluate fertility, topography-driven variability, agricultural suitability, and constraints to identify sustainable management strategies.

Results:

The results revealed clear catena-driven variability. Middle slopes exhibited moderate bulk density, optimal pH, higher organic carbon, and greater nutrient availability, making them most suitable for vegetable production. Upper slopes were constrained by erosion and nutrient depletion, while lower slopes were limited by compaction and waterlogging. High variability in magnesium and potassium highlighted localized nutrient imbalances. Based on these findings, sustainable management strategies—including organic amendments, conservation tillage, erosion control, raised beds, and targeted fertilization—were proposed to mitigate constraints and enhance productivity.

Conclusions:

The study demonstrates that aligning soil management with topographic variability is essential to maximize the agricultural potential of clay-rich peri-urban soils. Implementing site-specific strategies can improve soil fertility, crop yields, and peri-urban food security, providing evidence-based guidance for sustainable agricultural development in rapidly urbanizing regions.



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C24.01-African Studies => Food Security and Human Survival in Africa



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1056 - Food For Thought Examining Tanzania's Rural Primary Schools As A Conduit For Agroecology And Improved Nutrition

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Rates of malnutrition are higher in Africa than any other world region, a situation that has grown worse over the past 10 years. As reported in the 2018 Tanzania nutrition profile, 34% of children under 5 suffer from stunting, 18% of adolescent girls experience low BMI and 45% of women of reproductive age suffer from anemia. This research examines the food security impacts on children of an NGO project in NW Tanzania working with model school farms (a legacy of Nyerere's Ujamaa) to introduce agroecological practices that help schools produce more food sustainably. These efforts provision school kitchens that prepare lunch for pupils. More specifically, this paper addresses three questions. 1) Is the agroecological training provided to model schools resulting in increased sustainable production and greater diversity of crops produced? 2) Are any improvements in the quantity and diversity of food produced reflected in the quality and number of school meals provided? 3) Are the meals provided to school pupils resulting in improvements in their food security and dietary diversity? These questions are addressed via interviews with school teachers and surveys of pupils using standard food security and dietary diversity measures (HFIAS, HDDS, MDDW). In contrast to agricultural development trends in the first part of the millennium (that emphasized high input agriculture, commercialization and the private sector), this research explores agroecology and rural public institutions as an alternative path to improved food security and nutrition. Schools are among the most functional institutions in rural Tanzania and an underexplored conduit for delivering improved nutrition.



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1085 - Euro Mediterranean Cooperation Climate Change And Food Security

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The destabilization of the global food supply chain by the Covid-19 pandemic and the Russian war in Ukraine has shown how contemporary societies are vulnerable to food insecurity, which reinforces territorial inequalities and social injustice, impacting first and foremost women, rural population and less educated people.

In order to build food resilience in a world affected by climate change - which adds pressure on land and water and reduce yield growth - agriculture development policies should be included in the green transition, with a focus on the most vulnerable categories: rural population, especially small farmers.

Food system should be reorganized at the Euro-Mediterranean level, due to the interdependence in terms of intrans and agriculture production among its members.

A coordinated Euro-Mediterranean strategy would be the best way to avoid unintended harmful effects of European de-carbonization efforts (such as the externalization of polluting agriculture production in the South, which increases food insecurity and the pressure on arable lands).

Thus, this Euro-Mediterranean integration would make green transition more effective at the global level, and contribute to reduce inequalities between both sides of the Mediterranean Sea, and within each country between rural and urban areas.

Food security issues are usually conceived exclusively under the prism of development policies. Integrating them within climate change policies would create a synergy among different fields.

The reform of food system should be built on local knowledge and existing practices, not by forcing innovations on farmers. Indeed, sustainable intensification of agriculture production needs to be context specific and location specific in order to succeed. A North-South cooperation involving public sector (especially scientific community, including social science), civil society and private sector is required in order to implement this bottom-up approach.



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1440 - Integrating Sentinel 1 Sar And Sentinel 2 Data To Estimate Soil Moisture For Irrigation Scheduling In Maize Fields Bronkhorstspuit South Africa

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A timely irrigation schedule is critical for optimising maize production, especially amid increasing droughts and climate change challenges. Maize, a staple crop in many countries, requires careful water management to maintain yields and promote sustainable agriculture. This study focused on Bronkhorstspuit, South Africa, a region with numerous commercial irrigated farms cultivating various crops year-round. It aimed to contribute towards an efficient irrigation scheduling approach for maize by estimating soil moisture accurately through integrating Sentinel-1 synthetic aperture radar (SAR) and Sentinel-2 optical data. The vegetation and soil moisture indices (e.g., MSI and NDVI), which represent crop health and moisture conditions, were analysed using Sentinel-2 images. Concurrently, polarizations (VV and VH) sensitive to soil moisture changes were obtained using Sentinel-1 SAR data. The study utilised an image fusion technique at the pixel level to integrate the SAR and optical data. A fully connected deep neural network (DNN) model was developed, using 80% data for training and 20% for validation, to capture complex nonlinear relationships and optimise the prediction of soil moisture. The results demonstrated strong correlations between soil moisture, leaf area index (LAI), and chlorophyll content, particularly during the V8 (eighth leaf) and R2 (blister kernel) stages. The integration of the datasets led to improved soil moisture prediction accuracy compared to using optical data alone, with relative root mean square error (rRMSE) values decreasing from 14.29% to 13.04% at the V8 stage and from 6.59% to 6.18% at the R2 stage. Polarization configurations influenced accuracy, with VH generally performing better than VV. Lower predictive performance was observed at both early (V3) and late (R5) growth stages, caused by shifts in canopy structure and plant physiology. Nonetheless, this integrated remote sensing approach offers a valuable tool for precision irrigation scheduling in maize fields, helping to optimise water use while sustaining crop yields. These findings support the adoption of smart agriculture technologies in the Global South and highlight the importance of satellite-based soil moisture estimation in advancing adaptive irrigation strategies that address agricultural challenges



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C24.01-African Studies => Migration, Regional Integration and Development



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1696 - Urban Resilience Perspective On International Immigration And Municipal Sustainable Development Planning In The City Of Umhlathuze South Africa

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Background

In South Africa, municipalities are increasingly faced with the dual challenge of managing rapid urban growth while ensuring that development is sustainable, equitable, and inclusive of diverse populations, including international migrants, in line with the ambitions of the United Nations Sustainable Development Goals 10 and 11. While global and national policy frameworks acknowledge the role of migration in shaping urban development, there is a lack of empirical evidence on the extent to which migration trends influence the resilience of local municipalities and how these trends are incorporated into long-term development planning processes.

Materials and methods

Drawing on both qualitative interviews with municipal officials and census demographic data from Statistics South Africa, as well as a document review, this paper, through the lens of urban resilience, analyses international migrant trends from 2001 to 2022 and their implications for the resilience of the city of uMhlathuze (South Africa). An assessment of how municipal planning practices are aligned with the migration-specific targets of SDGs 10 and 11 is included.

Results

The findings indicate that the migrant population in the city increased significantly from 4,392 in 2001 to 5,919 in 2011 but decreased to 4,736 in 2022, which could be attributed to the COVID-19 pandemic. More than 75% of international migrants in the city of uMhlathuze originate from the Southern Africa Development Community region, with approximately 63% being male. However, municipal officials and strategic documents indicate that international migration trends are not considered in municipal development planning, resulting in service delivery inefficiencies and challenges to urban resilience, which undermines the ambitions of SDGs 10 and 11.

Conclusions

Understanding migration trends and their implications for urban resilience is crucial for promoting inclusive, sustainable, and resilient urban development and enabling municipalities to effectively and proactively respond to demographic changes.



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C24.02-Agricultural Geography and Land Engineering => Agriculture's Contribution to Reaching Net Zero



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1297 - Agriculture's Contribution To Net Zero In Australia Carbon Sequestration And Bioenergy Cropping

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Background

Agriculture can contribute to net zero by reducing its own greenhouse gas (GhG) emissions (methane, nitrous oxide) through better livestock and fertiliser management, increasing carbon sequestration in soils and vegetation (soil carbon, agroforestry), adopting precision farming, using renewable energy, and shifting consumer diets towards lower-emission foods, all supported by technology, policy, and new carbon markets for offsets. This paper examines the response to this challenge of net zero in Australia where key practices include regenerative farming and increasing carbon sequestration by planting trees, and improving soil carbon. The federal government's Agriculture and Land Sector Plan (ALSP) aims to balance production with emission cuts, supporting farmers with technology and market opportunities to become leaders in low-emissions food, to form a crucial part of Australia's broader net zero goal to be reached by 2050.

Materials and Methods

The paper focuses on the content of the ALSP, for which an additional A\$1 billion has been allocated recently to boost climate resilience, productivity and support agriculture to be part of the net zero transition, in addition to A\$147.9 million already funding a dedicated research centre, a Carbon Farming Outreach Program and improved GhG emissions. The paper examines the adoption of key measures, including the gap between ambitious policy aims, the technical focus of research and development, and on-farm implementation.

Results

Take-up of initial carbon measures first implemented in 2011 is analysed and compared with projections for more recent schemes. In addition, the increase in adoption of bioenergy crops (including emerging options like carinata and oil mallees) and their spatial distribution is analysed using annual Agricultural Census data and sample farm surveys.

Conclusions

The economics of net zero at individual farm level will be crucial in ensuring that ambitious plans for key aspects of carbon sequestration and bioenergy are realised.



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1438 - Spatial Determination Of Sweet Potato Crop's Phenology And Growing Degree Days (gdds) Using Unmanned Aerial Vehicle (uav) Based Thermal Imaging

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Phenology assessment in Neglected and Underutilized Crops (NUCs) like sweet potatoes is critical for timely farm practice scheduling and necessary interventions. Growing Degree Days (GDDs), which quantify temperature accumulation over time, provide a reliable weather-based measure for predicting crop development and greatly enhance the accuracy of crop phenology predictions. However, the estimation of GDDs relies heavily on non-spatial Automated Weather Station (AWS) data, which may be located away from farms. This study evaluates the potential of the DJI M300 Unmanned Aerial Vehicle (UAV) equipped with a MicaSense multispectral- thermal sensor in estimating sweet potato phenology based on GDDs and spectral data. The UAV thermal data was collected at 34, 95, 143, 171, and 197 Days after Planting (DAP) and validated with field temperature measurements. The results indicated that UAV thermal sensors can reliably be used to estimate and spatialize GDDs and define sweet potato crop phenology. Using daily UAV-derived thermal GDDs, LSTs and multispectral indices, the results indicated that the growing stage of sweet potato crops occurs between 34 and 95 DAP, the stabilization phase from 95 to 171 DAP, and the maturity stage from 171 to 197 DAP. During the growing phase, daily GDDs and Land Surface Temperatures (LSTs) decline sharply, while vegetation indices (Normalized Difference Vegetation Index (NDVI), Green Normalized Difference Vegetation Index (GNDVI) and Soil Adjusted Vegetation Index (SAVI)) values increase rapidly, indicating rapid canopy development. In the stabilization phase, changes in daily GDDs and vegetation indices decline, and LSTs show moderate fluctuations, indicating canopy saturation and steady growth. During the maturity phase, all variables show slight declines, marking the beginning of senescence and reduced physiological activity. This study contributes to transformative methodological approaches to improve sweet potatoes crops phenological assessment.



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C24.02-Agricultural Geography and Land Engineering => Swidden Agriculture (Shifting Cultivation) and Tropical Forests: Their Sustainability, Dynamics, and Environmental/Socio-Economic Impacts



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1218 - Understanding The Persistence And Decline Of Swidden Fallow Forests Linking Proximate Drivers To Ultimate Causes Over The Long Term

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Background/Hypothesis

Swidden agriculture, once considered a major driver of tropical deforestation, is now being reevaluated, as recent research has shown its positive role in tropical forest sustainability, biodiversity conservation, and forest ecosystem services. Meanwhile, swidden fallow forests are rapidly being converted to permanent cropland and plantations due to the impact of the global economy. Factors determining tropical forest sustainability have changed historically, and it is necessary to examine these changes in long-term dynamics. However, such research on swidden agriculture is rare. This study examines the dynamics of the Majang, an ethnic group that has practiced swidden agriculture in the tropical forests of southwestern Ethiopia over the past 100 years, to elucidate the factors that have determined swidden agriculture and tropical forest sustainability and transformation.

Materials and Methods

This study combines literature written since the 1920s, analysis of aerial photographs taken in 1967, and the author's field observations since 1992 to elucidate the ultimate and proximate factors that have determined the persistence and change of swidden and tropical forests.

Results

The relationship between Majang and tropical forests underwent a major transformation following sedentarization in the 1980s. The ultimate factor behind this change was the shift from political disorder resulting from slave hunting to relative peace. Prior to sedentarization, fallow and primary forests were spatially separated and existed continuously. However, sedentarization triggered the spatial concentration of cultivated land and the expansion of permanent cultivation, and land grabbing became more severe due to the influx of immigrants from the highlands.

Conclusions

This approach will be useful for understanding the global changes that have occurred in tropical forest regions since the 20th century. By analyzing long-term dynamics, this study opens up the possibility of a universal understanding of the relationship between modern swidden agriculture and tropical forests.



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1374 - Diversity Flexibility And Monoculture In Swidden Fallow An Historical Geography Of Japanese Swidden Agroforestry

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Background/Hypothesis

Most of Japan's swidden fields or yakihata replaced by plantation forests by the mid-twentieth century. This paper argues that their disappearance was made possible by the ecological flexibility of swidden fallow periods. It is well known that one key feature of Japanese forestry is the development of cultivated forestry since the seventeenth century based on shifting cultivation. Reexamining local communities' relationship with crops, semi-domestication plants, and trees, this paper reevaluates the historical geography of the transition from swidden agriculture to cultivated forestry.

Materials and Methods

Using historical documents by local communities in the Kii Mountains of Japan, this study focuses on cases of conflict triggered by afforestation on swidden fallow sites to analyze the historical geography of the relationship between society and plants.

Results

Swidden agroforestry began in the seventeenth century at the latest with perennial trees including tea plants, lacquer trees, and paper mulberries cultivated in common swidden fields. During fallow periods, semi-domestication was established through the collection of warabi bracken fern or kudzu root starch, thatch for roofing, and broad-leaf trees for charcoal production. The cultivation of sugi cedar and hinoki cypress added timber trees for forestry to this diverse plant base. However, artificial forests occupying fallow periods for extended periods displaced the traditional semi-domestication plant use, creating friction within the community. This issue was resolved by returning profits from forestry to the local community.

Conclusions

Swidden agriculture promoted the natural growth of diverse vegetation and encouraged the semi-domestication use of plant resources. Cultivated forestry not only introduced new trees during fallow periods but also simplified the vegetation during these periods, significantly altering the relationship between society and the forest. The globalization of forestry that advanced in the twentieth century dealt a severe impact to Japan's mountainous population, whose forests had become simplified.



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1413 - Plantation Driven Livelihood Transition And Emerging Infectious Diseases Risk In Swidden Agriculturist Communities A Case Study In Southern Laos

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Background

Anthropogenic land-use change is a critical driver of the risk of emerging infectious diseases. In tropical Asia, rapid deforestation for commercial plantations (e.g., rubber and pulpwood) degrades ecosystems and may increase human-wildlife contact. This study investigated how such landscape transformations affect the livelihood patterns and nutritional status of swidden agricultural communities, thereby potentially altering the zoonotic pathogen spillover risk.

Methods

A comparative study (2017-2020) was conducted in two ethnically similar (Mon-Khmer) villages in Savannakhet Province, Laos: KL (encircled by external capital-funded plantations) and AN (with minimal plantation impact). We integrated mixed methods: GPS tracking of daily activity spaces, time-allocation surveys (recall method), geospatial mapping of shifting fields, anthropometric measurements (BMI), and dietary assessment via food diaries. Data were analyzed using ArcGIS Pro (Version 3.3) and R (Version 4.4.1).

Results

KL residents spent significantly longer hours on subsistence activities, particularly shifting field work, than AN residents. The mean distance to shifting fields was significantly greater in KL (1,295±680 m) than in AN (944±438 m) and had increased within KL since plantation establishment. While activity ranges were extensive in both villages, indicating a high potential for wildlife encounters, nutritional outcomes differed. The prevalence of malnutrition (BMI < 18.5) was notably high in AN (up to 48.1% among males) compared to KL (~25%). Diets in KL incorporated significantly more purchased and cultivated food.

Conclusions

Plantation development imposes spatial pressure, displacing agriculture farther from villages and increasing the residents' labor burden. This livelihood shift occurs in the context of persistent undernutrition and extensive human forays into forested habitats, where wildlife also face resource scarcity. The confluence of degraded ecosystems, stressed wildlife populations, undernourished humans, and frequent contact likely heightens the risk of zoonotic spillover, emphasizing the complex socio-ecological pathways linking land-use change to the emergence of disease.



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1423 - From Swidden To Oil Palm Exploring New Livelihood Diversification In Northern Borneo

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Introduction

Swidden agriculture has been predominant in the interior of Borneo; however, significant transformations in livelihoods are currently occurring due to the rise of plantation development. This presentation will examine the balance between changes in livelihoods and landscape transformations in the northern part of Borneo (Sarawak, Malaysia).

Diverse Livelihoods

The Iban people of Borneo are commonly associated with rice cultivation, often referred to as the “paddy cult.” However, this representation deserves deeper scrutiny. Interestingly, the labor time invested in swidden farming has been relatively low, and the introduction of chainsaws at the end of the 20th century has decreased this labor even further. Some researchers have characterized contemporary swidden agriculture as “the ultimate labor-saving farming.” This enables Iban men to dedicate significantly more time to hunting, gathering, and other subsistence activities than to swidden farming. In other words, Iban society is fundamentally shaped by a diversity of subsistence strategies, enabling the integration of various livelihoods beyond rice cultivation. Since the early 20th century, the Iban have not only introduced a range of cash crops, such as rubber, cocoa, pepper, and coffee, but they have also frequently engaged in wage labor outside the village.

Introduction of Oil Palm

Entering the 21st century, oil palm cultivation has been introduced among swidden farmers in northern Borneo. This is seen as an opportunistic choice for inland farmers who can adapt flexibly to changing livelihoods. Nonetheless, incorporating globally demanded commodities like oil palm requires careful consideration. Merely emulating corporate plantation practices may heighten various risks among swidden farmers. On the other hand, there is significant potential to maintain diverse livelihoods while generating cash income by creating a new mosaic landscape that includes oil palm.



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1507 - Monitoring Shifting Cultivation And Vegetation Dynamics In Tropical Forests Using Satellite Imagery

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Accurate monitoring of vegetation dynamics in tropical forests is increasingly important for forest conservation and carbon stock assessment. Although tropical shifting cultivation (swidden agriculture) is highly adapted to local environmental conditions, it is widely misunderstood and often portrayed as a driver of deforestation. This makes it essential to build reliable datasets that document land-use histories and vegetation dynamics. This study evaluates the usefulness of time series satellite analysis by comparing field based land use histories with satellite derived vegetation change in tropical forests of southwestern Ethiopia and Laos.

The study landscapes form a vegetation mosaic that includes active fields, short- and long-fallow secondary forests, mature forests, as well as areas that have shifted to permanent cultivation and plantations. We compiled ground-truth information from field observations and land use history records, complemented by high-resolution satellite imagery. For sites with reliable ground truth, we analyzed Landsat imagery (Landsat 5/7/8; since 1985; orthorectified and atmospherically corrected) and calculated NDVI and NBR to characterize temporal change, while accounting for seasonal variability.

Distinct temporal patterns in NDVI and NBR were detected across land use types and histories. NBR, in particular, showed strong potential to identify past burning and shifting cultivation cycles, and the timing of conversion to permanent cultivation was also identifiable in recently intensified areas. These results demonstrate that Landsat time series analysis can capture vegetation dynamics associated with different land uses in tropical forests, but reliable interpretation requires integration with local field information.



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2496 - Shifting Cultivation And Land Utilization In The Indigenous Village Of The Peruvian Amazon **Kazunobu Ikeya¹**

National Museum Of Ethnology, Geography, Suita-Japan ¹

Research on shifting cultivation in the Peruvian Amazon since the 21st century has been conducted from the fields of geography, economics, and agronomy. Studies have focused on migrant farmers' slash-and-burn practices, demonstrated low primary forest clearing using Landsat imagery and community surveys, and examined changes in fallow forests over recent decades. However, research addressing indigenous slash-and-burn practices remains limited. Indigenous communities have experienced diverse changes, including shifts toward cash crop agriculture, intensification of land use, and abandonment of slash-and-burn practices due to land scarcity. This study therefore aims to examine the maintenance and transformation of slash-and-burn practices by focusing on indigenous villages in the Peruvian Amazon rainforest. It does so by analyzing three aspects of land use: subsistence combinations, slash-and-burn techniques, and fallow land utilization. The author has intermittently documented the subsistence complex centered on hunting in the study village since August 2011. Specifically, short-term agricultural surveys were conducted in February 2019 and March 2023.

The results can be summarized as follows. First, the livelihood complex consisted of a combination of subsistence and commercial hunting and gathering, shifting cultivation, and livestock rearing—formerly cattle, now pigs. Regarding slash-and-burn techniques, the sequence was: felling and drying, burning and sowing, planting, weeding, and harvesting, followed by fallow land utilization. Furthermore, examining land use revealed that, based on a comparison of two farming households, each typically possessed about two small plots of farmland, each roughly 0.175 hectares, located within about 500 meters of their dwellings. While both households showed a common tendency to cultivate cassava and bananas in the first one to two years, one household utilized fallow land as a peach palm (*Bactris gasipaes*) forest. As described above, the indigenous village in this study shows no shift from shifting cultivation to settled agriculture, unlike migrant communities. Over the past decade, while residential concentration has increased in the study area, it is clear that traditional shifting cultivation persists. This is thought to be influenced by the fact that the study area is designated as a protected zone, restricting external migration.



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C24.04-Biogeography and Biodiversity => The World's Mountains in the Anthropocene



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1795 - Geographical Differentiation Of The Spitsbergen Mountains

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Spitsbergen, the biggest island of the Svalbard archipelago, is also distinguished by the dominance of mountainous landscape. This landscape is very diverse in terms of abiotic environment (bedrock, topography, glaciation). The island was named (in Dutch by Barents) after the jagged (“Alpine”) mountains along its western coast. These mountains are built of the old Precambrian and Paleozoic rocks. Karst landforms and processes occur within them in places. Table mountains with vast top plateaus are characteristic of the middle part and eastern coast of the island. These mountains are built of clastic Mesozoic and Cenozoic rocks. In the middle west, they are much higher (up to over 1000 m) than on the eastern coast (up to ca. 600 m). There are three altitudinal (climate-vegetation) zones in the Spitsbergen mountains: (1) tundra zone with vegetation which covers more than half of the ground surface, (2) sub-nival zone released from under the snow cover in the second half of summer, and thus with a very sparse vegetation, (3) glacial-nival zone (with accumulation parts of glaciers) where snow cover can last through the summer from spring to autumn. These zones are rising due to climate warming. Glaciers cover on average about half of Spitsbergen, occupying – mainly in the mountains – from ca. 10% of the area in the middle west (near Longyearbyen) to more than 80% in the north. All glaciers are currently in recession due to climate warming since the end of the Little Ice Ages (at the beginning of the 20th century). A completely new landscape is just being created in areas abandoned by glaciers (especially in the mountainous valleys and lower slopes). The new landforms, Quaternary deposits and water bodies are colonized by animals and undergo plant succession there. The nature of the Spitsbergen mountains remains mostly in its primeval state, untouched by men. The coal-bearing mountain slopes above the island’s settlements undergo rewilding. The mountainous landscapes of Spitsbergen is becoming more and more diverse due to climate warming, and therefore requires further investigations.



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2278 - Forest On The Move Assessing Potential Distributional Shifts Of Key High Elevation Tree Species Under Climate Change And Non Climatic Constraints In The Alborz Mountains N Iran

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Climate change is expected to drive shifts in species distributions, particularly in mountainous regions where steep elevational gradients create sharp climatic transitions. In the Alborz Mountains of northern Iran, the Hyrcanian forests form a relict temperate deciduous ecosystem characterized with high presence of *Quercus macranthera*, *Fagus orientalis*, and *Acer hyrcanum* at high elevations. Despite suitable climatic conditions extending above the current high-elevation forest edge, forests remain absent, suggesting that land use effects may limit distribution. Here, we applied species distribution models (SDMs) to evaluate potential future shifts of these three key tree species under SSP 1-2.6 and SSP 5-5.8 climate scenarios, incorporating both climatic and non-climatic variables (soil and topography).

Our results indicate that elevational shifts are the most pronounced response, with all species predicted to move upslope, potentially raising the high-elevation forest edge. Latitudinal and aspect-related shifts were minimal, highlighting that upslope movement is the primary mode of redistribution. While climatic variables, particularly maximum temperature of the warmest month and precipitation of the driest month, were consistently important, non-climatic factors such as soil pH and topography also strongly influenced potential distributions. Notably, the models predict climatically suitable conditions above the currently observed high elevation forest under present climate, indicating the position is influenced by additional non-climatic factors. These findings suggest that, although climatic warming may create suitable conditions for upslope migration, actual shifts are likely constrained by local edaphic and topographic factors. Overall, our study highlights the need to consider both climatic and non-climatic factors when predicting forest responses to climate change.



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2545 - Semi Domesticated Reindeer Pastoral Values Of Vegetal Communities In Scandinavia Ecological Preferences And Potential Future Distribution

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Subarctic mountains are highly impacted by the climate crisis. Livelihoods based on free-range pastoralism of reindeer, are exposed to borealization of tundra, more specifically to shifts of tree-lines. Direct effects of climate change (thawing-freezing, insect harassment, loss of pastures' quality due to borealization of vegetal communities) are inflating indirect effects of global change (intensification of forestry, mining, hydropower, urban sprawl). We seek to model impacts of climate change on tundra vegetal communities, that are important forage resources for reindeer during the thawing period. 55 vegetation surveys has been conducted along the montane tundra-taiga ecotone in which the Saami Gabna' community has seasonal pastures. Flora species' listed as well as biovolumes are classified using forage values as recognized by herders, reflecting reindeer needs, vegetation phenology and topo-climatology. A PCA is conducted on field dataset to quantify pastoral value of species. Using DEM, GBIF occurrences and CHELSA variables for present (1981-2010) and future (2081-2100, SSP5), we describe current abiotic values of the spatialized index, allowing to spatialize ecological niches for future, at a regional scale. A list of vegetal species positively and negatively correlated with each seasonal food value of reindeer pastures is obtained. The most significant statistical result has been obtained for the full summer season, that is also critical for reindeer demography. Vegetal species that are positively correlated with the summer food value have an artic-alpine range, while significant negative correlations are found for species with a Northern Europe native range. Highest food values are found where the summer is the coldest and the winter the driest, i.e. in the Scandinavian mountain range. For summer pastures in 2081-2100, an overall decreasing of pastoral resources is expected to decrease, mainly due to temperature increasing above 20°C. This confirms preexistent observations of changing structure and composition of subarctic montane tundras.



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2689 - Spatiotemporal Variability Trends And Elevation Dependence Of Daytime Nighttime And Compound Heatwaves In High Mountain Asia

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The present study examines the spatiotemporal variability, long-term trends, and elevation dependence of daytime (Tmax-based), nighttime (Tmin-based) and compound heatwaves over High Mountain Asia (HMA) during 1950-2024 using high-resolution ERA5-Land reanalysis data. Heatwaves were identified using a percentile-based framework that employed a sliding 90th percentile threshold, calculated separately for Tmax and Tmin on each calendar day, with a 15-day moving window (± 7 days) over the 1961-1990 reference period. A daytime (nighttime) heatwave is defined as when Tmax (Tmin) exceed its respective threshold for a minimum of three consecutive days. Whereas, compound heatwaves require simultaneous exceedance of thresholds for both Tmax and Tmin for a minimum of three consecutive days. Then, multiple metrics including the number of heatwave days (HWF), heatwave events (HWN), the duration of the longest event (HWD), amplitude (HWA), magnitude (HWM), and the length of the heatwave season were analysed using non-parametric trend methods (Mann-Kendall test and Sen's slope estimator) together with linear trend analysis. Results reveal widespread intensification of heatwaves across HMA, with significant increases across all metrics and pronounced acceleration post-1990. Additionally, nighttime heatwaves increased at higher rates than daytime heatwaves, likely due to reduced nocturnal cooling. Whereas, compound heatwaves, though less frequent, show the strongest relative amplification. Heatwave seasons have expanded by ~ 12 -14 days per decade (1950-2024) across HMA, driven by earlier onset of the first heatwave event and later occurrence of the last heatwave event. Finally, the study also reveals a strong elevation dependence of heatwave characteristics. Trends and mean of most heatwave metrics peak at ~ 4000 -6000 m AMSL over HMA and weaken afterwards at higher elevations. However, these elevation-dependent warming (EDW) patterns are not consistently observed within all sub-regions of HMA.



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2783 - How Do Climate Change And Human Pressure Affect Transformation Of Precipitation In Forests

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Background

Plants substantially affect water cycle in the moderate climate zone. The role of canopy in transforming precipitation is connected to the process of interception. In winter tree crowns accumulate snow and mountain areas gain additional water due to cloud water deposition.

Materials and methods

Meteorological conditions, precipitation, throughfall and stemflow were analysed in fir and beech forest plots in the Świętokrzyskie Mountains (SE Poland) in 2000-2024.

Results

An increase in air temperature was noted, with growing number of days with extremely high temperatures. The average yearly precipitation sum showed no significant trends. For both studied tree species, the throughfall could amount to over 200% of bulk precipitation in winter months, while in summer less than 50% of the rainfall reached forest floor. Conifers, with greater receptive area and assimilation organs present throughout the year, caused an increase in mineralisation of water passing through their crowns. The values of electrolytic conductivity were 2.3 times higher in throughfall and from 2.0 (beech) to 6.3 times higher (fir) in stemflow than in precipitation. Increased mineralisation resulted from brushing out air pollutants by crowns and the leaching effect – washing off mineral and organic substances from plant organs by acidified rainwater. The concentration of sulphur dioxide and nitrogen dioxide in the air at the study site decreases since the 1990s. It affects the physico-chemical properties of precipitation – increasing trend in the values of pH and decreasing for electrolytic conductivity are particularly visible in throughfall and stemflow.

Conclusions

Research indicates that the changing human pressure, including elevated deposition of acidifying substances, caused deterioration of forest health condition and acidification of soils. However, the monitoring shows that in the last 25 years air pollution with acidifying gases was decreasing, which was reflected particularly in chemical composition of throughfall and stemflow.



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C24.05-Climatology => Climate Justice: Territories, Actors and Processes



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2263 - Socioenvironmental Dimensions Of Urban Heat Islands In A Large City Of Northeastern Brazil
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This study investigates the spatial configuration of urban heat islands (UHIs) in Natal, a coastal city in northeastern Brazil, and examines their relationship with patterns of social vulnerability. Natal has approximately 750,000 inhabitants and exhibits pronounced socio-spatial inequalities. UHI modeling was based on an extensive field campaign, comprising ten months of air temperature measurements collected using a network of fifteen fixed thermometers distributed across the urban area. The Local Climate Zones (LCZs) were identified using the LCZ4r package in R, allowing for a detailed characterization of urban morphology and land cover. Following LCZ classification, the temperature records were spatially interpolated to represent the citywide thermal pattern. The analysis revealed that the intensity of the urban heat island frequently exceeded 4 °C between the warmest and coolest zones. Social vulnerability was assessed using data from the most recent national census at the census tract scale. An index was constructed from eight socioeconomic variables related to income, education, age structure, and race. Each census tract was categorized along a vulnerability gradient ranging from one (low vulnerability) to ten (high vulnerability). The integration of thermal and social datasets highlights a strong spatial correspondence between higher temperatures and areas of elevated social vulnerability. Highly vulnerable neighborhoods are characterized by dense occupation, limited vegetation cover, and a scarcity of public amenities such as parks and squares, conditions that favor heat accumulation. Conversely, areas with lower social vulnerability tend to feature wider streets, lower building density, and greater availability of green spaces, resulting in comparatively milder thermal conditions. Additionally, populations residing in the most vulnerable areas exhibit reduced adaptive capacity to extreme heat events, underscoring the urgency of targeted public interventions. By linking urban thermal patterns to social inequalities, this research contributes to the broader debate on urban climate justice and provides evidence to inform equitable urban planning and climate adaptation policies, particularly in cities of the Global South facing compounded environmental and social pressures.



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2475 - Scalar Struggles Scalecraft State Capacity And The Just Transition In Ireland's Transport Sector

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This paper examines the scalar tensions underlying the Irish state's efforts to pursue a just transition in the transport sector. Drawing on scholarship on the notion of 'scalecraft', I analyse how the Irish state seeks to coordinate across supranational, national, and local governance scales with a view to expanding inclusive planning and policy for electric vehicles (EVs), public transport, and active travel. I use 15 semi-structured interviews with policymakers and planners in Ireland's transport sector to highlight three key obstacles shaping these efforts. First, I show how a unique tendency toward centralisation within Irish statecraft limits the state's capacity to implement climate action reforms effectively. Second, I examine how historical processes of neoliberalisation have reduced local government capacity to assume responsibility for low-carbon reforms. Third, I explore how an emphasis on revenue-generating planning and development constrains coordination between local and national objectives. Overall, the paper argues that achieving a just transition requires more than engaging with marginalised groups, affected workers, or frontline communities. The just transition also depends on the state's capacity to craft and coordinate scale effectively. The dynamics of scalecraft in Ireland, therefore, raise critical questions about how states reorganise in response to climate justice, particularly in contexts shaped by neoliberal legacies that have redefined assumptions about the role and capacity of the state.



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2773 - Distinct Atmospheric Configurations Of The South Atlantic Convergence Zone Associated With Hydrometeorological Disasters

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The South Atlantic Convergence Zone (SACZ) is one of the main atmospheric systems affecting Brazil, accounting for approximately 25% of the total precipitation in the Southeast region between October and April (Nielsen et al., 2019). Its persistent activity favors the occurrence of extreme precipitation events, which may trigger disasters induced by hydrometeorological phenomena. In this study, 298 SACZ episodes were identified using the automatic methodology proposed by Zilli et al. (2019), complemented by atmospheric circulation variables at 250 hPa derived from ERA5 reanalysis. These episodes were subsequently associated with official records of hydrometeorological disasters for the period 1991–2023. The methodological approach combines statistical and spatial analyses to evaluate the correspondence between SACZ activity and disaster occurrence. Preliminary results indicate that, although SACZ episodes occurred on only 27% of the analyzed days, they were associated with 72% of the fatalities recorded during the study period. Of the 298 identified episodes, 229 were linked to disaster records, including 113 episodes with human losses, 14 with at least fifteen fatalities, and 69 episodes with no recorded impacts. The analysis of outgoing longwave radiation (OLR) reveals more intense negative anomalies during SACZ episodes associated with higher impact levels and fatalities, indicating enhanced and persistent convective activity. Additionally, these high-impact events are characterized by a marked intensification of the upper-level trough near Uruguay, suggesting stronger large-scale dynamical forcing and more favorable conditions for extreme precipitation over affected regions. The objective of this study is to investigate how distinct atmospheric patterns associated with the SACZ relate to the occurrence of hydrometeorological disasters. Specifically, the research aims to identify groups of SACZ episodes with similar atmospheric characteristics and classify them according to the severity and frequency of impacts, distinguishing events with more than fifteen fatalities, with fatalities, without fatalities, with disaster records, and without recorded impacts.



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C24.05-Climatology => Climate Variability in a Decade of Climate Change and Extremes in Mediterranean Basin



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1619 - Changes In Air Temperature And Precipitation In Croatia Based On The Köppen Climate Classification In The 1961 2020 Period

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Climate change is an aspect of climate that receives increasing attention from the scientific community, especially in those parts of the world where it has a major impact on numerous social and natural processes. Compared to the global mean, the increase in temperature is particularly pronounced in polar and mountainous areas, as well as in Europe, especially within the Mediterranean region, while changes in precipitation exhibit considerably greater spatial and temporal variability. The Köppen climate classification is often used to indicate climate differences between different periods, and its frequent use allows comparisons of different studies.

This paper analyses the changes in air temperature and precipitation based on the Köppen climate classification for the periods 1961-1990 and 1991-2020 using data from 29 meteorological and climatological stations in Croatia, whose coastal part belongs to the Mediterranean area. Changes in air temperature and precipitation and their impact on trends in climate type change according to the aforementioned classification were analysed.

Preliminary results indicated an increase in air temperature, especially in the summer months, leading to changes in the temperature features of summer. The increase in the frequency of hot summers has resulted in a shift from the humid temperate climate with warm summer (Cfb) to the humid temperate climate with hot summer (Cfa) in several stations. On the Croatian Adriatic coast, the summer precipitation shows a decreasing trend, resulting in the increasing prevalence of the Mediterranean climate type, i.e., humid temperate climate with hot summer (Cfa), which tends to shift to Mediterranean climate with hot summer (Csa). Although no major changes in the dominant climate types were identified at the analysed stations in the researched period, trend analysis indicates that in the future thirty-year period, there could be a major change in climate types, especially if the observed trends continue.



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2025 - Climate Change And Drought Problems In The Case Of Izmir (turkiye)

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The study area is the Izmir province, located in the Coastal Aegean Region of Turkey. With a population of over 4.5 million, Izmir is one of Turkey's important metropolitan areas, with its production in agriculture, industry, and service sectors.

Climate change and the resulting increase in extreme weather events, which are significantly affecting the Mediterranean basin and Anatolia, are also clearly felt in the study area. Among the most impactful extreme events are drought and related problems. This situation is characterized by a decrease in the number of rainy days and an increase in extreme rainfall amounts, while an upward trend is observed in monthly, seasonal, and annual temperature values. This situation, along with increased evaporation, leads to a decrease in surface and groundwater. As in the Aegean region, drought occurred in Izmir in the second half of the 1980s, the second half of the 2000s, and in 2020. Therefore, meteorological, hydrographic, agricultural, and socio-economic drought is becoming inevitable. Considering the population growth due to migration in the study area, a decrease in the amount of water per capita is inevitable. This situation has led to increased monitoring of dam fill rates and changes in groundwater levels. Therefore, the analysis of temperature data, which affects precipitation and evaporation – the most important components of drought – and the presentation of a projection have become crucial.

To determine the extent of drought in the study area, daily (max., min., average) temperature and daily total precipitation data from meteorological stations in İzmir city center and its districts for the last 50 years will be used. Using this data, daily rainfall amounts (normal, shower, heavy, and very heavy shower) will be categorized, and the number of rainless days will be determined using the Mann-Kendal method. Potential evaporation (PE) status, possible trends, and drought indices will be determined and evaluated separately for each region. The relationship between rainfall data, drought indices, and surface and groundwater will be assessed. Based on the findings, the report will include a general overview of the situation in the field, conclusions, and recommendations regarding possible measures based on emerging trends.



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C24.05-Climatology => Extreme Weather and Climate Events: Causes, Consequences, and Impacts



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1003 - Climate Mediated Changes In Seawater Chemistry And Their Potential Effects On Marine Lightning Intensity

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In 2016, the World Meteorological Organization declared that lightning is an essential climate variable. To date, global change studies have only considered the effect of warming on lightning flash frequency and the global distribution of lightning activity. Furthermore, none of these studies considered the effects of climate change on lightning flash intensity. In our previous studies we suggested based on laboratory experiments that lightning intensity over water surfaces may be influenced by their chemical properties, including salinity (S), pH and total alkalinity (TA). In this study we tested the combined effects of changes in S, TA and pH in Mediterranean Sea surface water on the intensity of laboratory generated electrical sparks, which are considered to be analogous to cloud to sea-surface intensity of lightning discharges. The range of values tested in the lab correspond to changes in S, pH and TA of Mediterranean surface water that were caused by the anthropogenic climate change, ocean acidification and damming of the Nile in the 1960s. Where, the damming of the Nile is generally accepted to have caused nearly 30% of the total salination of Mediterranean surface water until now. The experimental results were used to develop a multivariate linear model of Lightning Flash Intensity (LFI) as a function of S, TA/S, which and pH. The model was validated with wintertime (DJF) LFI measurements along a Mediterranean Sea zonal profile during the period 2009-2020 compared to corresponding climate model outputs of S, TA and pH. Based on this model, the combined effects of climate change, ocean acidification and the damming of the Nile, may have increased LFI in the Levantine Sea by $16 \pm 14\%$ until now relative to the pre-Aswan Dam period. Furthermore, assuming that salinization and acidification of the Levantine Sea will continue at current trends, the LFI is predicted to increase by $25 \pm 13\%$ by the year 2050.



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1104 - Southward Shift Of Western Pacific Tropical Cyclones Contribute To El Niño Decay

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The southward shift of anomalous westerlies from the equator to the south off-equatorial areas plays a crucial role in demising El Niño, and was attributed to seasonal changes in the large-scale environments in previous studies. Given that the southward shift exhibits a distinct spectral peak at the sub-seasonal timescale, we propose that it could also be caused by the seasonal meridional movement of high-frequency variabilities in the western tropical Pacific, such as the tropical cyclones (TCs). It is found that the TCs contribute to approximately 39% of the southward shift from October in El Niño years to the following March, which is significant at the 95% confidence level. Moreover, a reduction of TC activity could induce equatorial easterly anomalies over the western Pacific via enhancing the western North Pacific anticyclone, and thereby suppress El Niño. By estimating the relative vorticity associated with the western North Pacific anticyclone, we find that reduced TCs activity accounts for about 33% of variability of the western North Pacific anticyclone from November of the El Niño year to September of the following year. This reduction is primarily driven by decreased relative humidity at 600 hPa, with low-level vorticity changes playing a minor role. Our findings supplement dynamics regarding to El Niño decay, and imply the necessity of improving seasonal forecast of high-frequency variabilities for a better prediction of El Niño.



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1128 - Enso Predictability In Cesm Model From 1880 2017

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El Niño-Southern Oscillation is the prominent interannual signal in the global climate system with widespread climatic influence. As the most predictable climate signal and its profound impacts, ENSO also exerts the strongest predictability source for the global short range climate prediction. In the past few decades, enormous strides have been made in the ENSO prediction. However, uncertainties in initial conditions and imperfect model formulation limit the prediction skill of ENSO to some extent. In this study, we constructed the ENSO retrospective ensemble forecast from 1880 to 2017 with the CESM to evaluate the ENSO prediction skill and its variation in the framework of both the deterministic perspective and the probabilistic way. The results show that both the deterministic and probabilistic skills undergo coincidently interdecadal variation. The relative high skill occurs in the late of 19th century and after 1960s, while the relative low prediction skill occurs from 1900 to 1960. Moreover, the probabilistic skills are monotonic non-linear inherent to the deterministic skills, well following the theoretical relationship between the anomaly correlation coefficient and the reliability component. This is to our knowledge the first work to explore ENSO predictability using a long-term hindcast over 100 years of a complicated Coupled General Circulation Model.



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1609 - Climate Proofing Ilorin Metropolis In Northcentral Nigeria Evaluating Urban Planning Strategies For Climate Change Mitigation

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Climate change poses significant threats to urban areas, particularly in developing countries like Nigeria. Ilorin Metropolis, in North-Central Nigeria with its growing population and infrastructure and vulnerability to climate-related impacts have faced increasing climate-related risks in recent times ranging from frequency and severity of flooding events have increased, affecting infrastructure and livelihoods, rising temperatures exacerbating urban heat island effects and changes in precipitation patterns that has impacted water availability. This study evaluates urban planning strategies for climate change mitigation in Ilorin Metropolis with the following objectives (i) assess the vulnerability to climate-related impacts such as heat stress, water scarcity and flood (ii) evaluate the effectiveness of urban planning policies and frameworks (iii) assess Climate-resilient infrastructure design and implementation and (iv) assess the trend of landuse and landcover changes in Ilorin metropolis (1995-2025). Mixed method approach was employed for the study as Literature review, policy analysis, field observations, GIS mapping and spatial analysis were utilized for the study. The study findings identified climate-related vulnerabilities and infrastructure gaps, evaluated urban planning effectiveness in addressing climate-related risks and evidence-based recommendations for climate-resilient urban planning were developed. In conclusion. This study provides valuable insights into climate-resilient urban planning strategies for Ilorin Metropolis, informing policy and decision-making.



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1639 - Wintertime Heavy Rainfall In Southeast Asia

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Across global monsoon regions, heavy rainfall is typically confined to the summer season (June–September). In contrast, Southeast Asia also experiences severe wintertime heavy rainfall (November–March), which can lead to significant local damage. One contributing factor is that the western North Pacific is the only region where tropical cyclones can still develop in winter; these systems bring heavy rainfall when they approach or make landfall. Another factor is the frequent penetration of cold surges from the mid latitude Asian Continent into the deep tropics, where they interact with warm, moist air masses.

Yokoi and Matsumoto (2008, MWR) examined an early winter heavy rainfall event over central Vietnam and argued that the coexistence of a tropical depression like vortex and a cold surge flow is a necessary condition. Subsequently, Chen et al. (2012, 2013, 2015, JC) investigated the formation mechanisms of westward propagating cold surge vortices that trigger widespread heavy rainfall across Southeast Asia. In the Philippines, particularly over the southern island of Mindanao, heavy rainfall events are also common. Olaguera et al. (2021a, APJAS; 2021b, Nat. Hazards) analyzed the synoptic environments associated with these events and emphasized the role of shearlines extending from mid latitude frontal systems. Olaguera et al. (2022, in Extreme Natural Events, Springer) further highlighted the complexity of interacting weather systems that contribute to extreme rainfall in the region, and Olaguera et al. (2025) proposed an objective method for identifying such shearlines. Olaguera et al. (2023, IJC; 2024, ASL) also demonstrated the influence of the Madden–Julian Oscillation (MJO) on extreme rainfall events in the Philippines.

As such, wintertime heavy rainfall events in Southeast Asia stem from complex interactions among multiple weather systems, better understanding them is vital for disaster mitigation in this region.

Acknowledgements: This research was supported by JSPS KAKENHI No. 22H04938 and 24K00172.



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1645 - Data Rescue Of Japan's Instrumental Meteorological Records Since The 19th Century And Their Applications In Climate Studies

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This research aims to clarify the climatic characteristics of East Asia during the Little Ice Age (LIA) and to analyze long-term climatic variability from that period to the present era of global warming. Since the availability of official meteorological observations during the LIA is extremely limited, reconstructing past climate conditions requires the use of diverse alternative data sources.

This study focuses on the rescue, digitization, and analysis of historical meteorological data from Japan, as well as East Asia. These data include privately conducted instrumental observations dating back to the 19th century. Many of these records remain undocumented in official archives and are at risk of deterioration or loss. The systematic imaging and digitization of such materials—an activity widely known as Data Rescue—is therefore critical for expanding long-term climate datasets and improving regional climate reconstructions. These rescued datasets provide valuable insights into premodern climate variability and enable direct comparisons with modern instrumental records.

Currently, a collaborative project with the Seismology Laboratory at Harvard University is digitizing continuous paper-based thermograph and barograph records archived at the private observatory operated by Seikei University in Tokyo since the 1920s. These analog records are being converted into high-resolution hourly numerical data, enabling detailed analyses of short-duration climatic extremes, such as rapid temperature and pressure changes, as well as investigations of their long-term trends in frequency and magnitude.

This research demonstrates that Data Rescue of historical meteorological records in Japan can significantly enhance climate studies across temporal scales by bridging the gap between pre-industrial climate variability and contemporary climate change.



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2102 - Redistribution Of The Percentage Of Tropical Cyclone Energy In The Globe

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Tropical cyclone (TC) risk often varies with changes in the distribution of TC energy within and between basins. Little is known how global tropical cyclone energy is redistributed under global warming. By studying the contribution of individual basin TCs to the global TC activity, the study reveals the process of energy redistribution among different tropical cyclone categories. Results indicate that the distribution of accumulated cyclone energy (ACE) varies among the different tropical cyclone categories in a given basin. The percentage of the ACE in an individual basin has undergone significant redistribution over several decades□while the global ACE trend for all TCs is not significant, the trends of the global ACE across different TC categories favor a polarization, with an increase in ACE for TCs below or above the Hurricane category 1(C1). This polarization arises from the redistribution of each basin's percentage of global ACE over several decades. The decrease in global C1 ACE is primarily driven by the Western North Pacific (WNP) and Western South Pacific (WSP), while the North Atlantic (NA) contributes the most to the increase in global Tropical Storm (TS) ACE. The NA and North Indian Ocean (NI) jointly contribute to the increase in global ACE for tropical cyclones at and above Hurricane category 2 (C2-5). The changes in impact factors in specific basins during the active tropical cyclone season are further discussed in relation to those factors in other basins, and they are found to vary among the basins. Additionally, the models from the Coupled Model Intercomparison Project Phase 6 (CMIP6) show trends in the distribution of TC energy in the future.



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2176 - A 131 Year Evidence Of More Extreme And Higher Total Amount Of Hourly Precipitation In Hong Kong

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Based on the observations of hourly precipitation for 131 years from Hong Kong Observatory Headquarters, this study examined the long-term changes in the characteristics of hourly precipitation extremes in terms of intensity, total precipitation amount, duration, and frequency. Results show that the hourly precipitation extremes have significantly intensified by 29%–38%

from 1885 to 2022. The 131-year observations evidence that the more extreme the hourly precipitation is (i.e., higher percentiles), the faster the increasing rate it has. Specifically, the magnitudes of hourly precipitation with the 95th, 97.5th, 99th, and 99.9th percentiles increased by rates of 0.03 mm, 0.05 mm, 0.07 mm, and 0.12 mm per year, respectively. Through the secular trend analysis, we found that only the maximum intensity of extreme precipitation events (i.e., events with maximum intensity exceeding the 95th percentiles) shows a significant increasing trend during 1885–2022, while the trends in the total precipitation amount, duration, and mean intensity are not significant. However, by comparing the percentile bin values between three sub-periods of the 131-year record, we found a significant rise over time in the total precipitation amount, mean intensity, and maximum intensity of extreme precipitation events with different intensities (i.e., 95th, 96th, 97th, 98th, and 99th percentiles), while the change in the duration is not significant. The analysis of the frequency of precipitation events shows significant increases in the proportion of extreme precipitation events during 1885–2022. The observations of 53 stations across Hong Kong from 1986 to 2022 show significant intensification and increasing frequency in the hourly precipitation extremes in most areas of Hong Kong. Meanwhile, the precipitation duration shows a decreasing tendency, which may explain the insignificant changes in the total precipitation amount. These findings provide important insights into the longer-term variations in the characteristics of hourly precipitation extremes in Hong Kong.



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2332 - Linking Atmospheric Circulation To Temperature And Precipitation Extremes In Central Europe

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Understanding the atmospheric drivers of temperature and precipitation extremes in Central Europe is essential for improving climate risk assessment in a rapidly warming climate. This study develops and applies an integrated framework that links the detection of extreme events with their intensity, spatial extent, duration, and associated atmospheric circulation patterns. The framework is used to investigate extreme temperature and extreme precipitation events and their relationship to large-scale and regional circulation variability.

Using high-resolution gridded datasets for Central Europe covering the period 1961–2025, extremes are identified based on percentile-based thresholds and an event-based methodology that quantifies severity, affected area, and persistence. Atmospheric circulation conditions during extreme events are characterized using multiple classification approaches. Composite analyses and conditional probabilities are employed to assess circulation preferences and persistence during extreme conditions.

Results show that hot temperature extremes in summer are strongly associated with persistent blocking over Scandinavia and pronounced ridging over Central Europe, while cold temperature extremes in winter are linked to trough-dominated circulation patterns and enhanced meridional flow. Extreme precipitation events occur predominantly under cyclonic circulation regimes, with particularly strong associations to Vb-type cyclones and enhanced moisture transport from the Mediterranean. The spatial extent and intensity of both temperature and precipitation extremes are found to increase with circulation persistence.

Overall, the results reveal distinct and robust circulation fingerprints for different types of temperature and precipitation extremes in Central Europe. The proposed framework provides a physically consistent basis for interpreting observed extremes and offers a valuable tool for evaluating climate model performance and improving projections of future extreme events.



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2333 - Resilience To Mass Movement Phenomena Conditioning Factors In The Lower Suárez River Basin (santander) In The Face Of Climate Change

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Mass movement phenomena represent one of the main territorial threats in mountainous regions of Colombia, particularly in the lower Suárez River Basin (Santander), where complex geological conditions, steep slopes, intensive land-use transformation, and high precipitation regimes converge. Climate change, through increased climatic variability, higher rainfall intensity, and rising average temperatures, exacerbates processes of weathering, erosion, and soil saturation, thereby increasing the frequency and magnitude of slope instability events. In this context, territorial resilience depends not only on physical conditioning factors but also on the institutional capacity to integrate disaster risk management into land-use planning instruments. This study hypothesizes that a comprehensive characterization of conditioning factors, effectively incorporated into territorial planning, strengthens municipal resilience under current and future climate scenarios.

Materials and Methods

The research adopted a descriptive–analytical approach structured in two phases. The first phase involved a physical–geographic characterization of the lower Suárez River Basin, analyzing geology, geomorphology, slope gradients, land cover, and precipitation as the main triggering factor. Official datasets from IDEAM, the Colombian Geological Survey (SGC), SIMMA, and Corine Land Cover were processed using Geographic Information Systems (GIS). The second phase consisted of a qualitative assessment of institutional resilience through a systematic review of land-use planning instruments (POT, PBOT, and EOT) and municipal development plans from 50 municipalities, evaluating the degree of integration of mitigation and adaptation measures related to mass movement hazards.

Results

The results reveal pronounced territorial heterogeneity. While some municipalities exhibit well-structured risk management strategies, spatial identification of vulnerable areas, and coherent adaptation measures, a significant proportion show critical planning gaps, limited implementation of concrete actions, and weak intermunicipal coordination. Areas characterized by steep slopes, fractured geological formations, and reduced vegetation cover coincide with higher recurrence of mass movement events.

Conclusions

Resilience to mass movement phenomena in the lower Suárez River Basin is shaped by the interaction between physical conditioning factors and institutional capacities. Strengthening land-use planning, promoting intermunicipal cooperation, and integrating climate change adaptation criteria into territorial instruments are essential to reducing vulnerability and advancing toward more effective and sustainable disaster risk management.



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2398 - Extreme Climatic And Environmental Events – Another Proposed Classification

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Identifying extreme climatic and environmental events has been a hotly debated topic for a long time. There are many approaches to this topic in the world literature.

However, there is no universal, widely used classification, although several are most commonly used to create databases. These include e.g.: EM-DAT database, approach developed by Peril or European Severe Weather Database. This study presents a new classification concept for extreme environmental events, particularly emphasizing meteorological, hydrological and geomorphological phenomena. The scheme was developed for Central Europe but in many aspects can be applied for the entire temperate zone. Events are grouped according to their genetic origin. Capital letters denote the five principal categories identifying the immediate physical cause: M – meteorological, H – hydrological, G – geomorphological, O – oceanographical and X – other (including complex or poorly defined) environmental events. Within each category, types and subtypes are distinguished and all events are coded alphanumerically. The framework also allows the combination of two or more categories or types and can be further expanded or modified in the future. The list of particular events includes the most widely used statistical descriptors or probabilistic thresholds. Obviously, detailed criteria should be calibrated to local conditions. The vast majority of extreme events are caused by atmospheric phenomena, which are their most common trigger. It is difficult to identify extreme hydrological and geomorphological events that are not initiated by meteorological phenomena.



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2712 - Drivers Of Rapid Accretion In A Tropical Estuary A Case Study Of The Rokan River Estuary Eastern Sumatra Indonesia

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Rapid accretion in tropical estuaries builds tidal flats and enables vegetation colonization. It can drive mangrove expansion and rapid shoreline progradation. However, the drivers are hard to separate because watershed sediment supply and local sediment trapping act together. We examine these processes in the Rokan River estuary in eastern Sumatra, Indonesia. We quantify long term accretion and mangrove front changes, and we assess links to upstream forest loss and land use change.

We analyzed Landsat imagery from 1987 to 2024. We delineated shorelines and mangrove boundaries using a semi automatic workflow based on NDWI water and land separation, edge detection, and manual correction. We also conducted UAV surveys in 2024 and 2025 to map detailed topography at the seaward mangrove front. At the watershed scale, we compiled indicators of forest loss and land use conversion and compared them with periods of accelerated progradation.

Total land gain reached 170.4 □ over 37 years. The fastest shoreline advance occurred between 1995 and 2000. This interval overlaps with a period of pronounced forest loss in the watershed. Previous studies describe the Rokan River estuary as one of the largest accretion hotspots in Indonesia. In one coastal village, shoreline progradation averaged 360 m per year. A settlement that faced the sea in 1987 was located about 3 km inland in 2024.



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3254 - Vulnerability Assessment Of 2022 Flash Flood Using Geospatial Tools A Case Study Of Deh Kamanagar Sindh Pakistan

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Pakistan is considered as one of the most drastic impact of climate change. Pakistan, in spite of contributing slightly to global greenhouse gas emissions has faced its adverse impacts. The disastrous 2022 super flood highlighted that handling with climate change is not a matter of choice; it is an inevitable truth. For the current study, Deh Kamanagar located in District Dadu, of Sindh province in Pakistan. Projections from the Intergovernmental Panel on Climate Change (IPCC) and other sources show that Pakistan is supposed to face more heating, beyond the global average, escalating climatic variability and extreme events like floods.

For vulnerability assessment various data sources were used. The high resolution Digital Elevation Model (DEM) generated through drone was used as a base for the calculation of exposure. The flood intensity in the area was measured in the study using an HEC RAS model to compute the depth of flood water, water velocity and extent of the flooded area. Several scenarios were established and mapped for calculation of flood inundation affecting Deh Kamangar and its nearby settings. These Inundation scenarios were established using various precipitation regimes like 400 mm and 500 mm rainfall quantities over different durations i-e four hours, 24 hours, and five days in the model. These scenarios assisted in calculating the flood in probable inundation and understanding the cause and nature of floods in areas that were affected or are vulnerable to floods under numerous circumstances. The maps generated under these various scenarios indicated that breaches in the embankment were the principal cause of floods in the area, which was confirmed by both the model use as well as field investigation.



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C24.05-Climatology => Impacts of Climate Change and Human Sphere Adaptation



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1327 - Climate Change Trends And Sectoral Risks The Case Of Kobuleti Municipality Georgia

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Background / Hypothesis

An integrated understanding of climate change trends in Georgia and its regions is based on the analysis of Georgia's National Climate Change Communications (2015, 2020, 2024), meteorological and hydrometeorological observations, scientific publications, and institutional reports. These sources indicate that climate change poses increasing sectoral and health-related risks, particularly in coastal regions. The study hypothesizes that ongoing climatic changes significantly intensify environmental, socio-economic, and public health risks in the Kobuleti municipality.

Materials and Methods

The research is based on data from approximately 40 hydrometeorological stations, national climate assessments, and sectoral analyses covering agriculture, tourism, ecosystems, biodiversity, coastal zones, and human health. Observed climate trends were combined with future projections to assess sector-specific risks, with a focus on hydrological extremes and coastal processes in the Black Sea region.

Results

Since the mid-20th century, the average annual air temperature across Georgia has increased by 0.6–0.8°C, with projected warming of 1.6–1.7°C by 2050 and up to 4.2°C by 2100, particularly along the Black Sea coast. Annual precipitation in western Georgia increased by up to 14%, while projections indicate a decrease of 10–20% by 2100, accompanied by higher precipitation intensity. These changes are expected to increase the frequency of floods, flash floods, and coastal inundation, especially in the lower river basins of Kobuleti. Ecosystem responses include shifts in plant species distribution and the decline of cold-climate and relic alpine vegetation.

Conclusions

Climate change significantly amplifies sectoral and public health risks in the Kobuleti municipality. Reducing health impacts requires the development of local early warning systems, particularly for heat waves, integrated into municipal climate action plans and supported by real-time health risk monitoring. Regular monitoring of air, water, and soil quality and the integration of environmental and health data are essential for timely risk identification. Strengthening primary healthcare capacity, improving public awareness, and enhancing community-based monitoring mechanisms—especially during the tourist season and extreme weather events—are critical for protecting population health and supporting long-term socio-economic resilience.



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1403 - Use Of Indigenous Knowledge Systems For Climate Change Adaptation In Semi Arid South Africa

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Background: South Africa's semi-arid regions are undergoing accelerated warming and heightened climate variability, which collectively pose substantial challenges to marginalised agricultural communities. This study investigates the ways in which these marginalised communities in semi-arid South Africa adapt to the impacts of climate change, with a particular focus on the role of Indigenous Knowledge Systems (IKS). **Materials and Methods:** A systematic review was undertaken following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A Boolean search strategy was applied across three bibliographic databases—Web of Science, Scopus, and ScienceDirect—yielding an initial total of 1,086 records. **Results:** The analysis of the reviewed literature identified three key determinants shaping adaptation decisions: (1) socioeconomic conditions, (2) access to resources and services, and (3) the nature and extent of institutional support. Documented IKS-based adaptation strategies encompass indigenous weather forecasting, context-specific crop and livestock management practices, soil and water conservation measures, and various forms of social collaboration and collective action. The review further highlights several key barriers to effective adaptation, including financial constraints, limited access to appropriate technologies, and insufficient or poorly coordinated institutional support. The findings underscore that IKS are a significant component of community resilience to climate change. **Conclusion:** The study concludes that systematically integrating IKS into formal climate adaptation policies and programmes has the potential to substantially strengthen climate resilience in South Africa's semi-arid regions.



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1490 - Vulnerability And Resilience Exploring Companion Animals And Owners In Disasters In Urban Taiwan

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When exploring disaster-related issues, many studies focus on specific groups vulnerable to disasters, such as children, women, migrants, the elderly, the disabled, or the homeless. Due to a lack of autonomy or a relative deficit in capabilities, these groups are more susceptible to impact when environmental changes occur; thus, they are often regarded as the vulnerable subjects in disasters. This paper builds upon previous disaster research regarding vulnerable groups by incorporating non-human animals, specifically companion animals, and their owners as part of the vulnerable population, exploring their circumstances in disasters.

Discussing ‘non-human animals’ in disaster is not a new topic. As Hurricane Katrina in 2005, incidents involving the abandonment of companion animals, their separation from owners, or owners refusing to evacuate due to an unwillingness to leave their pets behind drew public attention to animal welfare and disaster prevention. This further led to the passage of the Pets Evacuation and Transportation Standards Act (PETS Act), which prompted deeper exploration of the emotional bonds and roles of non-human animals in human society, confirming issues of resilience and welfare for both pets and owners in natural disasters. Furthermore, the plight of animals during wartime has long been a key subject in animal history, particularly regarding military animals like horses or service dogs. However, in 2015, Hilda Kean’s research on the massacre of cats and dogs by Londoners during World War II shifted focus toward pets, highlighting the tension between love, resources, and ethics in human-animal relationships during wartime.

Focusing on the context of Taiwan’s disaster experiences, including natural disasters and wartime considerations, this study utilizes secondary data collection from newspapers and magazines, alongside participant observation in disaster-prevention workshops for shelter establishment. By organizing the trajectory of companion animals in Taiwan’s disasters from the onset of the disaster and rescue efforts to final displacement and sheltering, this paper aims to highlight the vulnerability of different types of companion animals and its causes. Additionally, it explores strategies and practices for building disaster resilience and discusses the implications and impact of establishing companion animal disaster-preparedness concepts within Taiwan society.



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1547 - Elevated Ultraviolet Radiation Adolescent Knowledge Gaps And Targeted Sun Safety Interventions

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Background

Despite the ozone layer recovering, ultraviolet radiation (UVR) in mid-latitudes remains elevated, and the frequency of days with elevated UVR (UV_{high}) increased, leading to increased daily exposure. In Serbia, the incidence of skin cancer increased, while mortality rates are among the highest in the world. To close the gap between high UVR levels and public awareness, it is essential to investigate the connection between knowledge and exposure behaviors, particularly among young people. This can help guide public health youth-targeted interventions, helping them to adopt and foster healthy sun habits and prevent harmful lifelong UV-exposure patterns.

Materials and Methods

The study analyzed (a) daily erythemal UV doses for Novi Sad, Serbia (1971–2018) reconstructed using ground-based measurements, a radiative transfer model, satellite ozone data, and cloudiness, and (b) responses from a 22-question multiple-choice cross-sectional online survey conducted among 1,222 high school students on UVR knowledge, attitudes, and exposure behavior. Statistical analyses used Chi-squared and Fisher's exact tests.

Results

The analysis showed that high mid-latitude UVR levels and increasing UV_{high} are mainly due to low cloudiness combined with low ozone. The survey indicated that most students had moderate to high knowledge, but an insufficient understanding of the sunburn risk associated with the UV index. Although many were aware of UVR hazards, 55.97% still favoured tanning. Most students (64.48%) reported significant sun exposure, particularly during summer vacations and weekends. Sun protection was infrequent; females used protection more than males, but often exposed themselves intentionally.

Conclusions

High UV doses and UV_{high} increase, coupled with low levels of adoption of protective behaviors among adolescents, represent a significant public health problem. The findings underscore the need for innovative, age-appropriate educational strategies and targeted awareness campaigns on skin cancer prevention and sun safety, tailored to specific age and gender groups. Campaigns should motivate females to reduce intentional sun exposure and males to adopt protection.



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1573 - Climate Change & Human Migration Toward An Integrated Framework Of Analysis

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The amount of research focusing on the links between climate change and population mobility has increased significantly in recent decades, but the geography of research shows a clear bias toward the Global South. Southern countries may face a higher climate change burden exacerbated by development inequalities, but the Global North is not immune. In Europe, the summers of 2024 and 2025 were punctured by fearful media headlines concerning Mediterranean countries evacuating populations due to floods and forest fires. Mountains also draw attention: approximately 300 people were, for example, pre-emptively evacuated from the Swiss village of Blatten (1540m.) due to a threatening landslide, which destroyed the whole village 9 days later. Considering that fast evolving context, the aim of this paper is to provide an overall framework that identifies the main climate change forecasts that could directly or indirectly affect mobility in Global North countries. The report is based on a research project financed by the International Organization for Migration (IOM). A typology will be proposed, identifying the environmental risks and their consequences on human mobility. It distinguishes between slow-onset and sudden-onset environmental degradations, and between short-term displacements and permanent migration. A further distinction is made between direct impacts (e.g. a population forced to move due to a landslide) and indirect impacts (e.g. economic migration due to the collapse of economic sectors due, for ex., to lack of snow). Possible “amenity” displacements toward cooler mountains regions are also included in the framework.



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1889 - Interrelated Hydrological And Climatic Variations In Northern Eurasia And Their Impacts On Terrestrial Environmental Changes Requiring Adaptation

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This study examines the complex interactions between hydrological cycles and climatic shifts in Northern Eurasia, emphasizing how atmospheric drivers—such as large-scale circulation changes—have triggered significant environmental cascades since the 2000s. Regional differences in temperature and precipitation have fundamentally altered the terrestrial water cycle, impacting permafrost stability, vegetation health, and river runoff. A critical finding is the role of prolonged, multi-year extreme events, exemplified by the 2004–2010 wetting period in Eastern Siberia. These events demonstrate that cumulative hydrological effects lead to nonlinear responses, including thermokarst formation and forest degradation, which single-year assessments often fail to capture.

Furthermore, the study highlights a precarious shift in climate feedback mechanisms. Northern Eurasia currently hosts vital negative feedbacks through its boreal forests and permafrost that mitigate warming; however, rising global temperatures risk deactivating these controls. The loss of such negative feedbacks could trigger uncontrolled positive feedback loops, accelerating Arctic amplification.

To address these challenges, integrating advanced ecohydrological models with remote sensing and satellite data is essential. Despite recent geopolitical and pandemic-related constraints on in situ observations in Russia, leveraging data-driven approaches and international archives remains a priority. Understanding these interrelated variations is vital for developing adaptation strategies and predicting the future of the Earth system, particularly within upcoming frameworks such as ICARP IV and IPY 2032–2033.



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2238 - Developing Measurable Targets And Response Indicators For Climate Adaptation In Germany's Building Sector

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Background

Currently, some European countries are seeking to regularly review the implementation of their climate adaptation efforts by setting measurable targets and monitoring progress. In Germany, the German Strategy for Adaptation to Climate Change (DAS) and the Federal Climate Adaptation Act (KAnG) provide the legal framework for this. Regular monitoring reports are published on developments. The DAS 'Buildings' field of action covers residential and non-residential buildings, including land and real estate. The key objectives of this field of action are to: 1) prevent damage to building structures; 2) reduce financial risks; and 3) protect users, particularly vulnerable persons. At least one indicator will be defined for each objective to measure its achievement, and this indicator will be reviewed regularly.

Materials and Methods

To ensure the DAS targets in the 'Buildings' field of action are measurable, indicators had to be developed. Additionally, the criteria, methods, data and tools required for setting targets, determining progress and measuring outcomes must be defined. If the basis for implementing the methodological proposal is lacking, it should be developed within the project framework as far as possible.

Results

The research project developed nine response indicators — three per target — and tested them for calculability. Every effort was made to ensure that existing (geo)data and information could be used wherever possible. The indicators include, e.g., the number of buildings occupied by vulnerable groups in designated flood zones, the proportion of shaded building sites, and the degree to which summer heat protection is implemented in the housing industry. The indicators are determined through statistical analysis, by cross-referencing various geodata or via AI-based analysis of remote sensing data. All indicators underwent scientific quality assurance through a specialist workshop and a review process involving experts from building sector.

Conclusions

The indicators developed highlight current opportunities for measuring progress in climate adaptation in the building sector. Following a decision by the federal institution, a nationwide calculation of the indicators including online presentation and their regular updating is planned. In an international context, information about the indicators developed is highly significant, as many countries face similar challenges. In addition, similar or coordinated indicators allow for cross-border comparisons.



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2627 - Quantitative Evaluation Of Windbreak Thickness Required For Effective Wind Protection Using A Wind Tunnel Experiment

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Shelterbelts comprising trees surrounding farm fields and residential areas have long been utilised in the windy plains of Japan to mitigate wind hazards. In addition to stabilising agricultural production, these shelterbelts are believed to protect the living environment within rural settlements.

This study examines the wind-breaking effectiveness of traditional Japanese shelterbelts through multiple approaches. First, long-term observational data from nearby meteorological stations were analysed to assess the frequency of strong wind events and changes in prevailing wind directions. The analysis revealed no significant trends in strong wind days or mean wind speeds attributable to climate change, indicating persistent wind exposure in the study region.

Secondly, we compared villages with continuous shelterbelt cover to villages where parts of the shelterbelts had been removed. The comparison shows that under strong wind conditions with near-surface wind speeds of approximately 10 m/s, settlements with intact upwind forest cover exhibited clear wind reduction effects, whereas those with interrupted shelterbelts did not demonstrate sufficient protective performance.

Motivated by these findings, the next research objective was to identify the scale of shelterbelt necessary to exert effective wind reduction under anticipated wind conditions. Wind tunnel experiments were conducted using scaled physical models of bamboo-like vegetation. The number of rows of model vegetation was varied in a stepwise manner (1, 2, 4, and 8 rows), and vertical wind speed profiles were measured at each configuration. From the acquired data, friction velocity was calculated as an indicator of near-surface wind momentum and used to quantify the relationships between shelterbelt row count, protective effectiveness, and wind speed characteristics.

The results provide quantitative insights into how shelterbelt thickness influences wind reduction performance, which has implications for rural landscape design and wind hazard mitigation strategies.



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2730 - Assessment Of The Vulnerability Of Tropical Coastal Natural Anthropogenic Ecosystems To Climate Change For The Development Of A Nature Management Adaptation System

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Coastal regions are characterized as being among the most dynamic, highly productive, and concurrently, the most susceptible landscapes on Earth. This inherent susceptibility is maximized within the tropical biome. These coastal zones represent delicate, complex dynamic systems facing escalating threats due to the combined effects of anthropogenic stress and climatic alteration. Critically, tropical coastal ecosystems are central to the global carbon cycle, function as indispensable natural buffers against storm surges, and provide essential habitat for a substantial fraction of global biodiversity.

The aim of this research is to investigate the response of tropical coastal ecosystems to global climate change and to develop a fuzzy logic-based decision support system for minimizing the adverse effects of climate change. As a result, a methodology will be developed and implemented as a digital tool, enabling an integrated assessment of the geo-ecological status of various tropical coastal ecosystem types. This methodology will be incorporated into a broader nature management optimization system founded on fuzzy logic principles.

The study identified responses of coastal natural-anthropogenic ecosystems to climate change, including the influence of various factors on land cover type dynamics. Soil loss projections and forecasts for erosion process development were constructed, along with assessments of flood risk potential associated with climatic shifts and increasing anthropogenic pressure. As a result, a methodology for the geoecological assessment of tropical coastal ecosystems was developed. The criteria underpinning this methodology were substantiated, based on remote sensing data and geoinformation modeling (encompassing climate change, ecosystem response parameters, atmospheric air pollution, anthropogenic transformation, population density and dynamics, among others). An evaluation of the selected criteria was performed, and integrated maps of the geo-ecological status of selected key sites under conditions of climate change were generated.

This work was carried out within the framework of a scientific project “Assessment of vulnerability of coastal ecosystems in the tropical zone to climate change for the purpose of adapting of governance nature management” and funded by MSHE of RF (Agreement No. 075-15-2024-657), by NRF of South Africa, CNPq of Brazil under project No. 440048/2024-9.



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C24.05-Climatology => Smart Cities and Climate-Sensitive Infrastructure



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2414 - Urban Thermal Perception And Adaptation Strategies Under A Warming Climate

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Thermal comfort showed apparent differences under the varied climate backgrounds. This work presented a comprehensive review of human thermal comfort indices, quantification method and climate difference across the globe both in outdoor spaces and indoor environments. We found that more than 50% of the total studies were focused on temperate regions, particularly in China, India, and the United States. We summarize thermal index application and the method of thermal comfort benchmark quantification, finding that the misunderstanding of benchmark terms and inappropriate alternative calculations lead to results bias. We unify the heat index to analyze thermal benchmarks across different climate zones. The result is that tropical moist had the highest neutral temperature and snow climate had the lowest neutral temperature. Tropical moist climate and arid climate region showed similar outdoor neutral temperature in summer, while significantly difference in winter. Indoor neutral temperature had little difference between the temperate climate zone and the cold zone climate zone in summer, but an obvious difference existed in winter. The thermal tolerance values were closely correlated with the extreme temperatures in different regions. The cooling effect of green roof, green space, green irrigation and spraying in different climate zones were discussed and we suggested the choice of adaptation strategies.



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2509 - Comparative Study Of Land Use Cover Change And Urban Heat Island Patterns In East Asian Megacities

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Scenario-based land use simulation provides an effective framework for understanding long-term urban thermal dynamics under different development pathways. This study examines the relationship between land use/cover change and Urban Heat Island (UHI) intensity in four major East Asian metropolitan regions: the Tokyo and Osaka Metropolitan Areas in Japan, and the Beijing and Shanghai Metropolitan Areas in China. Land use/cover and land surface temperature maps derived from Landsat imagery for 1985, 2000, 2010, and 2022 are used to analyze historical spatiotemporal patterns of urban expansion and thermal variation. The results reveal distinct urban thermal responses across the four metropolitan regions. Tokyo and Osaka exhibit relatively stable UHI patterns, with high-temperature zones largely concentrated in dense urban cores and moderated by green spaces and coastal influences. In contrast, Beijing and Shanghai show more pronounced spatial expansion of heat islands, closely associated with rapid urban growth and the conversion of vegetated and agricultural land into built-up areas, particularly after 2000. The relationships between land use composition, spatial configuration, and UHI intensity are further investigated through analyses of urban core–suburban contrasts, isothermal patterns, and three-dimensional urban indicators such as floor area ratio and building volume. Scenario-based simulations for 2030 and 2050 suggest that compact and environmentally oriented land use strategies can effectively mitigate future heat stress, especially in rapidly expanding metropolitan regions. This study provides comparative insights into climate-adaptive urban planning and supports sustainable development strategies in East Asian megacities.



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C24.05-Climatology => Urban Climate



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1383 - Why Cities In Serbia Struggle With Air Pollution The Nexus Between Residential Building Typologies And Air Pollution

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Air pollution is a significant environmental and public health concern in Serbia, affecting most urban residents, mainly due to high levels of particulate matter (PM). The situation worsens in winter, when PM₁₀ and PM_{2.5} levels often surpass both the WHO-recommended upper levels and national standards. According to the inventories, district heating plants with capacities below 50 MW and individual household heating constitute the dominant sources of pollution, jointly accounting for more than two-thirds of total national emissions. This is compounded by the widespread use of low-quality fossil fuels and obsolete energy production technologies.

Spatial conditions additionally worsen pollution exposure. Many affected cities are located in valleys and basins, where topography, combined with emissions, increases pollution due to poor airflow and longer retention of pollutants at ground level. For the period 2019–2023, the highest average PM₁₀ concentrations during the heating season (November–April) were recorded in Valjevo (79.27 µg/m³), Zaječar (77.20 µg/m³), and Užice (73.20 µg/m³), while the highest PM_{2.5} levels were observed in Novi Pazar (63.56 µg/m³) and Valjevo (53.86 µg/m³).

This study investigates these patterns in the context of ongoing urban expansion, with particular attention to suburban residential zones that lack adequate infrastructure. In these areas, a prevailing share of dwellings relies on individual heating appliances, predominantly fueled by wood and coal, while low chimney heights contribute to the accumulation of pollutants near the ground. Using an integrated and interdisciplinary approach, this study combines data on air quality with information on residential building typologies, infrastructure coverage, heating systems, and settlement morphology in cities with the highest observed PM concentrations. The results underscore the need for spatially differentiated mitigation strategies that integrate urban development, energy efficiency, and environmental measures to enhance living conditions and reduce health risks.



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1388 - Urban Air Quality In Serbia No_x Concentrations And Meteorological Drivers

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One of the air pollutants with significant negative effects on public health and the environment is nitrogen dioxide (NO₂). Elevated levels are primarily found in urban areas and are associated with emissions from road traffic. In Serbia, energy production, traffic, and industry are the primary sources of nitrogen oxide emissions. This study offers an assessment of the situation based on NO₂ monitoring over a ten-year period. Additionally, the role of meteorology in observed concentrations was examined.

The verified daily time series for 21 monitoring stations in the urban area, spanning from 2011 to 2020, were analyzed. The distribution of daily, seasonal, and annual values, as well as extreme events, was analyzed in the context of the station type (traffic, background, and industrial). The contributions of meteorological factors (air temperature, wind parameters, air humidity, and air pressure) were evaluated using a boosted regression tree.

The highest average daily concentrations were found at traffic stations (up to 44.44 µg/m³ at the Belgrade Mostar station) as well as background stations in the largest urban areas (up to 36.87 µg/m³ at the Belgrade Vračar station). These stations have the highest number of days exceeding the WHO-recommended upper limit of 25 µg/m³ for daily values. Concentrations are higher in winter months compared to summer months, with an estimated influence on variability of up to 20.9%. The model performs well (up to R²=0.85), with relative humidity having the greatest estimated effect on daily concentration distribution (up to 15.3%), followed by wind speed and direction.

The results emphasize the need for more effective planning measures to reduce emissions in urban areas in Serbia. These should focus on emissions from road traffic, as well as the production of electrical and thermal energy sector, which is particularly reflected in peak concentrations during the winter months.



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2570 - Analysis Of Urban Air Pollution Using Sentinel 5p Data In Greater Yola Adamawa State Nigeria

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Urban air pollution has emerged as one of the most pressing environmental challenges of the 21st century. Rapid urbanization, industrial activities, and increased vehicular emissions have led to deteriorating air quality in many metropolitan areas worldwide. Understanding the dynamics of urban air pollution is crucial for developing effective mitigation strategies and protecting public health. This study utilizes Sentinel-5P data to explore the spatial and seasonal patterns of urban pollution, focusing on nitrogen dioxide (NO₂), ozone (O₃), and particulate matter (PM_{2.5}) across Greater Yola, Adamawa State, Nigeria. The pollution data were downloaded from the Copernicus Open Access Hub for the year 2025 and grouped by season. Urbanization indicators, including population density, road/traffic density, and industrial activity, were generated using secondary data. Spatial analysis (visualization), hotspot analysis (using the Getis-Ord Gi* statistic), and correlation analysis were employed. The analysis reveals distinct spatial patterns in the distribution of NO₂, O₃, and PM_{2.5} across the study area. High concentrations of NO₂ are observed in areas with heavy traffic and industrial activities, highlighting the impact of transportation on air quality. Conversely, O₃ levels tend to be higher in suburban areas, where sunlight and precursor pollutants facilitate the formation of O₃. PM_{2.5} concentrations exhibit a more complex distribution, influenced by both local emissions and meteorological conditions. Seasonal variations are evident, with higher NO₂ levels during the wet season attributed to increased human activity and stagnant atmospheric conditions. O₃ levels, on the other hand, peak during the dry season when sunlight is abundant, facilitating photochemical reactions. The analysis suggests that urban planning plays a critical role in shaping air quality. Mixed-use developments that integrate residential, commercial, and recreational spaces can reduce reliance on vehicles and promote cleaner air. By considering the interplay between urban design and pollution, cities can adopt more holistic approaches to air quality management. The findings reveal distinct spatial and seasonal variations in air quality, highlighting the influence of urban activities on pollution levels. By leveraging satellite technology, this research contributes to a deeper understanding of urban air quality dynamics and offers valuable insights for policymakers seeking to mitigate pollution.



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**C24.08-Cultural Geography, Society and Heritage
=> Artistic, Cultural, and Creative Practices and
Initiatives ‘On The Edge’: Beyond The Core–Periphery
Divide**



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1079 - Rural Community Empowerment And Agency Through Improvisation Theatre The Improlands Project

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Rural and remote areas in Europe, as elsewhere in the world, suffer from rapid depopulation and aging, leaving their few residents to face severe challenges and feelings of isolation and loneliness. Various crises, ranging from natural disasters to socio-economic stagnation and political upheaval, further exacerbate those challenges. In a concerted effort to alleviate the conditions of selected rural communities, an international group of performing artists activated and facilitated local and transnational art-based activities, with a special focus on improvisation theatre, in small rural communities in Italy (Marche region), Spain (Segovia), Romania (Transylvania), and Greece (Thessaly), suffering at the aftermaths of earthquakes, floods and socio-economic crisis. Data collected through participant observation during the artistic process, semi-structured interviews, and focus groups with residents, as well as questionnaires answered by artists and audiences of the art events presented, have shown positive results. The initiative proved particularly effective in terms of raising solidarity and co-creation among the communities and in empowering self-agency, enriching the narratives of those geographies of abandonment. Furthermore, besides highlighting the promising conclusions, this presentation addresses the question: What are the opportunities and limitations of artistic intervention in affected communities? The challenge to sustain long-term art-based activities in rural communities and, more importantly, to gradually pass on the leadership and authorship to the communities remains as the future aim of the consortium.



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1240 - Rethinking Creative Geographies Peripherality And The Spatial Dynamics Of Creative Professionals In Poland In The 21st Century

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Background: Numerous studies and policy frameworks focus on cultural and creative industries in urban environments. However, there is a growing body of research examining creativity in ‘peripheral’ areas. Their real and perceived remoteness, limited accessibility, low population density, and lower levels of socio-economic development (Novotný et al. 2015; Pugh & Dubois 2021; Churski et al. 2024) appear to constrain opportunities for creative practices, which tend to thrive in network-rich urban clusters and benefit from large metropolitan markets. However, peripheral areas may offer attractive conditions, such as lower living costs, community embeddedness, natural amenities, and tranquility conducive to creative work, both for long-term residents and for professionals who choose to relocate, also thanks to recent developments in digital technologies (Hautala 2015; Bürgin et al. 2021; Costa & Lynch 2021; Mathisen et al. 2024; Silva et al. 2024). The aim of this study is thus to identify spatial patterns of creative professionals in peripheral areas and examine their dynamics in the first quarter of the 21st century. We hypothesise that while the number of creative professionals in peripheral areas has relatively increased, their presence remains concentrated in a limited number of specific peripheral regions.

Materials and methods: The study uses data from the Polish national censuses of 2002 and 2021 to identify the distribution and changes in different categories of creative professions across all peripheral LAUs in Poland.

Results: The analysis identifies several peripheral regions in Poland with a relatively high presence of creative professionals. It also reveals categories of creative professions that have shown a stronger shift towards peripheries between 2002 and 2021.

Conclusions: Peripheral areas differ substantially in terms of the presence and composition of creative professionals. Findings from this quantitative analysis provide a basis for further in-depth qualitative research in selected regions, aimed at a better understanding of peripheral creative ecosystems and more informed, context-sensitive policy approaches.



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1386 - From 'birthplace' To 'heritage Site'. Commemorating Italian Renaissance Artists In Public Space. Cases Of Vinci And Urbino Italy

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Italian Renaissance artists, both in their work and in their pseudonyms, often emphasised connections to their place of birth or upbringing, treating these locations as an important element of their identity. Today, we are seeing the opposite phenomenon – cities are increasingly pointing the connections out with artists, using their cultural legacy to shape urban space. The aim of this presentation is to show the various forms of commemoration of two Italian Renaissance artists (Leonardo da Vinci and Raphael Santi) in the public space of their birthplace towns and how narratives about the artists function in the towns' promotion and image strategies.

The study is based on the hypothesis that memory of artists is visible in public space in tangible and intangible dimensions, and both these dimensions are used in developing strategies to promote and shape the image of these towns. Source and field research has made possible to identify places, events and things associated with artists and recognize their usage in promoting and shaping the image of towns.

Research showed, that museums dedicated to artists are the main place where towns connect with artists. In addition, numerous urbanonyms appear in towns, and image of artists are used in the creation of souvenirs. Case studies also showed that 'birthplace' and 'heritage site' are not separate categories, but interweave to form a complex network of meanings in which artists' cultural legacy can be a factor in the development of contemporary urban space.

The heritage of artists can be treated as a town brand and serve for promotion, identification and tourist communication, while the image of an artist can act as a unifying force – connecting historical space, cultural offerings and tourist products.



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1711 - Walking Art In Prespes Greece How A Borderland Landscape Generates Translocal Community Based Practices

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This paper examines the Visual March to Prespes as a long-term walking-based artistic initiative located in the borderland of Prespes, Greece, demonstrating how a peripheral landscape can generate translocal, community-based creative practices. Active since 2007, the Visual March has activated walking as an artistic, pedagogical, and community-oriented practice through which landscape, local history, memory, and community life are collectively explored while establishing networks that extend beyond the local scale, connecting Prespes to broader artistic, academic, and cultural circuits. Drawing on ethnographic documentation, participatory observation, archival material, and published documentation of the Visual March, the paper analyses how walking transforms a remote geopolitical landscape into a site of cultural production and social interaction that challenges assumptions about artistic activity as urban-centred. The borderland landscape—shaped by migration, ecological vulnerability, and geopolitical transitions—plays an active role in activating embodied experiences and producing forms of community-based practice that are simultaneously grounded in local histories and open to translocal exchange. By engaging with recent research on arts and culture in rural areas (Kroismayr et al., 2025), walking as arts-based practice (Mueller, 2023), and community empowerment through design (Schouten et al., 2024), the paper contributes new insights into how creative initiatives can thrive outside metropolitan cores, fostering cultural production, community engagement, and collective spatial imagination.



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2184 - Outside The Mainstream. Street Art As A Form Of Expressing Social Attitudes. A Case Study Of The Centre Of Warsaw

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In urban space, numerous forms of manifesting attitudes and ideas can be observed. Among the most conspicuous are mass demonstrations; however, various forms of street art are also frequently encountered. This second group - artistic interventions - was the focus of this study. The main objective of this research was to identify and analyse the themes of works documented in the centre of Warsaw. In relation to the topic of the session, the very centre of the Polish capital can hardly be considered a peripheral area. Nevertheless, the chosen research site is characterised by significant contrasts, including aesthetic aspects. Modern, well-maintained buildings coexist with left-behind structures and spaces. In the context of this study, peripherality can also be considered in terms of the noticeability of the analysed artistic works, as well as their subject matter. While some works in the inventory reflect mainstream attitudes and themes, others address issues that are marginalised or rarely represented in public space and discourse. The research was based on a two-phase field inventory conducted in a selected section of the very centre of Warsaw. These inventories included photographic documentation and geotagging using the Map Marker application. Each work documented in the inventory was first classified according to its artistic form, and subsequently allocated to broader thematic categories established by generalising the specific subjects represented in the works. Stickers were found to be the most prevalent form, although paste-ups, stencils, murals and graffiti were also observed. The works documented within the research site covered a diverse range of themes, including social and political issues such as workers' and tenants' rights, women's rights, opposition to discrimination and violence, environmental concerns, and matters related to the local political scene.



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2244 - The City As Canvas Art And Advertising In Warsaw's Urban Space

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In the public space of Warsaw (Poland), walls have turned into contested surfaces where art and advertising compete for attention. In recent years, large advertising agencies have increasingly commissioned commercial murals for the most prominent facades. This expansion reshapes the city's visual identity, redefining what is seen as public art, and raises an important question: what kinds of art remain on the margins when the centre becomes a hybrid space of art and commerce?

This paper examines how economic factors, visibility, and access to walls in public space influence where and how different types of murals appear. The research combines field inventory, spatial mapping, photographic documentation, and interviews with mural artists and advertising professionals. Through this research, the author demonstrates how artists respond to the dynamic conditions of artistic work in the city and how the relationship between art and commerce is shaping Warsaw's public space today, pointing to the factors that influence the presence of art in the city.

In the course of the study, a clear tension within the artistic community became apparent regarding the growing presence of commercial murals. While some artists perceive such collaborations as a necessary form of professional adaptation, others regard them as a threat to the integrity and autonomy of artistic practice. At the same time, advertising agencies are facing increasingly strict regulations on outdoor advertising in Polish cities, which directly affects the availability of large mural surfaces. Consequently, many artists are exploring alternative modes of expression in public space – turning to smaller-scale interventions, independent projects, and collaborations with public institutions.



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2630 - The Impact Of Culture On The Rural Development Overcoming The Rural Divide In Terms Of Access To Citizenship An Exploratory Study In The Province Of Cuenca (spain)

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A review of the most recent bibliographical contributions on the relationship between Culture and Territory could lead to the hypothesis that culture would play a key role in the policies of sustainable territorial development and the demographic challenge, to which the Spanish Ministry of Culture and Sport is added through the Culture and Ruralities sub-programme. The aim of the aforementioned sub-programme is to enhance the image of the rural areas, to promote the social, environmental and heritage resources of the territory and to guarantee equal access to and participation in cultural life, regardless of place of residence, an essential right for the development, coexistence and social cohesion of the rural world. Based on this rationale, we have set ourselves the objective of an exploratory investigation of the initiatives and projects of cultural innovation in Cuenca (Spain) using a mixed methodology that combines the review of available information and the case study method as an alternative approach following qualitative methods. The objective is to identify and analyse socio-demographic impacts in several areas: demographic, economic, personal well-being, and reputational at both municipal and regional scales.

The first conclusions drawn seem to prove that there is unanimity in considering that the impacts receiving the highest ratings are reputational and those related to personal and community well-being, i.e. qualitative effects of an intangible nature. While the tangible effects -demographic and economic- show greater disparity and deviation depending on such varied aspects as the institutional framework behind the project, the project design, the programme and the budget.



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2709 - Aesthetic Analyses For Understanding Contemporary Peripheral Metropolitan Spaces In São Paulo And Their Transformations

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Recent transformations in contemporary society are reflected in the shifting behaviors of youth and the modulation of their collective and individual interests across the various spaces they inhabit, including the peripheral contexts of large metropolises. Increasingly exposed to a growing plurality of visual stimuli—particularly through social media—these young individuals constantly demand new strategies and approaches for a critical reading of a world in flux, consistent with the realities experienced in the various spaces that constitute their personal and collective references.

Through empirical research involving youth groups in educational settings, this study examines consumption habits that engage with local and regional peripheral references of São Paulo's urban culture. These habits are expressed through distinct codes that underpin the territorially lived culture of these youths. This approach aligns with the geographical concept of the psychosphere, developed by Milton Santos (1996), which enables a critical analysis of images within space and the decoding of a specific visual language in a world where images increasingly exert political power and influence over collective social subjectivities.

The objective of this work is to analyze and map how the construction of the cultural repertoire of urban youth and their peripheral references—as well as the production and consumption of contemporary urban landscapes and aesthetics—structure their surrounding spaces. This process fosters new relationships with public life and other societal spheres by transforming the use and collective aesthetic perception of peripheral spaces in large Latin American metropolises such as São Paulo. These transformations are manifested in the territory through architecture, the arts, fashion, and music, within their multiple urban dynamics.



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C24.08-Cultural Geography, Society and Heritage => Beyond Representation: Cultural Geographies in the Age of the Anthropocene



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1187 - Mourning And Planting Trees Research On The Reconstruction Of Tsunami Affected Areas In Japan From A Temporal Perspective

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Background

Coastal areas that suffered unprecedented damage during the Great East Japan Earthquake have undergone large-scale infrastructure development under government leadership. Although this type of reconstruction project carries inherent difficulties in terms of considering the local context and circumstances of individual victims, prioritizing the speed of development by limiting the reconstruction to 10 years made it even more difficult to cope with them.

Materials and methods

This study focuses on a reconstruction process that differs from conventional reconstruction. It examines what the flow of time during that period means for people experiencing grief due to bereavement. Specifically, it focuses on the tree-planting activities in Rikuzentakata City, Iwate Prefecture, aimed at preserving disaster memories. Through interviews with those involved, this study considers the meaning of the passage of time in the context of the relationship between plants and humans.

Results

The fieldwork revealed the following: First, the experiences of grief among tree-planting participants range from those that arise while witnessing the progress of the government's reconstruction of tsunami-affected areas to feelings that may occur in the future depending on the characteristics of the place (such as memories and materiality) to those that arise precisely because of the ongoing activities. Second, the spatial and temporal characteristics of tree-planting—such as its continuity, repetition, autonomy, and safety—ease individuals' grief, providing them a way to continue their relationships with the deceased while still mourning them.

Conclusions

Grief recovery is an issue that cannot be dealt with by a time-bound reconstruction project; however, rebuilding a place by planting trees could help facilitate it.



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1192 - “the Wind Realm Of Memories”listening To More Than Human Soundscapes

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Human engagements with environments have long been mediated through the senses, yet sensory perception is neither universal nor fixed; it is historically and culturally shaped. In the Anthropocene, the marginalisation of non-human sounds within everyday soundscapes reflects a broader crisis of environmental perception, contributing to the attenuation of human attentiveness to ecological change. This condition calls for cultural-geographical approaches that move beyond representational frameworks and attend to embodied, affective, and more-than-human forms of knowing.

For many Indigenous peoples, listening to the sounds of wind, waves, birds, and other non-human entities constitutes a culturally embedded practice through which knowledge, memory, spirituality, and ethical relations are transmitted. Such listening practices are not merely sensory but relational and performative, enacting more-than-human worlds through what may be understood as “deep listening.” Within this context, Indigenous soundscape memory functions as a non-representational mode of environmental knowledge that challenges anthropocentric assumptions and reconfigures human–environment relations.

Drawing on soundscape memories from Indigenous communities in Taiwan, this study foregrounds non-human sonic elements as active participants in cultural and ecological life. Employing “weaving” as a conceptual framework, the research interlaces bodily perception, emotion, memory, and spirituality to explore how environmental meaning is continuously produced through listening practices. By re-entangling Indigenous cultural contexts with scientific discourse and lived experience, this study articulates an alternative cultural geography of the Anthropocene—one that foregrounds more-than-human ethics, sensory attentiveness, and place-based environmental consciousness. In doing so, it contributes to debates on non-representational cultural geographies and offers insights into reimagining environmental education and human–land relations beyond anthropocentric paradigms.



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1364 - Reframing Arctic Indigenous Climate Change Imaginaries Cultural Geographic Representations In The Netflix Drama North Of North

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Climate change is increasingly reshaping the lived territories of Arctic Indigenous communities, generating multidimensional transformations across ecological environments, subsistence practices, social relations, and collective identities. From a cultural geographic perspective, these transformations are not only material but also discursively produced through spatial imaginaries that mediate how places, territories, and vulnerabilities are understood. While existing research has extensively documented these changes through scientific and policy-oriented assessments, comparatively less attention has been paid to how such transformations are culturally mediated and rendered meaningful through media narratives.

Situated at cultural geography, media geography, and climate communication, this study examines how climate change is represented in the Netflix drama North of North, focusing on the construction of cultural–geographic imaginaries of place, vulnerability, and resilience in portrayals of Arctic Indigenous life. The study asks: How does entertainment media spatialize, temporalize, and politicize climate change to reconfigure Indigenous place based identities in the Anthropocene?

Methodologically, the study adopts a systematic content analysis informed by Neuendorf's (2017) framework. Drawing on interdisciplinary literature on climate change and Indigenous geographies, key climate impact dimensions were operationalized into an analytical framework and applied to scene level analysis across the drama's episodes. A structured codebook was developed to ensure analytical consistency, enabling the identification of recurrent narrative patterns through four media mechanisms—representation, transformation, reduction, and expansion.

The findings demonstrate that North of North embeds climate change within layered cultural–geographic meanings through three interconnected narrative operations: (1) the spatialization of climate impacts via transformed landscapes, mobility routes, and territorial relations; (2) the temporalization of cultural continuity through intergenerational knowledge and adaptive practices; and (3) the politicization of vulnerability through portrayals of Indigenous agency and resilience.

By foregrounding media as a site of geographical meaning-making, this study demonstrates how global streaming content rearticulates Arctic Indigenous place-based identities, vulnerability, and resilience within Anthropocene debates.



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1370 - Visualization Analysis Of Spatial Structure Using Mental Maps In Jyana Nakijin Village

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Purpose

Traditional places specific to local communities on Okinawa Island, such as sacred sites and culturally significant spaces, in many cases remain physically intact; however, they are less consciously recognized by community members than in the past. This paper aims to examine changes in community members' spatial cognition by analyzing the relationship between their mental images and actual spatial configurations, as well as the connections between traditional landscapes and social relationships.

Data and Methods

To examine differences in spatial cognition across age groups, this study conducted semi-structured interviews with community members and collected hand-drawn mental maps. Participants included four high school students and eight elderly residents of the village. During the interviews, participants were asked to describe their images of the village and their memories associated with it, and to produce mental maps illustrating their spatial cognition and personal experiences of village space.

Results

The analysis revealed two key findings. First, several elements of spatial cognition were shared across generations. Commonly recognized landmarks were concentrated in the central southern part of the village, and both age groups identified the main road and the road behind the community center as key paths. Second, clear generational differences in spatial cognition were observed.

Conclusion

Elderly residents demonstrated strong recognition of traditional cultural spaces, including ritual spaces and sacred sites(see Figure 1), often accompanied by symbolic meanings rooted in lived experience and social relationships. In contrast, high school students showed a more practical form of spatial cognition centered on roads and commercial facilities used in daily life(see Figure 2), with relatively weaker recognition of cultural spaces. These findings indicate that deepening local understanding requires bridging different generational frameworks of spatial cognition and establishing mechanisms for sharing and transmitting the meanings of traditional landscapes and cultural spaces.



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1837 - Heterogeneous Grassland Landscapes Entanglements Of Development Conservation Disasters And Local Resource Use In The Aso Region Japan

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The Aso region in Kumamoto Prefecture, Japan, is characterized by extensive semi-natural grasslands. These grasslands have been shaped through human interventions such as controlled burning, grazing, and grass harvesting by local livestock farmers. They are widely recognized as a cultural landscape formed through long-term interactions between people and nature. However, the continual use and management practices have declined due to demographic change and shifts in local livelihoods, leading to a decline in grassland area.

This presentation examines changes in resource use and grassland management in the Aso region. I draw particular attention to the relationship between environmental frameworks and everyday practices and explore how grasslands have been represented, valued, and managed at different scales.

The analysis is based on extensive documentary research as well as intermittent fieldwork conducted since 2022 with a pasture management association in Aso City, including interviews with association members and observations of grassland management activities such as controlled burning.

Two major environmental frameworks have shaped resource utilization and grassland landscape in the Aso region. Development-oriented projects, implemented from the late 1950s onward, promoted the conversion of wild grasslands into pastures planted with improved exotic grass species in the name of agricultural and livestock productivity. From the 1990s, conservation-oriented initiatives reframed wild grasslands as landscapes to be maintained for their cultural and ecological significance. In addition to these frameworks, natural disturbances including frequent heavy rainfall events and the 2016 Kumamoto Earthquake have also influenced management decisions and patterns of resource use.

Rather than treating the Aso grasslands as a single, uniform landscape, this study highlights the micro-scale variations that emerge through the entanglement of environmental discourses, policies, institutions, local practices, and dynamic natural processes.



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2029 - The Soft Power Of Winter Olympics Games

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Soft power is a important concept coined by Joseph Nye (2005). It refers to a state's ability to strategically influence actors on the international stage through its values, cultural heritage, and the credibility of its institutions.

The case of the Olympic Games and the Opypmic games is the most emblematic in the history of sport. States have often used the games both to re-establish contacts with countries with which relations were tense and as a form of power assertion. Participation in the games is a way of asserting one's existence, as evidenced by the fact that more states participate in the Games than exist as officially recognised sovereign entities with territory (Bettoni, Pioletti, 2020).

The winter Olympic Games Milano - Cortina 2026 may be an opportunity to improve dialogue between some states?

The research, through qualitative and quantitative tools, aims to understand the event's effectiveness on relations between peoples.

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Nye J. S. (2005), *On the Rise and Fall of American Soft Power*, doi.org/10.1111/j.1540-5842.2005.755_1.x

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2283 - Polish Indian Relations In Warsaw's Forms Of Commemoration

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Despite the considerable geographical distance between Poland and India, the fates of these two countries are interconnected to a much greater extent than might be expected. These relations date back as far as the fifteenth century, beginning with the first visits of Poles to the Indian subcontinent, and extend through the events of the Second World War and the fate of Polish refugees following the signing of the Sikorski–Mayski Agreement on 30 July 1941, to the official establishment of diplomatic relations at the ambassadorial level on 30 March 1954. This project presents an analysis of selected elements of Warsaw's urban space, including urbanonyms and other forms of commemoration associated with India. The identification of these elements was based on the TERYT (Poland's official National Register of Territorial Division) and an online search, as well as on the authors' personal experiences as life-long residents of the city. This approach proved essential for the successful research, as it enabled the identification of elements not included in online databases. The identified objects were then visualized on the city map. Each object was described with reference to four research questions: (1) In which district is it located? (2) In which year did it appear in the urban space? (3) Whom or what does it commemorate? (4) If it contains an inscription, in which language is it written? The results of the study indicate that the forms of commemoration in Warsaw are most frequently associated with Maharaja Digvijaysinhji, the ruler of Jamnagar in what is now the state of Gujarat, whose principality provided refuge for Poles during the Second World War. In addition, it was observed that most of the elements are located in the central districts of Warsaw, in sites of a prestigious and representative character. The study serves as an introduction to further reflections on the symbolic dimension of Polish–Indian relations.



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2657 - Cultural Issue For Sustainability When Being In A Place Meets Being From The Place

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In geometry, the word “corner” presents no complexity: two intersecting lines form an angle, and there lies the corner. In geography, the opposite is true: the metaphorical and symbolic meaning of a corner refers to a variety of places, with their materiality, qualities and activities, and to which people have an attachment, a special relationship made up of emotions, activities and representations.

In this paper, part of ongoing research, we pose that this attachment has always been a social and cultural construct, which remains the subject of disruptions. Even more so in this day and age, where metropolization has transformed space and places, where globalization, migration and technological advances have disrupted our special relationship to places; when the transformations of places make people feel, they lose their sense of place; when people find no sense of place. In this context, various situations are even more problematic when we consider the ideas, ideals and practices of sustainability. The question we ask is how much the sense of place its transformation, or lack thereof, can affect how people in different places cope with sustainability.

After having presented a table of different situations and problematizations, we will focus on two cases, recompositions and resistances, whose social, cultural and even political causes and effects varied.



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**C24.08-Cultural Geography, Society and Heritage
=> Entangled Scientific Landscapes: Discourses
and Reality of the Physical and Human (Cultural)
Geographies' Interactions**



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1155 - The Professional Landscape Of French Geography The Return Of Physical Geography

Kimberley Du Buat¹

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Human and physical geography are complementary disciplines, a complementarity that is reflected in the professional landscape of geographers, as evidenced by the positions they occupy. Issues related to global climate change, resource management, and environmental protection have contributed to the re-establishment of physical geographers in a prominent position in France, a position they had previously lost (Orain, 2009; Péguy, 1982). To date, no study has sought to delineate the professional landscape of geographers working in France outside higher education, thereby limiting our ability to assess the scale of this phenomenon.

I began in 2022 a PhD (PhD thesis defended in 2026) about “being a geographer in France” which offers a first socio-geography of geographers in France. Geographers are studied on an individual and collective scale, through an analysis of individual careers and collective strategies. Three main methods are used: individual monitoring of five classes of doctors in geography in France (655 surveyed, five classes of geography PhDs, that have defended their thesis in 2006, 2009, 2012, 2015 and 2018 in France), a questionnaire distributed nationally to all types of geographers (1000 respondents) and some interviews.

If physical geography had lost its prominence, does an analysis of the professional landscape of geographers make it possible to confirm the hypothesis of a strong resurgence of this branch of geography? Do we observe differences in careers paths between physical and human geographers, concerning the type of employer, the area of activity, socio-professional category and professional mobility ? I will test these hypothesis in this presentation, by exploring my two databases through the prism of the division between human and physical geography, in the context of the increasing importance of environmental issues.

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PÉGUY, Charles-Pierre. “Vers Un Renouveau d'une Géographie Physique Régionale ?” *L'Espace Géographique* 11, no. 3 (1982): 182–84. <http://www.jstor.org/stable/44380829>.



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1990 - Virtual Home Tribe Connecting Indigenous People With Traditional Knowledge

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There are only 2% of the total population are indigenous people in Taiwan. But there are 16 officially recognized indigenous ethnic groups, each group has their own language, culture, environmental knowledge and living wisdom. Many of them have moved to cities and their next generation has lost their native language and traditional knowledge. The time is crucial and it is critical to archive indigenous knowledge, especially environmental knowledge, and passing to younger generation. We propose an concept called “virtual home tribe” as the media to archive the indigenous knowledge in the virtual environment. So the young generation can learn from their elders in their home tribe environment, even though they are physically sitting in the classroom in the city. We cooperate with the chieftain, elders, and the youth at the Tomiyac Tribe in Hualien County, Taiwan. The aerial photographs of their traditional territory are taken by an unmanned aerial vehicle. These aerial photographs are used to generate the virtual reality environment which is composed of ortho-rectified photograph and 3D mesh model. We also shoot videos while the chieftain showing us how to identify the terrain and the plants, and how to collect plants as food or for living goods. These videos are embedded into the virtual reality environment. We cooperate with a high school in New Taipei City which has an exclusively indigenous class and teach students with the virtual indigenous home tribe. The result is better than teaching the same indigenous content by traditional slides embedded with photographs and videos.



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3212 - Sacred Territory And Imperfect Peace Reconfigurations Of Kankuamo Space After The Armed Conflict In Colombia.

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Universidad Nacional De Colombia, Geografía, La Paz-Colombia ¹

The Kankuamo people, one of the four Indigenous communities of the Sierra Nevada de Santa Marta, have faced a double challenge: the armed conflict that disrupted their territory and the struggle to preserve their sacred worldview, articulated with the Línea Negra (Black Line) and ecological-spiritual balance. Following the Peace Accords (2016), their process of territorial reconfiguration reveals tensions between expectations of autonomy and the limitations of the State (Díaz et al., 2021). This article analyzes how the geography of the sacred has been key to their resistance and the construction of an imperfect peace, marked by territorial disputes and cultural revitalization (Ruelle-Orihuela et al., 2023). This study focuses on the Kankuamo reservation (Cesar, Colombia), an ancestral territory in the SNSM (National Sanctuary of the Amazon), declared a World Heritage Site and the epicenter of the armed conflict (Rodríguez-Zapata et al., 2024). Qualitative methodology with an ethnographic approach was used: (1) Data Collection: Document review semi-structured interviews were conducted with mamos, leaders, and women (2019-2023) about ritual practices (Arbeláez-Ruiz, 2022). This was complemented by participatory social mapping to identify affected/claimed sacred sites. (2) Data triangulation: A critical discourse analysis of peace. (3) Validation: Feedback of results to Kankuamo authorities through community workshops. It was found that territorial reconfigurations were achieved with the peace agreement, allowing for the recovery of sacred sites as acts of resistance, despite illegal mining and state abandonment. On the other hand, it was found that there is an imperfect peace. Some positive aspects seen include the revitalization of *pagomentos* as tools for social cohesion and protest against dispossession, as well as a vindication of women's role as guardians of oral tradition, weaving backpacks with symbols of conflict and reconciliation. Peace for the Kankuamo people is not limited to the absence of violence, but to the restitution of their sacred geography and the recognition of their agency as political actors. While the 2016 Accords opened symbolic spaces, structural challenges persist. Their experience demonstrates that peacebuilding must engage with Indigenous ontologies, where territory is a living being and the spiritual is the foundation of justice.



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C24.08-Cultural Geography, Society and Heritage => Geographical Perspective on the Protection of Historical and Cultural Heritage



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1391 - Cultural Landscape And Landscape Citizenship Policies And Disputes In Brazilian World Heritage Nominations

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The cultural landscape has assumed a strategic position in international heritage policies and has been increasingly incorporated in Brazil, particularly through nominations to the World Heritage List. This paper presents the results of a research project that comparatively analyzes four Brazilian cases inscribed under this typology: Rio de Janeiro: Carioca Landscapes between the Mountain and the Sea (2012), Pampulha Modern Ensemble (2016), Paraty and Ilha Grande (2019), and the Sítio Roberto Burle Marx (2021).

The aim is to understand how this category of cultural landscape has been operationalized as a technical, political, and symbolic instrument for the management of heritage and territory.

The methodology combines documentary analysis of nomination dossiers and management plans with interviews with technicians, managers, and communities, drawing on a critical geographical perspective that understands landscape as a cultural and political construction.

The results reveal strong heterogeneity among the sites inscribed as cultural landscapes in terms of scale and socio-spatial complexity, ranging from the Sítio Roberto Burle Marx, with a relatively limited territorial dimension (40.5 ha), to Paraty and Ilha Grande, with more than 148,831 ha, encompassing multiple municipalities, protected areas, and traditional communities under intense tourism and real estate pressure. Between these extremes are the Carioca Landscapes, marked by the metropolitan complexity of Rio de Janeiro, and the Pampulha Modern Ensemble, a singular expression of modernist landscape design in a consolidated urban area of the city of Belo Horizonte.

Despite this diversity, the analysis points to recurring difficulties in the organization and effectiveness of management committees, weakening the political spaces envisaged as arenas of participation: a central promise of the UNESCO nomination projects. What is referred to here as landscape citizenship, understood as the collective right to the production and representation of landscape, faces concrete limits in implementation, revealing a persistent gap between the formal recognition of cultural landscapes and their translation into effective practices of democratic governance.



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1519 - Protective Development Pathways For Chinese Settlement Heritage Under The Dual Context Of Globalization And Localization

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At present, research on Chinese settlement heritage has gradually expanded from material preservation to both maintenance and transmission of intangible cultural heritage. Nonetheless, issues such as constructive and developmental destruction - stemming from cognitive limitations, short-sighted decision-making and inadequate enforcement of regulations - remain prominent, posing developmental threats to the authenticity and integrity of heritage. In light of this, there is an urgent need to focus on three core issues. Firstly, enhancing the practical transformative efficacy of empirical research to provide precise theoretical guidance for heritage protection and development practices. Secondly, constructing the dynamic balance mechanism between protection and development, in order to mitigate the weakening of agency in intangible cultural heritage amid contemporary transformations. Thirdly, establishing sustainable synergistic paradigms for tourism utilization and authenticity preservation to achieve institutional innovations in the adaptive reuse of cultural heritage.

This study employs the qualitative research method to systematically summarize experiences in protection and renewal practices. Firstly, systematically reviewing relevant domestic laws, policies and practical cases. Secondly, gathering primary data and empirical evidence through field investigations. Thirdly, distilling referential experiences and pathways through comparative analysis of typical protection models. It primarily unfolds systematic discussions around the following three dimensions - reviewing the current status and major achievements of cultural heritage protection in China, with emphasis on the foundational role of relevant regulations in institutional construction. Analyzing problems in current settlement protection efforts from perspectives such as cognitive biases and short-term behaviors by local governments, along with their underlying causes. Synthesizing practical experiences in protection and utilization through typical cases of ancient villages and towns in China, with the aim about providing operable referential paradigms for similar practices. Conducting comparative research on heritage protection mechanisms in Euro-American countries, analyzing features such as the dual-track management and diversified funding mechanism, to offer valuable insights for improving management mechanisms and support systems in China.



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1658 - Music Festivals As Spatial Instruments Of Intangible Cultural Heritage In India Typology Temporality And Urban Cultural Landscapes Of Varanasi

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Background / Hypothesis

In historic cities, intangible cultural heritage is sustained through place-based cultural practices, temporal rhythms, and collective participation. In Varanasi, classical and semi-classical music traditions, recognised internationally as part of the city's intangible cultural heritage (as Creative City of Music Network in 2015 by UNESCO) form a core component of its cultural identity. This paper hypothesises that music festivals function as spatial instruments of heritage protection, where typology and temporality together shape the visibility, meaning, and continuity of musical traditions. Using Varanasi as a representative historic urban context in India, the study examines how music festivals articulate cultural values related to devotion, institutional legacy, historical memory, and governance.

Materials and Methods

The study is based on direct field observations conducted across multiple seasons during live music festivals/ events constituting classical & semi-classical music performances in Varanasi between 2023–2024 and early 2025. These observations are supplemented by informal interactions with music listeners, performers, and event organisers. Secondary data sources include photographic documentation of venues and activities, published literature, archival materials, digital pamphlets, social media content of festivals and institutions, and official records from governmental and organisational websites.

Results

The analysis identifies four major categories of music festivals: events with religious associations; seasonally embedded festivals; commemorative and institution-based events; and initiatives led by government, non-governmental, and private agencies. Each category exhibits distinct spatial settings and cultural meanings linked to devotion, identity, historical memory, institutional legacy, and governance. The temporal distribution of festivals reveals clear peak and off-season patterns shaped by religious calendars, climatic conditions, and socio-cultural cycles.

Conclusions

The study demonstrates that music festivals actively organise intangible musical heritage through spatial concentration and temporal regulation. By embedding musical practices within specific places, religions and seasons, festivals contribute to heritage continuity while reshaping urban cultural landscapes. This spatial-temporal perspective offers valuable insights for heritage protection strategies in historic Indian cities.



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1701 - Living With The Desert State Environmentalism Local Experience And The Generation Of Ecological Resilience From The Periphery

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Ecological governance in state-centric developmental contexts is often dominated by state environmentalism, a paradigm characterized by high-modernist engineering and target-based mobilization. While effective in resource allocation, such macro-narratives frequently obscure the lived experience of communities inhabiting the frontlines of ecological fragility. Challenging the binary of state planning versus local passivity, this paper draws on Southern urbanism to argue that true resilience in the periphery is generated through the dynamic friction between rigid state strategies and fluid vernacular practices. We examine Minqin, an oasis designated as a national ecological security barrier in Northwest China, positioning it not merely as a policy recipient but as a site of theoretical production where local agency reshapes environmental governance. Based on intensive fieldwork and 26 in-depth interviews, the study identifies three dimensions where local experience reconfigures state logic. First, we observe an epistemic shift from containment to coexistence; while the state traditionally frames the desert as an enemy to be conquered, locals have evolved a philosophy of living with the desert, reframing negative assets like sand into productive resources for sand industries and cultural memory. Second, the study traces a transformation in mobilization from state coercion to an endogenous social contract, where local ecological brokers translate abstract political mandates into a vernacular ethics of homeland defense. Finally, unlike the engineered stability promised by the state, local resilience is shown to be generated through everyday adaptive agency, filling the structural gaps left by formal governance. Ultimately, this paper contributes to Southern theory by conceptualizing resilience not as a technical outcome but as a socially generated process, demonstrating that the local experience of the periphery is a generative force offering distinct alternatives to the one-size-fits-all model of ecological modernization.



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1710 - Church Distribution And Architectural Heritage In The Yangtze River Basin During The Modern Period A Historical–geographical Perspective

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The Yangtze River Basin represents a highly structured geographical system shaped by river hierarchies, transportation networks, and long-term regional differentiation. From a historical and cultural geographical perspective, this paper examines the spatial distribution, configuration, and architectural legacy of Christian churches during the modern period within the Yangtze River Basin, with particular emphasis on their role as built cultural heritage.

Drawing on missionary records, county gazetteers, historical maps, and georeferenced church data, the study analyzes the spatial patterns of both Catholic and Protestant churches across the basin. Rather than centering on missionary expansion as a historical narrative, the paper focuses on how churches were spatially embedded within the basin's geographical structure, forming distinctive distribution patterns along the main river, tributary systems, and regional sub-basins. Differences in institutional organization between Catholic dioceses and Protestant mission networks are considered as explanatory factors shaping contrasting spatial configurations.

The analysis reveals clear spatial differentiation across the upper, middle, and lower reaches of the Yangtze. Church distribution in the lower reaches tends to be dense and continuous, closely associated with urban networks and highly accessible waterways. In the middle reaches, churches display multi-centered patterns linked to tributaries and lake systems, while in the upper reaches distribution is more fragmented, characterized by node-based and corridor-oriented arrangements constrained by topography and accessibility.

These historical distribution patterns continue to influence the present-day landscape of surviving churches and their heritage protection status, demonstrating strong spatial continuity between historical configurations and contemporary architectural heritage recognition. By linking church distribution with basin-scale geographical structures, this study highlights the role of river systems in shaping religious architectural landscapes and contributes to broader discussions on historical geography, cultural heritage geography, and regional differentiation.



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2077 - Geographical Image As Cultural Symbol The Composition Of The Yellow River Cantata And Its Spreading

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Since the late nineteenth century, China was integrated into the world trading system. while it was become a semi-colonial and semi-feudal society. The nationalist rose in China. There were many Intellectuals to construct a term, “Chinese Nation” (Zhonghua minzu), to unified all ethnic groups in China to counter foreign powers. In the historical process, the Yellow River composed by Guang Weiran and Xian Xinhai in 1939—base on its hydrological characteristics and geographical location in territory of China—was made as geographical image and a cultural symbolic of the Chinese Nation. Taking the Yellow River Cantata as a case study, the research recovered the performances of the Yellow River Cantata by using historical archrivals and reports in journals and newspapers, etc. then drawing the spreading and diffusion of Performance, contemporary periodicals by GIS analysis. The authors found that the composition formed the distribution all over the country centered in Yan’an and Chongqing since it created in Yan’an. The case study try to interrogate how music harnesses geographical imagery to construct national cultural symbols, and in the other side, how the political imperative could accelerate musical transmission. The paper elucidates the mutually constitutive dynamics among soundscape representation, nationalist ideology, and musicopolitical practice.



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2567 - Methodological Frameworks For The Landscape Of Val Fontana (italy) The Cultural And Natural Heritage From A Geographical And Historical Perspective

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The interpretation of historical heritage and cultural landscape requires understanding their formation process and diachronic evolution, as they were shaped by the millennial relationship between man and environment. From a geographical point of view, this can be comprehended as the result of the process of territorialization theorized by the Italian geographer Angelo Turco, whereby nature is progressively named, reified, and structured.

Starting with this premises, the study analyses the historical heritage and cultural landscape of the Val Fontana, a valley located in the Retic Alps of the Middle Valtellina (Lombardy Region, Italy), between the municipalities of Chiuro and Ponte in Valtellina.

From a methodological perspective, the valley is analysed in an interdisciplinary way, bringing into dialogue specific scientific approaches of the historical and geographical disciplines. Indeed, the study integrates historical written and cartographic sources conserved in national and local archives with an articulated field investigation for producing maps and photographic materials. Data are collected and elaborated using GIS tools for the implementation of a cartographic database: the main goal is to reconstruct the territorial development that have contributed to the definition of the current landscape and the conserved heritage of the valley. In conclusion, to restore a critical reading of the relationship between heritage and landscape transformations, geographical and historical knowledge can be considered as a cultural resource for their capacity of interpreting that co-evolution; in this way they can contribute to define scientific-based conservation and protection criteria, in dialogue with the national and international legislation.



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3201 - Challenges In The Revitalization Of A Listed Public Garden In Rio De Janeiro Neglect And Defense Of A Cultural Heritage

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Disputes over the use and ownership of urban space are never trivial. Civic culture and politics constitute the substratum of heritage policies and determine their success or failure. Strict regulatory frameworks do not necessarily guarantee the preservation of listed heritage sites when multiple interests compete for urban land. This is the hypothesis guiding the analysis of the conflictual relationship between the protection of a listed public garden—Jardim de Alah, representative of the cultural memory of a particular period—and the distrust expressed by political and social sectors regarding the value of that memory. This study results from research on the impasses surrounding the revitalization of a listed heritage site in Rio de Janeiro, but it is also paradigmatic of the dilemmas posed by disputes among different social actors and interests concerning the value of public cultural heritage.

The conceptual point of departure is adapted from Stone (1989), for whom governing a city requires more than formal authority. It also requires resources: money, technical expertise, control over land, and political influence. Taking these elements as a methodological analytical framework, the study mapped the discourses, actions, and actors involved in the dispute over the revitalization of the public garden built in 1936 in Rio de Janeiro.

The findings show that, despite the historical and aesthetic value of this 93,600 m² public space located between two affluent neighborhoods, local residents remain divided over the project proposed by the private company awarded the municipal concession. Public opinion is similarly split between revitalizing a long-neglected public space or transforming it into a commercial area.

The conclusions highlight two key issues: first, a low level of civic culture in debates and actions concerning heritage preservation, even among high-income and highly educated residents; second, unlike most heritage-related conflicts, this case is not driven by real estate capital but by commercial interests.



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C24.08-Cultural Geography, Society and Heritage => Geographical Perspective on the Protection of Historical and Cultural Heritages



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1214 - Donald Trump In Cantonese Opera A Geo Cultural Review Of Cantonese Opera As An Ich In Hong Kong

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Cantonese opera, as one of China's long-established art forms, was inscribed on the Representative List of the Intangible Cultural Heritage of Humanity in 2009 by UNESCO. Yet, Cantonese opera has faced significant challenges, making its preservation and revitalization an urgent and crucial task.

Hong Kong occupies a unique position in the development of Cantonese opera. Its historical status as a British colony—distinct from mainland China—helped Cantonese opera survive the Cultural Revolution. In recent years, efforts to conserve the art have included the establishment of museums and dedicated opera venues, alongside privately-owned Cantonese opera troupes that create distinctive, modern-style productions. Notably, innovative new plays like “Trump, The Twins President□□□□□□” have drawn public attention and attracted new audiences.

This paper aims to explore the effective methods for conserving Cantonese opera as a sustainable ICH. Three questions are examined: 1. An evaluation of different conservation approaches (Tangible and intangible heritage protection tactics) for Cantonese opera, 2. The importance of innovation in safeguarding Cantonese opera as a sustainable ICH, and 3. The relationship between Hong Kong's distinctive geopolitical context and the development of Cantonese opera.

The study interviewed multiple local government departments, institutions, troupe members, and creators involved in the Cantonese opera sector. Through fieldwork and case studies, it examines how Hong Kong's laissez-faire system and commercial dynamics have provided impetus for innovative repertoires that both cultivate new audiences and support the traditional plays, offering a model that other intangible cultural heritages might emulate. Nevertheless, as Hong Kong and mainland China are increasingly integrated and unified, the related social and economic changes may affect the freedom of artistic expression and the future trajectory of the sector.



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1239 - “without The School The Village Has No Soul” Rethinking School And Socio Cultural Resilience In Rural China

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The improvement of rural settlements has increasingly received attention from the government, yet essential social infrastructure within rural, such as schools, often faces the threat of closure, hindering the establishment of a well-functioning rural habitat system. This study rethinks the role of rural schools not merely as educational institutions, but as relational infrastructures that hold potential to sustain socio-cultural resilience in transforming rural China. Drawing on an in-depth ethnographic case study of a historically significant Hakka village in Guangdong Province, the paper introduces the concepts of school-based ties (xueyuan) and village-based ties (xiangyuan) to examine how identity and community are co-produced through both functional practices and symbolic forms. Findings reveal that rural schools play a dual role: providing everyday care, educational access, and community interaction in terms of functions, while also serving as symbolic anchors through spatial memory, ritual continuity, and intergenerational narratives. The analysis contributes to the interdisciplinary dialogues in rural resilience, infrastructural geographies, and cultural identity by conceptualizing rural schools as dual-track infrastructures of belonging and meaning-making. It further challenges the efficiency-driven logic of school consolidation policies by foregrounding the emotional, symbolic, and relational functions of rural education. As rural settlements confront demographic decline and institutional withdrawal, sustaining such schools may prove critical to preserving the cultural fabric and future viability of rural life.



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1244 - Exploring The Delineation Methods For Buffer Zones Of Historical And Cultural Villages From A Perspective Of Cultural Geography A Case Study Of Huitong Village In Zhuhai China

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The buffer zone of a historical or cultural heritage always surrounds the core protected area of the heritage. Currently, there are no mature or universally applicable methods for buffer zone delineation. This study examines the historical and cultural village, Huitong Village in Zhuhai, Guangdong, as the research area. From the perspective of cultural geography, this study explores a new framework for delineating buffer zones with three steps. This paper proceeds from two points: the integrity of the water system and the shared value of mankind in the visual corridors. The conclusions of this study are as follows: (1) The most creative research conclusion of this paper is that researchers or planners should not confine the cultural significance of visual corridors within fixed frameworks, but instead encourage viewers of visual corridors to engage in reflective thinking about the spatial relationships from view point to the object, thereby enhancing the acceptance of the meaning of visual corridors among different groups of people. (2) this study shows the feasibility of our proposed buffer zone delineation method based on cultural geography; (3) the delineation method of buffer zone in this study can serve as a reference method of value comparison for historical space protecting planning at different scales.



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1298 - Comparison Of Road Itinerary Books In Early Modern East Asia

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With the development of road transportation, travel guides were developed to facilitate road trips. Typical examples were the milestones and itineraries already present on ancient Roman roads.

I believe that road networks accurately reflect the local governance systems and social structures of a given region and era. In this study, I would like to prove this hypothesis using geographical reference books from early modern East Asia, specifically Japan, China, and Korea.

Itineraries were widely circulated in China during the Ming and Qing dynasties. They were edited and published by merchants, including Huizhou merchants, and included information on regional specialties and business tips along with the itineraries. As a centralized empire, it was characterized by a radial and linear road system centered on the capital, Nanjing and Beijing.

In Korea during the Joseon Dynasty, which also had a centralized system, itineraries described a radial road system centered on Seoul as well.

However, unlike China, they were compiled mainly by the government and scholars rather than merchants, so the will of those in authority was strongly reflected, and they were not circulated as widely as in China.

Early modern Japan, unlike China and Korea, was a decentralized state based on a feudal system. As a result, there was no unified road network across the country, and only a few trunk roads were directly operated by the state. The rest were roads managed by local branch offices and roads managed by local landlords, and these three layers coexisted. For this reason, no itineraries covered the entire country, and they were published sporadically.

In this way, even when viewed from itineraries, land transportation routes can be said to be a mirror that reflects a certain place at a certain time.



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1486 - The Approach To Developing Heritage Tourism At Liangzhu Archaeological Site Park Of China Based On The Perspective Of Spatial Production Theory

Yinglan Zhang¹, Rongwei Li¹

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In recent years, significant achievements have been made in establishing national archaeological site parks in China, an approach to conserving and utilizing major archaeological sites. While the transformation of many sites from mere “archaeological remains” into “site parks” is progressing, challenges persist in areas such as integrated conservation and development, heritage interpretation, tourism strategies, and visitor experience. Consequently, feasible models for sustainable heritage tourism development require further refinement.

Focusing on Liangzhu National Archaeological Site Park, this study employs literature review, field surveys, and in-depth interviews to assess its tourism resources and current status of heritage tourism development and value communication, based on the national standard for Classification, Investigation, and Evaluation of Tourism Resources. By applying Henri Lefebvre’s “spatial triad” framework and incorporating the “physical–cultural–social” logic of field theory, the study deconstructs the production of heritage tourism space at the archaeological site parks, analyzing its material, spiritual, and social spatial features. The process and model for integrating “material space”, “cultural space”, and “social space” are thoroughly investigated.

Through an in-depth case study of Liangzhu National Archaeological Site Park, this study summarizes generalizable insights and proposes a tripartite model for “space production” of heritage tourism space in archaeological site parks. This model emphasizes: promoting the reproduction of cultural landscape in spatial practice; highlighting cultural value in representations of space; and re-establishing experiential social space in representational spaces. It thus offers a referential approach to integrating heritage space, recreational space, and perceived space. Furthermore, the study systematically analyzes the various actors—including authorities, experts, enterprises, local communities, and tourists—as well as influencing factors such as power, capital, and interests involved in this spatial production

This research represents a constructive exploration of applying “production of space” theory to cultural heritage studies, offering new perspectives for archaeological site parks research. The spatial production model derived from this case study provides theoretical and practical insights for promoting the high-quality, integrated development of national archaeological site parks, supporting sustainable heritage conservation of cultural heritage, and fostering coordinated socio-economic growth in the new era.



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1555 - Internet Famous Landscapes And The Reconfiguration Of Cultural Heritage

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Recent debates in cultural heritage studies increasingly conceptualize heritage as a dynamic and socially constructed process rather than a collection of fixed historical sites. This perspective underscores the role of social practices, interpretation, and negotiation in shaping heritage meanings over time. Nevertheless, in both academic research and governance practices, heritage is still frequently approached as a landscape characterized by relatively stable, predefined, and institutionally authorized meanings. Such approaches tend to prioritize continuity and preservation, while paying less attention to the ongoing production of meaning in everyday contexts.

This paper proposes meaning-layering as an analytical lens to examine how cultural heritage is reconfigured in the digital age. Meaning layering refers to the ongoing process through which multiple interpretive layers coexist and interact within the same landscape, generated by different actors, media, and spatial practices over time. In heritage contexts, these layers typically encompass historical-symbolic meanings, institutionalized heritage narratives, and contemporary everyday meanings produced through digital engagement.

Rather than framing internet-famous landscapes or event as a threat to heritage value or as a separate category of cultural sites, this study argues that their significance lies in the accumulation and reconfiguration of meaning layers. From a geographical perspective, meaning layering highlights the spatial and temporal entanglement of heritage, media, and everyday practice, offering a process-oriented understanding of how cultural landscapes continue to acquire new meanings.



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1616 - Challenges In The Revitalization Of A Listed Public Garden In Rio De Janeiro Neglect And Defense Of A Cultural Heritage

Ina Elias De Castro¹, Alexandre Pinto¹, Guilherme D'amico¹
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Disputes over the use and ownership of urban space are never trivial. Civic culture and politics constitute the substratum of heritage policies and determine their success or failure. Strict regulatory frameworks do not necessarily guarantee the preservation of listed heritage sites when multiple interests compete for urban land. This is the hypothesis guiding the analysis of the conflictual relationship between the protection of a listed public garden—representative of the cultural memory of a particular period—and the distrust expressed by political and social sectors regarding the value of that memory. This study results from research on the impasses surrounding the revitalization of a listed heritage site in Rio de Janeiro, but it is also paradigmatic of the dilemmas posed by disputes among different social actors and interests concerning the value of public cultural heritage.

The conceptual point of departure is adapted from Stone (1989), for whom governing a city requires more than formal authority. It also requires resources: money, technical expertise, control over land, and political influence. Taking these elements as a methodological analytical framework, the study mapped the discourses, actions, and actors involved in the dispute over the revitalization of the public garden built in 1936 in Rio de Janeiro.

The findings show that, despite the historical and aesthetic value of this 93,600 m² public space located between two affluent neighborhoods, local residents remain divided over the project proposed by the private company awarded the municipal concession. Public opinion is similarly split between revitalizing a long-neglected public space or transforming it into a commercial area.

The conclusions highlight two key issues: first, a low level of civic culture in debates and actions concerning heritage preservation, even among high-income and highly educated residents; second, unlike most heritage-related conflicts, this case is not driven by real estate capital but by commercial interests.



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1663 - Engaging The Market Through Sacredness Trans Locality Negotiation And The Practice Of Regong Thangka

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This study examines the transformation of Regong Thangka—a representative Intangible Cultural Heritage (ICH) of China—from a static, place-based tradition into a dynamic, trans-local practice. Challenging the traditional view of ICH as a fixed cultural reservoir, this research adopts a theoretical framework integrating trans-locality and assemblage theory to analyze how Thangka breaks through geographical boundaries and reconstructs its “locality” within a globalized market. Based on extensive fieldwork and in-depth interviews in the Regong region of Qinghai Province, the paper reveals the mechanisms of this transformation across three dimensions: the transmission of knowledge, the reconstruction of value systems, and the reshaping of production networks. The findings indicate that Thangka practice is undergoing a profound process of “deterritorialization” and “reterritorialization.” First, the transmission mechanism has shifted from closed, lineage-based temple education to open, standardized vocational and corporate training, facilitating the cross-regional flow of technical knowledge. Second, the value system has been translated from religious merit accumulating within a sacred community to symbolic capital and exchange value recognized by the secular market. Third, a rhizomatic network has emerged, assembling heterogeneous actors—including painters, e-commerce algorithms, logistics systems, and consumers—into a complex production chain. Crucially, the study highlights the agency of practitioners who employ a dual narrative strategy to negotiate the ontological tension between “sacred rituals” and “market logic.” By distinguishing between “painting for faith” and “producing for the market,” practitioners reconcile the conflict between efficiency and authenticity. The study concludes that the “locality” of contemporary ICH is not a pre-given essence but a continuously generated outcome of trans-local negotiations, offering a new perspective on the spatiality and sociality of cultural production.



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1679 - The “foodification” Turn Of Locality A Case Study Of Wudong Village In Southern China **Hong Zhu ¹**

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In the transition to a post-industrial society, food has evolved from a biological necessity into a profound spatial medium that reshapes rural landscapes, economic structures, and social relations. This paper conceptually defines this process as “foodification”—a systematic transformation of geographical space into a retail landscape dominated by dietary consumption—and examines its manifestation in the Chinese context through a case study of Wudong Village in Jiangmen City, Guangdong Province. The study identifies a unique “State-Market-Community” coupling mechanism driving this transition, distinct from Western gentrification, where state-led infrastructure upgrades like the Jiangmen Avenue, market-driven endowments such as proximity to slaughterhouses, and community-based institutional support catalyze the transformation of an ordinary village into a regional gastronomic destination. The research further reveals how foodification reconstructs rurality through the creation of a “consumption theater” characterized by “transparent kitchens” that perform a staged authenticity, and through mediatized re-territorialization where digital platforms encode locality into hyper-real symbols, such as the “Curry Beef Pineapple Bun,” to attract tourist flows and reshape place identity. Concluding that foodification offers a viable path for rural revitalization while simultaneously risking landscape alienation and the erosion of authentic rural fabric by a filter-oriented aesthetic, this paper highlights the complex tension between economic development and the preservation of genuine locality in the digital era.



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1787 - Geographical Perspective On The Protection Of Local Historical And Cultural Heritage

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This article aims to explore the profound transformation of knowledge paradigms from ‘regional studies’ to ‘local studies’ on a global scale. Traditional regional studies focus on macro narratives such as language, history, and politics, with countries or large cultural regions as the basic units. They often have an external perspective and the color of representing others. In contrast, emerging ‘local studies’ (Localogy) emphasize more specific and organic ‘places’ as the research core, focusing on ecology, culture, social memory, and daily life practices within specific geographic spaces, advocating interdisciplinary and multi-party participation (especially local communities) research methods, and committed to the excavation, protection, and revitalization of local knowledge. This article selects local studies practice cases from multiple countries and regions such as Europe, America, and East Asia from an international comparative perspective (such as Japan’s ‘local studies’, South Korea’s ‘regional studies’, as well as the transformation of ‘regional studies’ and ‘urban studies’ in Europe and America), and analyzes their theoretical origins, methodological characteristics, and development paths. The article argues that this paradigm shift is not only an inevitable result of the refinement of academic research, but also a response to the homogenization wave of globalization, reflecting the growing concern of the academic community for cultural diversity, local subjectivity, and sustainable development. Finally, this article will provide an outlook on the future development direction, challenges faced by local studies (such as theoretical system construction, connection with macro research, etc.), and their implications for the thriving construction of local studies in China.



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1903 - The Social Construction Process And Influence Of Chinese Tea Cultural Heritage A Case Study Of Guangdong Dancong Tea

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Tea culture is a core carrier of China's intangible cultural heritage, and the formation of its heritage value is essentially a process of social construction. Taking Guangdong Dancong tea as a case study, based on social construction theory, this paper explores the construction path and practical impacts of regional tea cultural heritage through a combination of field investigation, literature review and in-depth interviews. The study shows that the heritage process of Dancong tea presents dual logics of tradition and modernity. In the historical dimension, tea-making techniques have achieved intergenerational inheritance relying on clan communities, forming a regional system of in-depth symbiosis of "technique-life-culture". In the contemporary context, the tripartite interaction between the recognition of intangible cultural heritage policies, the empowerment of cultural tourism industry and the active participation of tea farmer communities has promoted its identity leap from a regional agricultural product to a national cultural heritage. The multi-dimensional impacts of this construction process are remarkable: it not only strengthens the cultural identity of Lingnan region and promotes the dynamic inheritance of tea-making techniques, but also empowers rural revitalization and local economic development through the "tea culture +" industrial integration model, and further promotes the exchange and mutual learning between regional culture and mainstream culture through tea as a medium. The conclusion of this paper points out that the social construction of tea cultural heritage is the result of collaborative interaction among multiple subjects, and its experience can provide a reference path with both theoretical value and practical significance for the protection, activation and sustainable development of similar intangible cultural heritage in China.



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1984 - Cities In The Asian Region Connections And Comparisons

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In recent years, Chinese academia has viewed the opening of ports and commerce as the key to understanding the development of modern cities and the modernization of China as a state, claiming that the rise of port cities not only promoted local economy, but also spurred the development of the hinterland. Furthermore, they believe that modernization and urbanization work in tandem, which finds its best expression in China.

The overall objective of this study is: to use the chronological materials, the Hong Lists as the core data and modern maps, then use GIS technology to extract spatio-temporal information, and thereby recapture the changes of cityscape and compare cities with similar urbanization processes. The core literature for this project, the Hong Lists, were business directories of cities after they were opened as international ports. The earliest known version was The Chronicle and Directory for China, Japan and the Philippines, for 1866 published by the Hong Kong Daily Press. As the name of the directory suggests, the Hong Lists records the commercial centers in Asian countries at that time, and forms a data basis for comparative research on Asian cities in the 19th century.

This project uses the entries of foreign companies in the Hong Lists as a medium and extracts their spatio-temporal information with the assistance of GIS technology in order to analyze the formation of the cityscape and urban pattern of each city after port opening and thus retrace their urbanization processes. And further study the urban texture and structural characteristics of colonial cities, and the characteristics and the inherent law of urbanization in different historical colonial semi-colonial cities.



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2010 - Crafting Local Characteristics The Practice Of Mutual Shaping Between Materiality And Locality From The Perspective Of Cultural Geography — A Case Study Of Moutai Liquor In Guizhou

Ruichun Hu ¹

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In the context of globalization, which continually dissolves local distinctiveness, the formation mechanisms of local specialties—crucial carriers of cultural identity and regional character—remain a significant blind spot in cultural geography research. Grounded in Goffman’s dramaturgy, this study constructs an extended “Foundation–Backstage–Midstage–Frontstage” framework, using Guizhou Moutai liquor as a case study to analyze the dynamic co-construction between materiality and locality in shaping local identity. The findings demonstrate that: the “Foundation” identifies natural and cultural environments, establishing the specialty’s local belonging; the “Backstage” embeds locality into the material entity through traditional techniques and embodied knowledge; the “Midstage” maintains stable reproduction of quality and locality via standardization and localized control; and the “Frontstage” transforms the material into perceptible local meanings through cultural narratives and symbolic dissemination. By transcending the unidirectional “locality-determines-materiality” logic, this research elucidates the full-process mechanism of mutual shaping between objects and places. It offers a theoretical reference for object–place relationship studies in non-Western contexts and provides actionable insights for the preservation, inheritance, and innovative practice of geographical indication products. This research therefore contributes a dynamic, process-oriented model that illuminates how material artifacts and their places of origin are recursively produced. It moves beyond static, environmentally deterministic views to highlight the ongoing performances and negotiations that sustain a specialty’s authenticity. The case of Moutai demonstrates how a global commodity’s prestige is fundamentally rooted in this staged, multi-layered production of locality. The framework offers a versatile tool for analyzing other heritage crafts and agro-food products, particularly in rapidly modernizing contexts. Ultimately, the study advocates for management strategies that holistically support all four stages—from ecological conservation and artisan transmission to adaptive governance and narrative integrity—to ensure the sustainable vitality of place-based products in a globalized world.



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2039 - In Between Being Quiet And Lively Affective Atmosphere Embodied Experience And Negotiation On ‘the Island Of Music’ On Kulangsu China

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Extensive literature has discussed the relationships between music, place, and tourism, with much work focused on how and why music literally moves people. Kulangsu island, a former colonial settlement in the city of Xiamen in southern China and a UNESCO World Cultural Heritage Site, is promoted as “the Island of Music”. To attract more tourists, the local government is devoted to making the island full of music. However, for different social groups with different connections to the heritage site, there is a disjuncture between the planning goals of the “Music Island” cultural policy and people’s lived experience—most visibly in tensions between the pursuit of a quiet community and a lively resort, and between a familiar neighbourhood and gentrified aesthetics. This paper encourages wider discussion of the role that music plays in atmospheric production for both local communities and tourism activities. Methodologically, it draws on ethnographic fieldwork and soundwalking, combining participant observation with in-situ, route-based listening to document everyday sonic practices, encounters, and situational responses across the island. Building on broader debates about how changing tourism atmospheres in cities shape urban liveability, the paper explores how music and related practices contribute to the communal atmosphere of a heritage site in a relational way. The ways music is performed and inserted into everyday life shape the atmosphere of the heritage site and help mediate atmospheric conflicts.



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2322 - Armero A Mosaic Of Territorial Imaginaries

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Igac, Dip, Bogotá-Colombia¹

Reconstructing Memory in Armero: Forty Years after the Nevado del Ruiz Eruption

The eruption of the Nevado del Ruiz volcano on November 13, 1985, and the subsequent lahars that buried the town of Armero represent one of the most devastating socio-natural disasters in Colombian history, resulting in the loss of more than 25,000 lives. Forty years later, the memory of the territory, the victims, and the structural causes of the disaster faces processes of fragmentation, oblivion, and resignification. From the perspectives of collective memory, risk geography, and territorial justice, this research hypothesizes that the participatory reconstruction of Armero's spatial and social memory contributes to strengthening risk awareness, symbolic reparation, and the prevention of future avoidable disasters.

Materials and Methods

This study employed a qualitative methodology grounded in participatory action research. Memory reconstruction techniques included social cartography, analysis of historical archives, aerial and satellite imagery, oral histories from survivors and victims' families, territorial walks, and the use of geographic tools to identify physical and symbolic traces of the disaster. The research was articulated with educational, cultural, and community-based processes developed within the framework of the 40th anniversary of the Armero tragedy.

Results

The findings reveal the persistence of multiple, territorially embedded memories that intertwine grief, resistance, and collective learning. The spatial configuration of Armero prior to the disaster, the dynamics of lahar flows, and the institutional gaps in risk management existing in 1985 were reconstructed. Furthermore, the process strengthened social appropriation of the territory, intergenerational transmission of memory, and the recognition of Armero as a national reference for disaster risk management and historical memory.

Conclusions

The reconstruction of Armero's memory goes beyond commemoration, consolidating itself as a pedagogical, political, and territorial tool. This approach demonstrates that memory is fundamental to disaster risk management, the dignification of victims, and the construction of safer, more aware, and resilient territories in Colombia.



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2698 - From Lead Firm To Ecosystem Builder How Embedded Enterprises Coordinate Heritage Craft Industries Through Institutionalized Mechanisms

Yijia Zhang¹, Hong Zhu²

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Heritage craft destinations face a fundamental tension—a critical challenge in sustainable tourism development—of preserving artisan autonomy while achieving market standardization. Existing research either focuses on government-led industrial clusters or individual craft enterprises, often failing to address how to balance cultural preservation and economic viability, and overlooking the coordinating role of embedded local firms. Drawing on an in-depth case study of Li Xiaobai, a leading silver craft enterprise in Xinhua Village, China, with 187 collaborative artisans and a decade of industry influence, this study reveals how embedded enterprises can evolve from lead firms to ecosystem builders through institutionalized mechanisms.

We find that Li Xiaobai constructs an industry-wide ecosystem through three key mechanisms: (1) institutionalized craft standards—including a five-step quality inspection process—that enable consistent quality control independent of individual charismatic leaders, (2) scale-driven supply chain sharing that aggregates orders from decentralized workshops to lower procurement costs, significantly reducing entrepreneurial barriers for new entrants, and (3) interest-aligned ecological identity fostered by shared origin brand value and complementary market positioning, sustaining long-term collaboration among over 380 independent workshops. These mechanisms demonstrate that embeddedness and scalability are not mutually exclusive—rather, cultural legitimacy rooted in local traditions enables institutional coordination at scale.

Our findings challenge the dominant assumption that ecosystem building in heritage crafts requires charismatic leadership, showing instead that replicable institutional designs can effectively coordinate decentralized, small-scale craft production. This study contributes to heritage tourism literature by identifying embedded ecosystem building as a sustainable path for intangible cultural heritage revitalization, and offers practical guidance for destination managers seeking to foster indigenous entrepreneurship while maintaining cultural authenticity.



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2781 - How Do Geographical Traps Inspire The Modern Transformation Of Traditional Culture A Case Study Of Shibadong Village

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In the process of rural revitalization in China, geographical traps are often regarded as constraints on the protection and development of cultural heritage. Traditional villages, due to inconvenient transportation and scarce resources, often face crises of cultural inheritance discontinuity and the erosion of cultural value. However, the practice of Shibadong Village in Hunan Province demonstrates that geographical marginality can also serve as a unique field for stimulating cultural self-awareness and modern transformation. Taking Shibadong Village as a case study, this paper explores how a typical Miao ethnic village transforms traditional cultural resources into sustainable cultural capital during the dual processes of targeted poverty alleviation and rural revitalization, achieving a transition from “heritage protection” to “value creation.” The study proposes an analytical framework of “cultural activation—value transformation—field reconstruction,” revealing how geographically marginalized villages achieve the living inheritance and innovative transformation of cultural heritage through multidimensional mechanisms such as policy guidance, market integration, community participation, and digital empowerment. The findings indicate that: 1) Traditional culture is not merely a passive object of protection in rural development but can be activated as a core resource for industrial integration and community identity. 2) The modern transformation of cultural heritage relies on the synergistic interaction of policy, market, community, and cultural logic. 3) Geographical marginality, by enhancing cultural uniqueness and local identity, becomes an advantageous condition for building cultural brands and achieving differentiated development. The contributions of this paper are as follows: 1) From the perspective of geographical and cultural interaction, it reveals the dynamic mechanisms of cultural heritage protection in underdeveloped regions. 2) It proposes an analytical framework for cultural activation and value transformation, expanding the theoretical paradigm of cultural heritage protection. 3) It provides a replicable cultural development path and governance insights for traditional villages in underdeveloped regions.



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**C24.08-Cultural Geography, Society and Heritage =>
Global Science and the Geographies of Knowledge. 1.
From the Classroom to the Field: Negotiating Global
Norms and Local Practices in Geography.**



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2220 - Teaching From Local To Global At University The Search For A ‘useful’ Compromise

Nathalie Lemarchand¹

Igu - Paris 8, Geography, Paris-France ¹

This communication forms part of a publication project that explores questions surrounding the production of geographical knowledge in the context of increasing standardisation resulting from the globalisation of knowledge. While there is no doubt that globalisation promotes scientific exchange, concerns that have been present from the outset have recently grown in various disciplines and scientific circles. The issue is not communication, which takes place in English, but the production of knowledge itself. Researchers must negotiate the publication of their research and their university teaching between local contexts and situations, and international production and dissemination. The registers are not the same; it is not a question of translation, but of transposition. While my reflection certainly starts from the French context, it is also rooted in practice and activity on continental (European) and global scales.

Our objective here is to engage in a reflective exercise aimed at determining the adaptations and choices between local and global approaches that will ensure that geography training enables new geographers to respond to the local challenges posed by local actors and contexts, while contributing to the renewal of the discipline at the international level.

Since 1998, geography training in French universities has followed the Bologna Agreement or Process and the use of the ECTS credit system, which aims to promote student exchanges (Erasmus) within Europe. At the same time, the push for more international and interdisciplinary scientific collaboration has also contributed to changes in the content of geography courses, as in all disciplines. International scientific collaboration and exchange are not new, and analysis of them from a decolonial perspective has already highlighted the significant adaptation that has accompanied them (Brisson 2025). More broadly, the forms and consequences of the intensification of the dissemination of research results based on an increasingly standardised, even globalised, international model have been questioned (Poell et al. 2024, Gingras 2014).



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2659 - Place Attachment Examining Cultural Interactions

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This paper seeks to address the tension between global science and local research practices with a particular focus on the ways that culture and language mediate, constrain, or enrich geographical knowledge. As a cultural geographer, we focus on cultural interactions within different sociological, political and geographical spaces. In doing so, we challenge the use and the scope and limits of multiculturalism as a global concept and conception of cultural interactions.

Recent trends in the social sciences pose that cultural diversity within a set territory is universal, historically and even more so nowadays. That is, in this day and age, as metropolization has transformed space and places, where globalization, migration and technological advances have disrupted human beings' special relationship to places; when the transformations of places make people feel they lose their sense of place; or when some people find no sense of place. In global (social) science, multiculturalism has become a normative conception of cultural interactions within a sociological, political and geographical space. Our project is to question the value and limits of this global conception of cultural interactions in going back to what "being from a place" or "place attachment" means, in different contexts, and what it entails for cultural interactions. Implicitly, questioning what "being from a place" also reveals why someone is said, "not to be from the place."

Pairing: Being originally from North America and having made a living in Europe, we look to examine cultural interactions, ideally not from those two continents, although there are so many different settings in those places, especially in Europe.



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2750 - A Dialogue Between Geographers On Digital Space

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For nearly three decades, digital technologies have profoundly transformed the ways in which space and territories are conceptualized within geography. They have reshaped modes of social organization, altered everyday practices, and introduced new actors and power relations on the international stage. As digital technologies have become ubiquitous in daily life, they increasingly challenge the foundations of geographical analysis. In particular, they raise questions about the relevance of place, which often appears to be diluted or even erased in favor of a supposedly homogeneous and interconnected “global village.”

This paper seeks to critically examine this perceived digital homogenization and the ways in which digital space is understood, conceptualized, and studied within the discipline. To do so, it proposes a dialogue between a French geographer and an American geographer, focusing on comparative approaches to the geopolitics of digital space in France and the United States. Through this transatlantic exchange, the paper aims to highlight both shared analytical frameworks and significant divergences in viewpoints, theoretical perspectives, and methodological choices.

By confronting these different traditions of geographical thought, this dialogue underscores the fact that digital space, while often presented as global and placeless, is interpreted through diverse academic, cultural, and political lenses. Ultimately, the paper argues that understanding the geopolitics of digital space requires attention to these multiple ways of apprehending and analyzing the digital world.



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**C24.08-Cultural Geography, Society and Heritage
=> Grounding the Planetary: Place-Based
Knowledge, Creative Collaboration, and Geography's
Interdisciplinary Futures**



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2126 - Olfactory Tourism And Ecological Monitoring Of Ancient Trees A Chemical β Diversity Approach

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Ancient trees, as forestry living heritage, embody both cultural symbolism and long-term ecological functions. However, current ecotourism assessments often emphasize human-perceivable experiences, overlooking the invisible ecological roles of these trees, especially during non-flowering or low-odor periods.

This study proposes a dual-layer framework of “explicit olfactory boundaries” and “implicit ecological boundaries,” using the Jinling Sweet Osmanthus King (on Zijinshan) Natural Heritage Site of Nanjing as a case. The explicit layer is defined by the minimum detectable concentration (MDC) of VOCs/BVOCs for human olfaction, shaping the spatial range of olfactory tourism. The implicit layer is determined by the chemical sensitivity thresholds of ecological receptors such as insects, fungi, and microorganisms, which respond to ancient trees’ VOC emissions to mediate pollination, symbiosis, enemy recruitment, and stress signaling.

By integrating plant chemical β -diversity, multi-season VOC profiling, and spatial diffusion modeling, the study develops a parallel evaluation system linking ecological monitoring with olfactory tourism. In this framework, stable scent profiles become intuitive indicators of ecological health, allowing ancient trees to “speak” their condition through smell. This translation of ecological data into sensory experience transforms tourists from passive observers into engaged participants in heritage monitoring and environmental interpretation.

Furthermore, the framework provides an innovative pathway for embedding real-time ecosystem signals into public ecotourism narratives—bridging aesthetic experience with invisible ecological processes. It supports dynamic recreational zoning, ancient tree health tracking, and immersive environmental education. Ultimately, it offers a replicable and interpretable model for integrating chemical ecology with sustainable tourism development, contributing to the conservation and activation of forestry living heritage.



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2485 - Flying To Istanbul Musicking Wandering And The Geography Of Ordinary Encounters

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Background / Hypothesis

This presentation examines sound-based wandering as a place-responsive spatial practice and explores how musical performances inspired by local environments generate ordinary yet meaningful encounters in public space. Based on practices by the authors as performers, the study investigates how sound emerges through engagement with the natural settings, historical layers, and cultural atmospheres of specific places.

Materials and Methods

The authors compose and perform Irish/American based music on site, drawing inspiration from local climate, landscapes, historical memories, and local culture encountered in each location in 2020-25. Sound is thus produced as an improvised response to place rather than as a portable or universal musical work. Musical performance itself is treated as a place-based method of geographical inquiry grounded in embodied experience.

Results

We demonstrate that such place-inspired performances transform ordinary public spaces into sites of encounter through varying degrees of engagement. Passersby who would normally remain strangers may stop, listen attentively, smile, or appear visibly relaxed. In some cases, individuals choose to remain for longer periods, share the atmosphere of the place, or even join the performance. These interactions occur largely without verbal exchange and are enabled by sound's immediate physical and affective presence. The performances reveal how sound momentarily reconfigures spatial relations, allowing diverse individuals to share space through embodied attention, emotional resonance, and collective participation.

Conclusions

This involves sensing social atmospheres, anticipating potential responses, and responding to the subtle boundaries between acceptance and rejection in public space. Such situational judgment is cultivated through experience and cannot be reduced to algorithmic decision-making.

By conceptualizing sound-based wandering as a method responsive to the natural, historical, and cultural specificities of place, this study contributes to geographical discussions of encounter, affect, and ordinary public life, emphasizing performance as a mode of place-based knowledge production beyond institutionalized cultural settings.



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2565 - Territorial Legacy And Protected Areas Transcalar Perspectives From Stelvio National Park **Francesco Antonelli ¹**

University Of Bergamo, Lingue, Letterature E Culture Straniere, Mantello-Italy ¹

In geographical studies, nature is conceived as the world made livable for human life, where individuals act according to its random processes, employing intellectual, material and sensitive control (how theorized by the Italian geographer, Angelo Turco), and giving rise to different forms of material and immaterial appropriation: some oriented to support natural dynamics, others marked by extractive and predatory logics. In this era of the Anthropocene, a word coined by Paul Jozef Crutzen, Dutch meteorologist and atmospheric chemist, we are observing an impact of human action on ecosystem stabilities, which require a critical reflection on new forms of terrestrial coexistence. The creation of protected areas, as in the case of the Stelvio National Park (Northern Italy), represents a strategy to define a dynamic balance among nature protection and territorial development. This strategy defines a relational harmony between humans and non-human components for responding to climate change. More than ninety years after the establishment of the Park in an Alpine context, characterized by high ecological fragility and significant anthropogenic pressures, this paper aims to analyze its legacy, the set of lasting effects, material and immaterial, produced with a process of territorialization, oriented towards care and conservation. By integrating the analysis of cartographic and written sources with GIS tools and field surveys, adopting a transcalar and diachronic point of views. The different legacies are studies such as the environmental one, directed to the conservation of biodiversity and improvement of the quality of alpine ecosystems, institutional with the function of strengthening new forms of governance between territorial actors, and socio-cultural, for an increase in the sense of belonging and for the development of knowledge.



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C24.08-Cultural Geography, Society and Heritage => Heritage, Museum and Innovation



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1037 - The Evolution Of India's Handloom Industry Shifting Of Concepts And Perspectives

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The evolution of India's handloom industry narrates a story of cultural identity, colonial disruption, economic transformation, and ideological reconstruction. Tracing its origins to the Vedic period, the handloom sector has served not only as a means of livelihood. It has also been regarded as a powerful cultural symbol, closely tied to regional identities and artisanal traditions. This paper examines the evolution of the handloom industry across four key historical phases: British colonization, post-independence socialism, economic liberalization, and contemporary globalization. Analyzing cultural symbolism and nationalist resistance to commodification and elite appropriation. The paper examines how shifting ideologies from socialism to capitalism, and from Fordism to post-Fordism, have redefined the meaning, value, and visibility of the handloom in India. Ultimately, the handloom industry is presented as a dynamic cultural landscape interwoven with culture, labor, identity, and place, requiring deeper structural engagement beyond its sustainability. As the preceding analysis reveals, this sector cannot be understood merely through binary lenses of decline or survival, tradition or modernity, but rather as a dynamic cultural landscape concept borrowed from Carl Sauer, where historical memory, place-based practices, and systemic transformations continuously interact. In sum, the Indian handloom industry today is not a relic of the past but a living system, an interface between culture and capitalism, tradition and innovation, resilience and vulnerability. Once it was time, when the industry was considered to be the utmost significant in the past, now it is considered to be a dying industry. The one who has been suffering the most is the weavers engaged in this industry. To come out of the trap of capitalism, people are moving out of the sector, shifting mostly to the tertiary activity. Leading to a decline in weavers and production in the handloom sector. Moving forward, any genuine revitalization must go beyond aesthetic appreciation or ethical branding to address deeper structural questions of labor equity, cultural authorship, and inclusive economic models. Only then can the handloom industry sustain both its historical legacy and future relevance. Though the revival of traditional industries has been taking place with the concept of Made in India.



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1569 - Cognitive Mapping And Map Making An Alternative Digital Model Of Urban History Museums

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Conventional digital heritage models for historic urban districts often prioritise physical accuracy and expert narratives, marginalising the everyday history and lived memories of communities. This approach limits digital media's capacity to convey the temporal depth, social plurality, and evolving meanings of these environments in museum and interpretation contexts. In response, this study proposes an alternative digital model for interpreting and presenting urban heritage that reframes the digital museum as an active medium for meaning-making rather than a static container of information.

Adopting a Research through Design (RtD) approach, the study introduces a dual framework of cognitive mapping and map-making to support community-centred, narrative-based heritage interpretation. This framework reconceptualises authenticity not as a fixed attribute of physical form, but as an experiential and relational construct emerging from the interaction between spatial configuration, collective memory, and narrative exploration across time.

The framework is examined through the Dongsì Virtual Museum project in Beijing, where a Digital Cognitive Twin (DCT) of a historic neighbourhood was constructed by integrating spatial data with archival materials and oral histories. The virtual museum environment enables multiple temporal layers, fragmented memories, and everyday narratives to coexist, allowing users to navigate urban heritage through both spatial cognition and narrative association. Findings indicate that cognitive mapping effectively captures the complex, non-linear, and multi-layered temporal narratives spanning different historical periods of the district, thereby expanding prevailing notions of authenticity in digital heritage interpretation.

Theoretically, this study establishes an innovative digital heritage interpretation framework that bridges spatial cognition, narrative expression, and museum studies. Practically, it demonstrates the feasibility, credibility, and transferability of the framework through design implementation and post-use evaluation. Overall, the study contributes to heritage and museum innovation by presenting a community-centred, narrative-rich digital model that advances participatory and pluralistic approaches to urban heritage interpretation.



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2335 - Integrating Intangible Cultural Heritage Into Curriculum Based Ideological Education For Tourism Management Majors In Chinese Ethnic Regional Universities A Cultural Identity Perspective

Linwei Yan¹, Judong Qin¹, Fuwei Wei¹, Haidong Liang¹, Xiaoying Han¹

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This paper is based on the perspective of cultural identity. It closely aligns with two major national strategies of China, namely the inheritance of intangible cultural heritage and the curriculum-based ideological and political education. It is supported by the theory of ethnic interweaving and behaviorist teaching theory, and integrates the post-positivist paradigm with quantitative research. Taking the tourism management students of China's representative universities in eight major ethnic regions (i.e., Xizang Autonomous Region, Xinjiang Uygur Autonomous Region, Guangxi Zhuang Autonomous Region, Inner Mongolia Autonomous Region, Ningxia Hui Autonomous Region, Yunnan Province, Guizhou Province, Qinghai Province) as samples, it explores the specific paths to integrate elements such as patriotism, ethnic unity, and craftsmanship spirit contained in intangible cultural heritage into ideological and political education in universities. By incorporating cultural identity education into teaching objectives, the research constructs the instructional model and the integration mechanism for transforming intangible cultural heritage into ideological and political education resources. It also addresses core issues such as instructional design and practical implementation in the integration process. The aim is to achieve mutual reinforcement between intangible cultural heritage inheritance and curriculum-based ideological and political education, thereby laying a solid foundation for enhancing the cultural identity of students in ethnic region universities and strengthening the sense of community of the Chinese nation. The result indicates that the intangible cultural heritage inheritance has a direct impact on the effectiveness of ideological and political education in higher education institutions, as well as on the cultural identity of students majoring in tourism management. Additionally, the efficacy of ideological and political education mediates the relationship between intangible cultural heritage inheritance and cultural identity.



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2348 - National Identity Reinforced Through Museum Tourism

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This study examines how tourists' national identity is reinforced through museums tourism within a post-colonial context. Employing Interaction Ritual Chains Theory, the research adopted a go-along method with 45 tourists and follow-up interviews with 20 participants. The findings indicate that exhibition narratives interact with tourists' individual emotions in ritualized spaces, transforming dispersed affective energy into rhythmic collective emotional flows that generate collective effervescence. This process produces three potent forms of national identity at collective level: group solidarity, social cohesion, and moral indignation. Post-visit, collective national identity becomes internalized and consolidated through individuals' cognitive reframing, emotional sedimentation, and social sharing. Theoretically, it contributes in three dimensions: by proposing the concept of "programmed catalysis" to decode the curatorial engineering of ritual efficacy; by operationalizing "moralized affective sequences" to trace the systemic conversion of diffuse emotions into collective belonging; and by modeling the full interaction ritual chain to elucidate the long-term process of internalization. Methodologically, the study employs a longitudinal design that integrates go-along method with phased follow-up interviews, holistically documenting the diachronic transformation of tourists' subjectivity. The research not only provides theoretical principles for designing heritage exhibitions that foster critical engagement but also establishes a robust analytical framework for comparative studies on the politics of memory and identity across diverse postcolonial contexts.



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2352 - A Study On The Development Of Wellness Tourism Products Based On The Twenty Four Solar Terms Of China's Intangible Cultural Heritage A Case Study Of Bama Yao Autonomous County

Linwei Yan¹, Judong Qin¹, Fuwei Wei¹, Rongjuan Huang¹, Hongling Liu¹

Hechi University, Business School, Hechi-China¹

As one of the most important traditional Chinese intangible cultural heritages, the Twenty-four Solar Terms comprehensively embodies the indigenous Taoist philosophy of “harmony between humanity and nature,” which permeated various aspects of ancient Chinese society, from state governance to humanistic values and lifestyle customs. While its role as a calendrical system has diminished in contemporary times, the socio-ethical concepts it embodies remain deeply rooted in the cultural identity of the Chinese people. This paper innovatively establishes a theoretical framework for traditional Chinese wellness tourism products based on the Twenty-Four Solar Terms health preservation techniques, the Push-Pull Theory, and the RMP (Resource-Market-Product) Theory. This quantitative research employed a post-positivist paradigm with non-probability convenience sampling to collect paper-based questionnaires, which were coded for data analysis, resulting in a total of 346 responses. The findings suggest that traditional Chinese wellness resources and transportation infrastructure have a direct impact on the perception of wellness tourists. When developing health and wellness tourism products based on the Twenty-four Solar Terms Guiding method, it is essential to leverage local resources and the traditional Chinese concept of “harmony between humanity and nature,” aligning product offerings with agricultural cycles to introduce locally distinctive tourism experiences that encapsulate Taoist health-preservation principles.



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2401 - The Construction Of Chinese Tourists' Geographical Imagination Of Uzbekistan's Cultural Heritage Cities A Media Geography Perspective

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Abstract: This study adopts the theoretical perspective of media geography to explore the construction process of Chinese tourists' geographical imagination of Uzbekistan's cultural heritage cities (such as Samarkand, Bukhara, and Khiva) and its interactive relationship with tourism practices. Focusing on the central role of media in shaping cross-border tourism cognition in the digital age, the research aims to reveal how Chinese tourists' geographical imagination of Uzbekistan is produced and disseminated through media representations, and ultimately consumed, negotiated, and reproduced during on-site experiences.

The study employs a mixed-methods approach. First, through netnography, it systematically collects and analyzes textual, visual, and video content from mainstream Chinese travel and social media platforms such as Xiaohongshu, Douyin, and Mafengwo, deconstructing the dominant images of Uzbekistan constructed by media across three dimensions: thematic narratives, visual rhetoric, and emotional tone. The findings indicate that media predominantly portray three interwoven geographical imaginations: the historical nostalgia of the "living fossil of the Silk Road," the exotic romance of the "Arabian Nights fairy-tale town," and the visual consumption of the "photography paradise." Second, through in-depth interviews and participant observation, the study traces the entire process of tourists' experiences—from pre-trip expectations and on-site engagement to post-trip sharing—analyzing the tensions between media imagination and tourism practices. The research reveals that tourists' on-site behaviors largely follow or even perform media scripts, yet they also encounter "representation gaps," such as the impact of commercialization and the lack of authentic lived experiences, which trigger reflection and revision of established imaginations.

The primary theoretical contribution of this study lies in applying media geography to tourism research on countries along the "Belt and Road" initiative, specifically elucidating the dynamic construction mechanism of cross-border geographical imagination within the "media representation-tourist practice" cycle. This deepens the understanding of the new forms of the "tourist gaze" in the digital media era. In practical terms, the study provides insights for Uzbekistan's tourism management authorities to refine destination image positioning and communication strategies targeting the Chinese market. It also offers guidance for encouraging Chinese tourists to engage in more reflective and in-depth cross-cultural tourism practices.



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2425 - Governing Difficult Pasts How European Heritage Initiatives Shape Totalitarian Legacies

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This article examines how European-level heritage initiatives convert the totalitarian and especially communist legacies of Central and Eastern Europe into publicly accountable value, reframing a cultural and moral issue as a problem of policy design and implementation. Through a structured, focused comparison of the European Heritage Label, the House of European History and selected Cultural Routes of the Council of Europe (including sites in Poland, Hungary, Romania, Czechia/Slovakia and the former GDR), it analyses how these programmes narrate state socialism, repression, resistance and everyday life in the former socialist bloc. Combining three lenses—normative legitimacy, Europeanisation as discursive institutionalisation, and memory politics—with critical discourse analysis of programme materials, the article theorises “memory governance” as an Ends–Narratives–Instruments triad. Three findings follow: (1) credibility rests on reflexive narration that pairs responsibility with suffering and avoids one-sided victimhood; (2) Europeanisation travels via micro-instruments—applications, captions, templates and wayfinding—diffused by transnational communities of practice; and (3) participatory designs that enable “productive friction” between local, national and European memories outperform spectacle-driven approaches and checklist compliance. The article contributes a portable evaluation framework for assessing heritage interventions dealing with communist and totalitarian pasts, design prompts for co-curation and multilingual mediation, and guidance on inter-institutional choreography across EU–Council of Europe ecosystems in post-socialist Europe.



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C24.09-Dynamics of Economic Spaces => Digitalization and Employment: Challenges for Inclusion and Diversity in the Industry 4.0 New Spatial Configurations



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1213 - Adoption Of Industry 4.0 Technologies And Their Impact On Employment The Example Of The Hungarian Industry

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Since 2011, when the concept of Industry 4.0 appeared, but especially in the last decade, new technologies have been spreading relatively rapidly in the manufacturing industry. In parallel with the acceleration of digitalization, automation and robotization, significant changes can be experienced in the economy and society. It can also be assumed that the quantity and quality of the workforce will change, as new expectations will emerge for the workforce and new skills and competencies will be required. Previous literature also confirms that not only the number of employees is changing, but also their composition. The main aim of the presentation is to explore how the spread of new Industry 4.0 technologies in Hungarian industry affects the number and composition of employees. Using national and corporate (macro- and micro-level) data sets and empirical research data, we also seek an answer to the question of how changes in digitalization and employment affect the spatial structure of industry. Due to the various approaches, it became obvious that although significant progress has been made in the application of new technologies in Hungarian industry in recent years, which depended significantly on company characteristics, the number of employees has not changed significantly at the macro level. At the same time, at the micro level and depending on the sector there may be more significant differences, which can also be clearly observed in space. The aim of the project (NKFIH K 125 091) within which this research was conducted is to explore new trends in Hungarian industry.



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1810 - Global Production And Disassembly Networks Work Workers And Waste

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The volume of waste generated across the planet seems to be ever increasing, with little end in sight. Given this, in recent years growing numbers of voices have called for the creation of circular economies in which waste can become inputs into new products. For some this is about protecting the environment whereas for others it is about not letting potentially valuable resources literally go to waste. We explore circularity here through the concept of Global Disassembly Networks (GDNs). We see GDNs as Other to Global Production Networks (GPNs). Thus, whereas GPNs are all about putting commodities together, GDNs are where they are taken apart so as to retrieve useful components that can be reused. Specifically, we focus upon how various labour practices shape how GDNs are structured and how this, in turn, structures how GPNs work. We highlight that much of the work conducted in GDNs is done by so-called ‘informal workers’, even as what they secure is incorporated into new products within the ‘formal economy’. This challenges longstanding binaries of ‘formal’ and ‘informal’ labour practices. To make our argument we examine recycling and labour practices in several sectors, including e-waste, paper recycling, the disassembly of ships, and the global trade in used cars.



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2071 - Robot Density And Intensifying Digital Divergence In The Republic Of Korea

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Research Backgrounds

This paper aims to examine the paradox that the Republic of Korea (hereafter ‘Korea’) has achieved the world’s highest level of robot density in manufacturing while experiencing intensified sectoral, firm-level, and regional disparities in terms of digital divergence. The core hypothesis is that Korea’s smart factory–led digital transformation policy failed to address pre-existing industrial, corporate, and regional capability gaps at an early stage. These unresolved gaps became path-dependent and were subsequently amplified through the adoption of robots, resulting in reinforced structural divergence.

Materials and Methods

The analysis covers the period from 2000 to the present and draws on multiple sources, including International Federation of Robotics (IFR) statistics, Korean government policy documents on smart factories and manufacturing innovation, industrial and firm-level robot adoption data, and academic and policy studies on labor markets. Robot density was examined across industrial sectors and spatial scales, including metropolitan regions, local governments, and industrial complexes. Firm size categories—large firms versus small and medium-sized enterprises (SMEs) were also compared. Changes in local labor markets were analyzed with a focus on age cohorts, employment types, and wage structures.

Results

The findings reveal that Korea’s exceptionally high robot density is heavily concentrated in electronics, semiconductors, and automotive industries, as well as in large conglomerates. In contrast, SMEs and traditional manufacturing sectors exhibit significantly lower levels of robot adoption. Robot utilization is spatially concentrated in metropolitan regions with major industrial hubs, while non-metropolitan areas with weaker industrial bases lag behind. These disparities in robot density have generated multiple labor market divides in local economies, including generational employment gaps, dualization of employment types, and widening wage differentials.

Conclusion

This paper conceptualizes Korea’s robot density divergence as a path-dependent outcome of smart factory–centered digital transformation. Robot utilization in Korea has largely remained within a mass-production system, emphasizing production-capacity enhancement rather than human–robot collaboration. It concludes by emphasizing the need to establish new multi-level governance frameworks that link industry, labor, and education within local labor markets.



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2662 - Contested Dwelling In Place A Political Ecology Of Agro Industrial Communities Surrounding The Southern Taiwan Science Park

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The establishment of the Southern Taiwan Science Park (STSP) has precipitated dramatic landscape transformations in the surrounding areas. In Shanhua District, Tainan, the interweaving of incoming technology-sector families and traditional agricultural communities has produced a paradoxical condition of spatial proximity coupled with social segregation. Drawing on the ethics of care perspective within political ecology, this study conceptualizes such social segregation not merely as a product of sectoral disparities, but as a spatial manifestation of resource allocation and the politics of community.

We observe a systemic erasure of rural landscapes: the progressive silencing of village broadcasting systems, the transformation of labor resources for farmland cooperation, and the atrophy of traditional markets. These soundscapes and landscapes, which carry local memory and knowledge, once served as critical infrastructure for intergenerational communication and community mobilization. Their disappearance occurs in tandem with the digital transformation of information access and civic participation.

This reconfiguration of landscape and social space compels old and new generations to renegotiate the terms of coexistence in the absence of shared physical sites of interaction. However, when the communication channels and knowledge transmission practices familiar to elderly generations become marginalized, while digital participation modes dominated by technology newcomers remain disconnected from the former, limited engagement persists. Yet residents from different industrial sectors and generations are gradually forging connections through everyday practices of living, eating, education, and care. This research attends to how different types of communities—from technology newcomer households to traditional agricultural settlements—develop responsive life strategies through caring for diverse groups within shared living spaces.



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C24.09-Dynamics of Economic Spaces => Dynamics of Entrepreneurship in Different Contexts



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1376 - Do Sectoral Specialization And Industrial Diversity Matter For Regional Entrepreneurship In Türkiye

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Beside bringing sociological and institutional factors based explanations into the forefront, entrepreneurial ecosystem framework or the systemic approach to entrepreneurship makes it possible to interpret entrepreneurship through its spatial context. In this regard, alongside other social and cultural conditions of places, the spatial configuration of economies and spatial externalities can be mentioned as distinguishing features of the spatial context. As one of the endogenous characteristics of regional economies, especially the levels of sectoral specialization and local industrial diversity are considered as non-negligible structural characteristic of entrepreneurship ecosystems. Indeed, the literature draws attention to the positive relationship between industrial diversity and the level of regional entrepreneurship.

Departing from this logic, this study aims to analyze the effect of sectoral specialization and industrial diversity on entrepreneurship at the provincial level in Türkiye. By doing so, the study seeks to answer the question of whether regional specialization and clustering externalities or industrial diversity are more effective at the regional entrepreneur level. In this context, the number of new firm creations in provinces between 2013 and 2024 is taken as an indicator of entrepreneurship and the role of specialization and sectoral diversity on this outcome variable is tested via using a linear analytic model. Within the scope of the study, the role of industrial diversity is analyzed in both related variety and unrelated variety. This helps to find answer for the question of whether the type of knowledge and skills supporting entrepreneurship at the provincial level is homogeneous or heterogeneous. Additionally, it reveals if related variety promote sectoral cross fertilization within entrepreneurial ecosystems in case of Türkiye. In this respect, the study draws attention to the spatial context of entrepreneurship and helps to comprehend entrepreneurship dynamics in non-technology based economies of developing countries.



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1566 - Identifying Hidden Champion Firms And Towns And Their Socio Economic Performance

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In regional and economic development research, there is an “unlikely winner” that, according to most theories, should not exist. These towns—sometimes referred to as hidden champion towns—tend to be small and peripheral, located outside major urban agglomerations, yet they host disproportionately successful firms that compete globally, here referred to as hidden champion firms.

In this presentation, we will identify hidden champion towns—smaller, peripheral towns that host disproportionately successful, export-oriented firms. We will introduce the theory of hidden champion firms and discuss the geography of home-grown firms that are larger, export-oriented, and possess a high capacity for innovation. We will present the criteria used for their identification and map their spatial distribution in Slovenia.

In the second part of the presentation, we will examine whether the presence of hidden champion firms influences local socio-economic development. In particular, we are interested in whether the presence of large, export-oriented firms affects the well-being of the local population, including wages, housing conditions, health, and environmental quality.

We will present a quantitative methodology for assessing the socio-economic performance of hidden champion towns and address the following research questions:

RQ1: How common are hidden champion firms in small towns (population < 30,000)?

RQ2: Do small towns (pop < 30,000) with hidden champion firms perform better economically than comparable towns without them?

RQ3: Do small towns (pop < 30,000) hosting hidden champion firms exhibit significantly different socio-economic structures than those without such firms?

RQ4: Can different types of hidden champion towns be distinguished, and can a typology be developed based on their socio-economic performance?

The main goal of this research is to link firm-level economic performance with broader local and regional development outcomes. In economic geography, this relationship is often taken for granted, with the assumption that strong firm performance automatically translates into positive local socio-economic development. However, this study aims to uncover the nuances of the relationship between economic actors and the wider development trajectories of local communities.



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1867 - A Critical Examination Of Transnational Entrepreneurship In Colonial Contexts The Rise And Demise Of Japanese Pharmaceutical Firms In Colonial Korea 1920–1945

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In recent years, interest in transnational entrepreneurial networks and activities has grown within the field of economic geography. However, much of the existing literature assumes stable relationships between entrepreneurs' home and host countries and has paid insufficient attention to the possibility of abrupt political and institutional change. By contrast, periods of international instability in the past were often characterized by transformations of national frameworks. Analyzing such historical cases therefore offers important insights into the dynamics of transnational entrepreneurship under conditions of uncertainty.

This paper examines the expansion of Japanese pharmaceutical entrepreneurs into colonial Korea in the early twentieth century and traces their subsequent trajectories. In particular, it focuses on how entrepreneurs formed networks amid the reconfiguration of relations between the imperial metropole and colonial society. The establishment of Japanese-style pharmaceutical regulations and pharmaceutical education institutions in the colony, together with the disruption of pharmaceutical imports from Europe caused by the First World War, created favorable conditions for the emergence of a Japanese pharmaceutical manufacturing industry in colonial Korea during the 1920s. As the number of Japanese pharmaceutical firms increased, mutually supportive networks developed between these firms and pharmaceutical companies in Japan proper. With the intensification of the Second World War, however, the empire increasingly required Japanese pharmaceutical firms in colonial Korea to contribute to the wartime economy. As state control intensified, these firms gradually lost managerial autonomy, and their entrepreneurial networks and activities were forced to transform into forms compatible with the imperial wartime economic system. Following Japan's defeat, they were ultimately compelled to abandon all of their business operations.

This historical analysis suggests that while international entrepreneurial networks can function effectively in promoting business development under unstable conditions, they are also strongly affected by state and administrative intervention, which can at times threaten the very continuity of enterprises.



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1979 - Independent Fashion Brands As Agents Of Change Towards Sustainable Fashion Evidence From Polish Smes

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Background/Hypothesis

Implementing SDGs poses significant challenges for the fashion sector. Independent fashion designers and small producers embedded in local contexts are often perceived as well positioned to follow sustainable fashion practices. The paper hypothesises that Polish independent fashion SMEs engage with sustainability in a multidimensional manner, shaped by their professional identities and local ecosystems.

Materials and Methods

Semi-structured, in-depth interviews with 33 independent fashion designers were conducted in 2020-2024. The analysis of their content focused on perceptions of sustainable fashion, implementation strategies across the value chain, cooperation with local ecosystem actors, perceived challenges and factors influencing entrepreneurial and location strategies.

Results

Sustainability-related practices are omnipresent in the activities of independent fashion entrepreneurs in Poland, even though they are often developed intuitively rather than through formalised strategies or certification schemes, and are not always articulated explicitly promoting a brand as sustainable. They are embedded in routine creative and managerial decisions and concern multiple stages of the fashion value chain. Respondents demonstrate awareness of the multidimensional nature of fashion sustainability, including its ecological and ethical dimensions. However, the study reveals significant challenges associated with implementing sustainability principles in small-scale fashion production. These include limited access to reliable, comprehensive information on sustainable practices, widespread concerns about greenwashing in the broader fashion market, consumer awareness and attitudes. Small-scale and localised production is generally perceived as a more responsible alternative to fast fashion, yet respondents emphasise the inherent tensions between commercial viability and ecological responsibility. A typology of location strategies of independent fashion firms is also proposed.

Conclusions

Fashion SMEs can act as important agents of change towards more sustainable fashion. Recognising the multidimensional and spatially embedded nature of sustainable fashion entrepreneurship is crucial for advancing both research and policy in this field.



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2027 - Startup Location Patterns Based On Geographic Proximity To Startup Support Facilities In Seoul

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Following the second venture boom, Seoul's startup ecosystem has experienced remarkable growth, largely attributed to the city's startup support policies, particularly improvements in startup infrastructure. Policy efforts centered on expanding startup support facilities can be understood as changes in the business environment faced by startups. In response, startups adopt various strategies to adapt to or overcome such environmental changes, among which firm relocation represents a key spatial strategy. Firm relocation refers to the transfer of all or part of a firm's operations to a new location and reflects an entrepreneurial spatial adjustment to external environmental change rather than a mere change of address (Brouwer et al., 2004). Startups, characterized by uncertainty in internal resources, rely heavily on external resources to respond flexibly to dynamic business environments. In this process, geographic proximity plays a critical role in facilitating effective resource exchange. Startups acquire essential resources through various support organizations, and venture capital firms in particular exhibit strong spatial clustering and a pronounced preference for geographically proximate investment opportunities due to their need for active monitoring of portfolio firms. Previous studies suggest that geographic proximity to support institutions is especially important for early-stage firms and is more pronounced in service-based industries than in manufacturing. Against this background, this study examines startup location patterns in Seoul by focusing on the spatial relationships between startups and startup support facilities. Specifically, it addresses two research objectives: (1) to analyze the spatial distribution of startups and startup support facilities in Seoul, and (2) to examine industry- and firm-age-specific location patterns in relation to proximity to support facilities. While prior studies have largely adopted a static perspective emphasizing initial location choice, this study focuses on dynamic location changes associated with firm growth. The results show Seoul's policy context rather than the early-stage proximity patterns emphasized in prior studies. Overall, the findings demonstrate that policy contexts can significantly shape startup relocation patterns, highlighting a distinctive clustering structure formed through the interaction between policy-led infrastructure provision and startup spatial demand.



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2089 - Intersectionality And Multi Level Spatial Embeddedness In Entrepreneurial Ecosystems

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Entrepreneurial ecosystems are often portrayed as place-based configurations of finance, knowledge, networks, and institutions that foster venture creation and economic development. Yet ecosystem and embeddedness research still frequently treats “the entrepreneur” as a generic actor and “context” as a stable backdrop, downplaying how access to ecosystem resources is uneven, contested, and changing. Building on my previous research on intersectionality and entrepreneurship, this paper asks how intersecting identities and life-course positions shape entrepreneurs’ ability to access, translate, and mobilize ecosystem resources across spatial scales and over time.

I develop the concept of Intersectional Multi-level Spatial Embeddedness (IMSE). Entrepreneurs are simultaneously embedded in intersecting social locations (e.g., gender, class, ethnicity/race, migration status, sexuality, disability, and family roles) and in layered spatial contexts (everyday neighbourhood relations, local intermediary organizations, city-regional governance, national policy regimes, and translocal or transnational networks). IMSE treats embeddedness as processual and dialectical: the same ties and institutions that enable entrepreneurship can also constrain it, and entrepreneurs respond by reworking relationships, routines, and geographies.

Methodologically, I combine an intersectionality-informed qualitative approach with multi-level contextual mapping. The analysis draws on in-depth interviews and life-history narratives with entrepreneurs recruited through intersectional sampling (to capture varied, intersecting social positions rather than single-axis categories) in European cities, complemented by interviews with ecosystem “gatekeepers” and intermediaries.

The analysis specifies three IMSE mechanisms. First, selective visibility: legitimacy and “fit” are assessed through informal norms that intersect with identity and biography, shaping invitations, mentoring, and funding. Second, cross-scale resource filtering: programmes designed at higher scales translate unevenly into locally usable support, generating administrative, linguistic, and cultural frictions that differentially burden some founders. Third, strategic re-embedding: entrepreneurs “scale out” via platforms, diaspora ties, associations, or cross-regional intermediaries to bypass local barriers and recombine resources.

By foregrounding intersectional difference and multi-scalar process, the paper reconceptualizes embeddedness as temporally evolving across spatial layers, shows how ecosystems can simultaneously enable and exclude, and derives implications for inclusive ecosystem policy that targets gatekeeping and



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2604 - Rethinking Craft Geographies Investigating Relational Dimensions Of Craftsmanship Through Cymbalsmiths Of Istanbul

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Background

There has been an ambivalent relationship between economic geography and craft geographies. The interest in craftsmanship is mostly external and instrumental in building industrial cultures. This creates a theoretical gap, leading studies to often omit the internal dynamics of survival and coexistence mechanisms in various craft geographies.

Methodology and Materials

This study proposes to revisit the relational framework to fill this gap. Relational economic geography enables down-to-earth approaches and offers a useful toolkit acknowledging that socially embedded practices and interactions shape economic processes. Using this toolkit, and a “geographical lens”, Bathelt and Glückler (2003) have identified three dimensions of economic action: contextuality, path dependency, and contingency. This conceptualization is taken as a starting point.

Contemporary craft geographies of Istanbul offer a productive field of research in this context with its relational continuities and ruptures. Born in Istanbul centuries ago, the craft of cymbal making has undergone significant transformations and relocated to the USA in the early 20th century. With mass production and developments in the music industry, the factory became one of the dominant powers in the musical instruments industry. However, the legend of “handmade Turkish cymbals” remained with a few workshops in Istanbul, who continue to produce traditionally. Regardless of how little they capture from the overall revenue, they still hold an irreplaceable position. Ethnographic fieldwork is employed to understand this unique existence.

Results

A relational framework is offered for craftsmanship through the aforementioned dimensions. For contextuality, inherited material practices and place-based reputation; for path dependency, the persistence of traditional ways of making; for contingency, the tacit knowledge transmission mechanisms across ethnic boundaries are discussed. Thus, contextuality, path dependency, and contingency are distilled for craft geographies into symbolic thickness, craft persistence, and heritage fluidity.

Conclusion

This study presents a reinterpretation of the relational framework tailored for craftsmanship analysis. It may also play a role in bringing non-Western perspectives into the craftsmanship discourse, opening the ground for further theoretical discussions.



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2613 - Conceptualizing Windows Of Opportunity In Industrial And Regional Development The Case Of The Turkish Bicycle Industry

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Background:

The global bicycle industry has witnessed a number of developments throughout the past decades, including a remarkable market growth, increasing levels of product complexity and know-how, intensifying competition among industry leaders and latecomers, and the emergence of diverse catching-up trajectories. The Turkish branch of the industry has only been able to occupy a marginal position in these developments and has failed to become a fast-follower, despite its sustained export growth and trade surplus. The industry's unstable revealed comparative advantage scores over time show that it has fallen into a middle-technology trap and followed a non-linear pathway, driven by temporary growth spurts and subsequent restructuring processes due to significant, discontinuous events that strongly affected the industry.

Methodology and Materials:

To explain this non-linear development trajectory, we conduct a conjectural analysis and conceptualize the industry's development as one that was fundamentally shaped by discontinuous events and by windows of opportunity that opened up as a consequence.

There are various literatures about windows of opportunity, in fields such as development studies, evolutionary economics and economic geography, which have different, often specific targets in mind and do not speak to each other. They identify different types of windows of opportunity that are only partially linked with each other. While some studies focus on the origins of these windows, others concentrate on their effects. Overall, the roles of triggering events and responses to these events within the industry appear somewhat blurred.

Results and Conclusion:

In this paper, we aim to integrate these literatures into a broader concept of windows of opportunity in industrial and regional development and apply this concept to the Turkish bicycle industry. We identify different types of events that can be intrinsic or extrinsic to the industry and investigate the consequences these windows of opportunity have on industrial and regional development.



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2624 - Autonomy In Community A Multi Scalar Approach To The Professional Practices Of Turkish Architects

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Background/hypothesis: Changes in market conditions have caused professionalism as an organizing principle to become contaminated with logics of entrepreneurship, thus professional workers are forced to exhibit entrepreneurial behavior to capture work. As a trust-based alternative to industrial organizing, communities support professional workers characterized by their high degrees of autonomy in understanding and navigating an otherwise precarious and competitive market. Architecture is a knowledge-based professional service industry with a heteronomous practice culture, which provides a fertile terrain for professional communities to flourish. A considerable portion of Türkiye's economic growth is dependent on construction activities. Architects are under-investigated members at the confluences of this complex, highly segmentized and lively industry; their practices are therefore invaluable sources that provide insight into Turkish industrial dynamics and context.

Materials and methods: Through the lens of practice-based theory, we employ professional autonomy as a research tool to investigate the structures and dynamics of local professional communities within architecture. We conducted semi-structured interviews with 20 licensed architects who are practicing in project management positions at Turkish architecture firms. These firms were selected through referrals with a focus on achieving a representative breadth in specialization types. Meetings lasted between 30-80 minutes and were recorded and transcribed. Data was processed with grounded theory methods.

Results and conclusion: Resulting from our empirical inquiry of professional autonomy, our discoveries are three-fold; (i) Professional autonomy is an intangible, context-dependent asset that is reliant on agents' possession of social resources and their ability to utilize them. (ii) Professional autonomy is observable at multiple scales: the agent, the project and the community level. (iii) A professional service industry can contain several sub-communities based on specialization. Each sub-community contains various degrees of autonomy and presents different contexts and conditions for practice.



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2636 - The Contribution Of The Tourism Oriented Reuse Of Abandoned Mines To The Local Economy The Case Of The Çankiri Salt Mine

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This study analyzes the direct, expenditure-based monetary contribution of the Çankiri salt mine to the local economy within the framework of the visitor expenditure approach, which is widely applied in tourism economic impact studies. This approach conceptualizes visitor spending at the destination as the initial and direct effect on the local economy. Although tourism impacts are frequently assessed using input–output models, social accounting matrices, and computable general equilibrium models, this research focuses solely on the direct expenditure effect due to limitations in data accessibility and reliability. Accordingly, the study adopts a quantitative and descriptive research design. In addition to the relevant academic literature, secondary data obtained from local institutions and organizations were utilized to support the analysis. Primary data were collected from the relevant units of the Çankiri Municipality. Furthermore, official press releases and tourism statistics published by the Turkish Statistical Institute constitute important data sources for the study. The quantitative component of the research model is based on the calculation of direct economic impact using visitor numbers and average per capita expenditure. The direct economic impact (DE) was calculated by multiplying the annual number of visitors (V) by the average per capita expenditure (E) ($DE = V \times E$). Official statements publicly shared by relevant institutions indicating that the Underground Salt City hosted approximately 1.8 million visitors in 2025 were taken as the basis for visitor numbers. The average per capita expenditure level in domestic tourism was used as a reference value. A scenario-based approach was adopted, taking into account that visits to the destination are predominantly day trips, and the calculation framework was structured accordingly. Taxes, infrastructure and superstructure investments, and other cost-related items were excluded from the scope of the analysis. The study aims to demonstrate the potential of abandoned salt mine galleries as an alternative and innovative form of tourism, while also identifying opportunities and threats specific to Çankiri. The findings support development plan objectives emphasizing the mobilization of local resources to strengthen local economies and are expected to provide a foundation for future, more comprehensive research.



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2724 - Sustaining Entrepreneurial Ventures In Marginalized University Student Ecosystems

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Entrepreneurship is a vital driver of economic innovation and employment generation; yet, institutional injustices in Indonesia hinder the potential of university students, especially in marginalized areas such as Eastern Indonesia. This study examines the durability of entrepreneurial initiatives among these students, emphasizing the hurdles they face in shifting from entrepreneurial ideals to viable firms. This research employs the Theory of Planned Behaviour (TPB) and the Resource-Based View (RBV) to identify factors affecting enterprise sustainability, including social support systems, entrepreneurial training, and structural impediments. A mixed-methods approach will be utilized, integrating quantitative surveys of approximately 300 students from five colleges with qualitative interviews to examine the lived experiences of both successful and unsuccessful entrepreneurs. Initial data suggest that more than 90% of student-operated enterprises do not survive beyond the initial stages due to insufficient post-program support, limited access to funding, and cultural constraints. This study identifies significant deficiencies in the literature around student entrepreneurship and corresponds with the United Nations Sustainable Development Goals (SDG 8) by offering practical ideas for improving entrepreneurial ecosystems. This study seeks to promote collaboration among educational institutions, government entities, and the private sector to create a more equitable entrepreneurial environment that supports the ambitions of marginalized university students, thereby contributing to Indonesia's economic growth and alleviating graduate unemployment.



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3183 - Entrepreneurial Ecosystems And Regional Development The Chilean Beer Industry In A Global-local Context

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Understanding how emerging entrepreneurial ecosystems interact with increasingly globalised markets has become a central question in economic geography and regional studies. Many industries today operate simultaneously within global value chains while remaining strongly embedded in specific territorial contexts, generating complex dynamics between global integration and local development. The brewing industry in Chile provides an interesting empirical case to explore these dynamics.

Over the last two decades, the sector has evolved from a relatively concentrated industry dominated by a few large producers into a more diversified ecosystem characterized by the emergence of numerous small and medium-sized breweries distributed across different regions of the country. This transformation reflects broader processes of entrepreneurial experimentation, local innovation and the formation of regional production networks.

This paper examines the economic role and productive structure of the Chilean brewing industry between 2014 and 2021 using input-output analysis and multiplier models derived from national accounts. Drawing on data from the Central Bank of Chile, the National Customs Service and complementary sectoral sources, the study evaluates the direct, indirect and induced economic effects generated by the beer industry within the national economy. From a geo-economic perspective, the analysis explores how an emerging entrepreneurial sector navigates global market pressures while simultaneously reinforcing place-based economic dynamics.

The results indicate that the brewing sector generates significant spillovers across multiple industries, including agriculture, packaging, logistics, hospitality and tourism-related activities. At the same time, the analysis reveals structural challenges, particularly the continued dependence on imported intermediate inputs such as malt and hops. By examining the Chilean beer industry as a case study, the paper contributes to broader debates on entrepreneurial ecosystems, regional development and the relationship between globalisation and localisation in emerging industries.



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3234 - Haze Shrouded Deals Does Air Pollution Matter For Mergers And Acquisitions

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Since the dawn of the 20th century, the concept of sustainable development has gained widespread recognition, bringing environmental issues into sharp public focus and highlighting the intricate links between urban environments and business models. While existing studies have predominantly examined the negative impact of air pollution on tangible economic output, there remains a significant research gap in understanding how air pollution influences corporate investment decisions, particularly in the context of mergers and acquisitions (M&A) networks. Our study uncovers the effects of air pollution on mergers and acquisitions (M&As) by analyzing 13,000 M&A transactions across 284 prefecture-level and above cities in China from 2004 to 2018. To address the endogeneity issue, we construct an M&A model for urban networks under air pollution using an instrument variable of temperature inversion, combined with the Two-Stage Least Squares (2SLS) method and Social Network Analysis (SNA). Our findings reveal a significant negative relationship between air pollution levels and both in-degree and out-degree centrality, with a more pronounced effect on the latter. Such asymmetry highlights the differentiated roles of environmental constraints in shaping the behaviors of acquirers versus targets. This article advances our understanding of implicit environmental values in corporate decision-making, contributing to the juxtaposition of environmental and financial research. Practically, our findings call for enhancing the coordination between environmental planning polices and financial regulations.



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C24.11-Gender and Geography: Care, Connection and Change => Decolonial Thinking in Feminist Geographies



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1614 - Contributions Of Decolonial Feminist Geography To The Spatial Analysis Of Human Trafficking For Sexual Exploitation.

Magdalena Moreno¹

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Human trafficking for sexual exploitation is one of the most extreme forms of gender-based violence and involves, to varying degrees, the vast majority of countries in the world. This paper reflects on the need to incorporate decolonial thinking into feminist geography in order to understand the particularities of human trafficking for sexual exploitation in a South American country.

It begins by presenting the theoretical foundations that argue for the essential role of decolonial feminist geography in highlighting the particular characteristics of human trafficking in a given territory and in showing that the spaces of human trafficking on a global scale are constituted by the coexistence of different characteristics of the phenomenon in each country.

Next, the main results obtained in the doctoral research carried out on the spatial configuration of human trafficking for sexual exploitation in Argentina are presented, after implementing a qualitative methodology focused on documentary analysis and interviews with key informants from political and civil society. Finally, to open the debate, examples are presented that demonstrate that importing public policies from core countries where trafficking takes on other spatial characteristics does not achieve the objective of ending the crime but rather reproduces colonialist gender logic. For example, human trafficking is often linked to the phenomenon of migration and the restrictive policies of core countries. However, in Argentina, trafficking is not related to this issue; instead, it is the precarious living conditions of sexually trafficked persons that make the phenomenon possible. Therefore, there is a clear need to adopt a geographical, feminist, and decolonial perspective that enables us to understand that the focus of public policies against trafficking in Argentina should be on improving the socio-economic conditions of the population, rather than on migration issues.



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1829 - The Racialized Landscape Of Cartagena A Colonial Discharge Of Urban Territorial Justice **Ivaldo Lima ¹**

Fluminense Federal University, Geography, Rio De Janeiro-Brazil ¹

So marked by the colonial heritage, Latin America calls upon us to combat the moral economy of privilege. It is a combative ethical and political attitude that we must adopt: to discharge this colonial weight. Beyond the academic sphere defending decoloniality, this struggle is occurring at the ground level, in the configuration of the urban landscape, in short, in the spatial practices and tactics of those who live daily, face to face, in the city. Certainly, in Latin American territory, the moral economy of privilege is still ensured by the white elite to the detriment of Indigenous, and Black people. Therefore, feminist counter-geographies emerge that delegitimize and deconstruct this unequal and unjust moral economy fueled by the pact of whiteness. Here, the concept of territorial justice is addressed from the epistemic perspective of the decolonial turn, recognizing the structural marks of the modern-colonial wound in the social production of urban space. Our objective is to confront the modern-colonial, patriarchal, and racist capitalist matrix. Taking the urban landscape, we selected the public art of graffiti to elucidate the decolonial critique contained in the affirmation of blackness – black identity. Therefore, the graffiti of the city of Cartagena de Índias, on the Caribbean coast of Colombia, become the empirical object of analysis from a black feminist geography perspective. For this reason, we suggest poetically inhabiting the urban visual landscape through the reading of the faces that are configured within it. Faces in the landscape and faces as landscape. All of this is part of the colonial discharge. Which faces? What do they express? What discourses do they utter? What does the face of/in the city ultimately mean? In the case of the city of Cartagena, the multifaceted, multicolored, and above all, polysemic landscape, marked by feminist protest, is striking. We highlight the presence of predominantly Black women's faces as an affirmation of racial identity and note that this presence refers to the construction of a racialized landscape. We conclude that race and racialization are present in the social construction of the circumstances of that landscape.



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2180 - Bringing Law To The Neighbourhood Re Creation Of Pluri Legal Spaces By Mahila Panchayats In Delhi.

Swagata Basu¹

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This paper draws from Daigle and Ramirez (2019) who visualize the creation of decolonial spaces through connecting indigenous geographies in the context of legal spaces. Tamanaha (2011) reflects on a post-colonial nation where the colonial law supplants itself over the local, customary laws. This process fits well into the history of India's modern law making process in general and the case of laws on Domestic Violence in particular where as Kannabiran (2014) emphasizes the all-pervading ability of the law to touch lives, but the impact of the law is dependent on how the law imagines women especially in places in the Global South where most women rights workers and lawyers are post-colonial bourgeois, and is difficult for women from lower echelons of society to relate to them. (Manji, 1999). Within this context, the Mahila Panchayats (women's courts) create quasi-legal spaces within low income neighbourhoods in Delhi where para legal workers deploy a variety of customary practices as well as legal provisions to mitigate incidences of domestic violence. Documenting these pluri-legal feminist spaces entails epistemological ambition considering pluri-versality as against universality of knowledge (Kumar, 2026), developing methods that centre marginalised voices, claiming histories, story-telling, celebrating surviving, reactivating memories of earlier feminist struggles (Smith, 1999) across similar spaces with shared histories, politics (Verges, 2021) and where co-creation of knowledge occurs through active engagement of 'thought and action based on decolonial and feminist principles'.



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2251 - Gendered Care Across Borders Digital Connections And Everyday Geographies Of Social Welfare

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The everyday use of digital platforms by migrant mothers has increasingly attracted attention in studies on care, migration and digital intimacies. Yet, less is known about how these spaces operate as gendered and decolonial political infrastructures of everyday life, particularly in relation to territory, climate, health and unequal access to welfare. This article addresses this gap by analysing how WhatsApp groups formed by migrant mothers function as informal infrastructures of care, connection and collective regulation in transnational contexts between Brazil and Portugal. Drawing on a qualitative digital ethnography, the study analyses a corpus of everyday interactions exchanged within a WhatsApp group composed primarily of migrant mothers residing in Portugal, with ongoing connections to Brazil. The analysis focuses on routine discussions concerning infant feeding, climate adaptation, respiratory health, domestic materialities, urban navigation and risk management. Rather than exceptional moments of crisis, the data foreground ordinary practices through which care is continuously negotiated, learned and sustained. The findings reveal that the group operates as a maternal counterpublic in which technical knowledge is reworked through lived experience and shared vulnerability. Care practices are collectively validated without moral judgement, producing situated territorial knowledge that enables migrant mothers to navigate cities, housing conditions and environmental challenges while compensating for limited institutional support. These exchanges also function as forms of ethical regulation, particularly in relation to health risks and domestic technologies, transforming individual experiences into shared standards of precaution and responsibility. The paper argues that these digital practices constitute a form of everyday feminist geopolitics, through which gendered relations of power, inequality and belonging are negotiated in seemingly private spaces. By conceptualising WhatsApp as an extension of the home and a political space of care, the study contributes to feminist and decolonial geography by foregrounding how migrant women from the Global South produce knowledge, connection and change beyond Eurocentric models of welfare, expertise and integration.



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C24.11-Gender and Geography: Care, Connection and Change => Gender and Sexuality



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1111 - From Dissonance To Resonance Rhythmic Transformations In The Recovery Narratives Of Women Living With Alcohol Addiction

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Background/Hypothesis:

This study examines how women living with alcohol addiction transform everyday rhythms as they navigate misogyny, stigma, and the pressures of capitalist patriarchy. Drawing on feminist geography, the research asks how recovery emerges through the re-organization of embodied and relational rhythms, and how these processes differ from those documented in studies of chronic illness (e.g., Moss & Dyck 2002).

Materials and Methods:

The analysis draws on life-history interviews with eight women in Japan who participate in self-help groups such as Alcoholics Anonymous (AA). A rhythm analytical and feminist geographic approach was used to examine experiences of excessive synchronization in intimate relationships, the acceleration of drinking rhythms, and the role of these groups as gendered recovery spaces.

Results:

Participants described being compelled into forms of excessive synchronization within intimate relationships, which generated exhaustion, frustration, and emotional pain. Drinking temporarily eased these burdens but accelerated bodily wear and social isolation as its rhythm intensified. In AA—spaces often shaped by masculine norms and narrative rhythms—women nonetheless cultivated their recovery through solidarities grounded in recognizing difference as a generative force. These interactions generated rhythms of resonance that enabled women to prioritize attending meetings over caring for others, to articulate their emotions, and to reconfigure their sense of self through collective presence.

Conclusions:

Recovery from addiction was grounded in relational, collective rhythms, contrasting with more body-contingent rhythms described in chronic illness research. While chronic illness management often involves adjusting one's environment and daily routines in response to bodily variability, recovery from addiction emerged through shared rhythms cultivated with others in AA meetings. This study contributes to feminist geography by re-theorizing recovery as a rhythmic, gendered, and relational process shaped by everyday power relations.



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2215 - Atlas Based Gi Science Methods For Gender And Sexuality Data Lessons From Integrating 400+ Disaggregated Indicators In India

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ATLAS-BASED GI SCIENCE METHODS FOR GENDER AND SEXUALITY DATA: LESSONS FROM INTEGRATING 400+ DISAGGREGATED INDICATORS IN INDIA

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‘Sexuality’ and ‘gender’ are not confusing because of their qualitative nature, but they become confused when qualitative understanding is missing from quantitative design. We need to recognize that disaggregated data and narratives are not competing tools; they are interdependent. Without narratives, data misclassifies and remains invisible to policy. The construction of large-scale gender atlases presents a technically demanding test case for GIScience methods, particularly when integrating heterogeneous, gender-disaggregated datasets across space and time. Binary classifications restricts representation of sexuality and gender within these systems. Further, conceptual conflation and other qualitative limitations are embedded in spatial data infrastructures (SDIs). This paper reports learnings from data input, methodological insights, and geanalytics from developing four Gender Atlases of India (Parihar, 2015, 2016, 2022, 2025), incorporating more than 400 gender-disaggregated indicators from different censuses, Government of India portals, administrative records, and national surveys. Focusing on data collection across 10 themes and on preprocessing rather than outcomes alone, the study systematically analyzes challenges related to indicator harmonization, schema inconsistencies, spatial and temporal misalignments, classification rigidity, and the near-absence of sexuality-specific variables. Using a GIScience framework, the paper evaluates how these challenges propagate through spatial aggregation, choropleth mapping, and composite index construction, with particular attention to scale effects, the modifiable areal unit problem (MAUP), and uncertainty masking. To address these issues, the study proposes methodologically explicit solutions, including indicator ontology design, SDI-compliant yet extensible attribute schemas, scale-sensitive spatial normalization, and uncertainty-aware visual encoding strategies. The paper further demonstrates how iterative atlas production functions as a methodological laboratory, revealing the interaction between data architecture and visual analytics. By foregrounding data integration workflows and formal spatial methods, this study contributes reproducible GIScience approaches for handling complex gender and sexuality data in atlas-based visualization and spatial decision-support systems.



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C24.11-Gender and Geography: Care, Connection and Change => Mapping Gendered and Embodied Geographies of Migration: Art Based, Creative and Participatory Approaches



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1589 - The Art Of Subaltern Presence – Mapping Practices Of Urban Border Contestation

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This contribution analyses the emotional topography of urban border regimes through a co-creative research design that combines participatory, arts-based methods with ethnographic border regime analysis. Drawing on counter-mapping approaches, the work employs artistic forms of spatial analysis – including painting, creative writing, and photography – to engage with embodied experiences of borders in everyday urban life of migrant subjects.

Grounded in a critical feminist research perspective, the contribution demonstrates how normative border orders are inscribed into bodies and urban spaces, shaping power relations beyond territorial or legal demarcations. By focusing on everyday practices of subaltern contestation, the contribution conceptualizes affective acts of citizenship as quotidian practices through which migrant subjects reclaim their bodies and generate alternative relations of belonging and participation within the city.

Empirically, the analysis is based on a collaborative research workshop conducted in Hamburg (Germany) together with (illegalized) migrants and local artists. The contribution shows how artistic creation not only facilitates an understanding of subjective experiences of space and spatial production but also challenges dominant politics of visibility. At the same time, these practices generate alternative spatialities that foster new emotional connections to places and bodies. Through their artistic engagements, the co-researchers made visible an alternative gaze on the city and formed an emotional community that collectively challenges established orders of citizenship. In this sense, the artistic research practice developed here functioned as a fruitful approach to power-critical knowledge production, but as an empowerment practice that contributes to the production of alternative spaces of political belonging and participation.



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1613 - Scrolling As Habit Using Digital And Sensory Methods With Sri Lankan Refugees In Australia **Charishma Ratnam¹**

Royal Melbourne Institute Of Technology, Social Equity Research Centre, Melbourne-Australia ¹

Scrolling on digital devices is a tactile and embodied practice that has become indispensable in everyday life. Touching a screen to move through content is both a cognitive process of sense-making and a sensory, emotional experience. Emotions and memories may surface unexpectedly or deliberately via scrolling, which is particularly significant for refugees who document, curate, and share experiences on digital platforms. In this paper, I discuss methodological insights from a project that has examined how Sri Lankan refugees use smartphones during resettlement. I employed a digital scroll-through method in which participants shared and navigated the different digital platforms they used, illuminating their digital practices. Participants' digital practices comprised everyday uses of digital technologies, their purposes, and the social and cultural dimensions of refugees' lives that became digitally mediated. The method revealed social, cultural, and everyday practices, and how such practices have become embedded in uses of digital technologies. However, a key aspect of the method was the cognitive, embodied, and social practice of scrolling. Scrolling through digital devices with participants involved navigating memories and personal histories that formed part of their digital practices and digital traces. But it was also a simple habit that occupied, distracted, and entertained participants. In this paper, I seek to unpack the multiple dimensions of scrolling—a habit, a prompt, and a motion—that can offer deeper understandings of refugees' emotions and lives (past, present, and future).



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1657 - Sexual And Gender Dissidence In Urban To Rural Movements Being And Belonging In Rural Spain

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Background / Hypothesis

Rural Catalonia, like many rural areas in Europe, is experiencing important social, cultural and economic transformations. However, discussions on rural change tend to focus on demographic or economic issues, leaving little attention to more radical forms of citizenship to emerge. This study examines young LBT women who establish themselves in contemporary rural contexts, with the aim of analyzing how sexual and gender dissidence shapes both their motivations for moving to rural areas and their processes of settling and belonging.

Materials and Methods

This study uses a qualitative and intersectional approach based on in-depth interviews with LBT youth aged 25–34 who moved from cities to different rural areas across Catalonia. The analysis focuses on social relationships, practices of care, and place-making strategies. These elements help to understand how participants manage visibility, build meaningful connections, and develop a sense of belonging in rural settings.

Results

The findings show that rural life intersects with gender and sexuality, together with other social and structural conditions. This intersection creates specific vulnerabilities, including limited access to housing, the absence of supportive networks, and everyday heteronormative pressures. In response, participants develop a range of strategies based on care, social connections, and creative place-making. These strategies include informal support networks, local activism, temporary mobility, and the reconfiguration of rural spaces through everyday practices.

Conclusions

Sexual and gender dissidence does not primarily explain the decision to move to rural areas, but it strongly shapes the conditions of staying and settling among LBT youth. Experiences of dissidence influence everyday negotiations of visibility, support, and belonging, which are key to long-term rural permanence. Through practices of care and place-making, LBT youth actively contribute to sustaining rural social life, highlighting the need for gender- and sexuality-inclusive approaches to rural planning and social sustainability.



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1707 - Filming Resistance Embodied Research With Displaced Women In Colombia's Borderlands

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In Colombia's north-western Catatumbo region, bordering Venezuela, illegal armed groups—including the FARC, ELN, EPL, and right-wing paramilitaries—have waged a brutal struggle for territorial control for over two decades, as the area is a major centre of cocaine production. This violence has displaced large rural populations, with women disproportionately affected. Beyond forced displacement, sexual violence—particularly gang rape—has been systematically used as a weapon of war to terrorise civilians. Based on over three years of research with displaced migrant women, this project emerged from a commitment to socially engaged research that promotes empowerment and shares representational power with participants. Using embodiment as a qualitative research tool (Vacchelli, 2018), and drawing on feminist and postcolonial theory, I co-produced the documentary *Weaving Threads Across Borders* with three displaced Colombian women, enabling them to represent their own lived realities. The project also employed mental mapping and Minga workshops as spaces for collective learning and healing (Riaño, 2016). Structured in three chapters, the film reveals how armed conflict and state violence intersect with women's resistance, resilience, and peace-building efforts. This presentation examines documentary filmmaking as an embodied research method that enables knowledge co-production, women's empowerment, the disruption of victimising narratives, and the visibility of less-recognised forms of women's resistance.



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1745 - Young People's Everyday Life Experiences And Expectations In A Rural Context

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The autonomous region of Catalonia (Spain) is used as an example to approach the everyday life, experiences and expectations of young people living in rural areas. Recent investments in infrastructures and the extension of basic services in rural areas have improved quality of life but have not always contributed to stabilizing the rural population. Migration from rural to urban areas is present in future and gendered expectations of young people.

We intend to know the daily experience of teenagers who currently live in rural areas and how they perceive their future in this territory. To know the interpretation of rurality by adolescents, since they are in a stage of transition to adulthood in which they must make decisions on relevant aspects that can condition their adult life.

We analyze their real needs and their opinions about their future and that of their territories. The research is carried out in rural areas of Catalonia with population densities between 25 and 50 inhabitants / km². The analysis is developed from a gender and intersectional perspective and based on qualitative research methodologies.

In collaboration with local secondary schools, we have identified 4 groups of teenagers (14-16 years old) living in different rural areas in Catalonia. We have organized focus groups to capture their everyday life experience of rurality, individually and collectively. We have been looking at their mobilities, experiences, plans or ideas about staying or moving to study or to work in the future. We look also at their agency and social activity in the place where they live as key factors.



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1803 - Crossing Lines And Drawing Connections The Autoethnographic Experiment Of Artlitgeo.com

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Johannes Gutenberg University Mainz, Human Geography, Mainz-Germany¹

Background/hypothesis:

Artlitgeo .com is a project that deals with the anxieties of doing academia as artists, a project that sheds the burden of conformity and reflects on the production of difference from personal experiences. Our academic, multimedia, visual storytelling project is personal and alive, and, importantly, co-created from our shared positionalities across borders. As new migrants in Germany– Eva, a queer American woman & Nina, a non-binary Russian Korean – we amplify the radical influence of our art and counteract the identities imposed on us by stereotypes and prejudice. We ground ourselves by turning to humanist geography and the theoretical frameworks of scholars like bell hooks, Saidiya Hartman, Michel Foucault and Joseph Beuys. In addition, we artistically handbound the contents into a short book, *Liminality of Difference*, wherein we talk about our own ways of doing academia: subversive, creative and interconnected.

Materials and methods:

In the format of an experimental academic presentation, we will both tell our stories by introducing our experience working on this project and facilitate a short book-binding demo, wherein we show strong reflexivity put into practice in the spatiality of identity and radical subjectivity as a means of knowledge production. This embodied autoethnographic way of researching art, literature, and geography describes our approach to academia, which is rooted in our diverse cultural experiences. We are eager to share these thoughts because we believe in human creativity's power to deepen understandings of the migrant experience.

Results:

Our website is not yet publicly accessible, but please feel free to explore the site, artlitgeo.com, using the password N1na&3va4EVA. We are also happy, upon request, to share our hand-bound books.



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2020 - Community Based Participatory Research With Roma Communities Ethics Power Sharing And Equitable Decision Making

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Community Renewal Trust, N/a, Glasgow-United Kingdom⁵

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Luton Roma Trust, N/a, Luton-United Kingdom⁷

Roma Support Group, N/a, London-United Kingdom⁸

Background

Community-based participatory research (CBPR) seeks to democratise knowledge production and address power imbalances in research with marginalised communities. However, implementing CBPR with highly marginalised groups such as Roma communities raises critical questions around trust-building, reciprocity and genuine power-sharing. This paper examines the co-researcher model developed in the PlaceAge project, exploring how training Roma community researchers transforms research relationships and knowledge production whilst confronting ethical and practical challenges.

Materials and Methods

The PlaceAge project (2024-27) trained 26 Roma community researchers across three UK sites (Glasgow, Peterborough, and Luton). Training encompassed: research ethics; semi-structured and go-along interviews; and visual, mobile and participatory mapping methods. Co-researchers were involved across all stages, from research design through data collection and interpretation, supported by ongoing reflexive dialogue around power dynamics, representation and cultural values throughout the research process.

Results

The co-researcher model demonstrated transformative benefits. Co-researchers' cultural knowledge and community trust enabled deeper insights into Roma experiences of place and ageing, producing richer data. Training supported skills development, confidence and strengthened representation and voice, positioning capacity-building as reciprocity. However, realising participatory ideals also raised challenges: trust-building required extended timeframes that conflicted with academic funding cycles; power-sharing involved negotiating institutional ethics with community priorities around privacy, representation and collective decision-making; and navigating dual positionality as both researcher and Roma community member created complex boundary negotiations between professional distance and lived experience.

Conclusions

CBPR with Roma communities offers transformative potential for enhancing research quality, community empowerment and reflexive practice when designed with sustained commitment from all partners.

Participatory research emerges as an ongoing negotiation, where reciprocity extends beyond payment to meaningful skills development and community benefit, while demanding critical attention to power asymmetries, cultural values and the emotional labour of insider research.



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2397 - A Subaltern Travelogue Ontological Experiments In Wanderings Along The Hindustan Tibet Road

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Iiser Mohali, Humanities And Social Sciences, Sas Nagar-India ¹

In this paper, I draw on my long-term research project Road Chronicles to examine the gendered and embodied geographies of seasonal migration among road construction labourers in India. The project is concerned with the palpable and obscured processes surrounding road construction activity, and with the labouring subaltern bodies—geological and human—that animate a road. Rather than treating migration as linear movement between fixed origins and destinations, I focus on movement along the road as a lived and relational process, produced through bodily labour, care, waiting, exhaustion, and everyday social relations. These experiences come together in what I conceptualise as subaltern travelogues: fragmented, collaborative, and embodied accounts of mobility that challenge elite traditions of travel writing and dominant representations of migration.

This project draws on geographically stretched ethnographic fieldwork conducted since 2011 along the Indo-Tibetan border road and the Manali–Leh highway, and in the winter return journeys of migrant labourers to Dumka district in Jharkhand. Research unfolds through walking, listening, writing, making, and sustained co-presence on and alongside the road construction labourers.

By ontological experiments, I refer to methodological and representational practices that do not simply document migration, but reconfigure what is understood to exist in studies of infrastructure and mobility. The presentation will use reflexive practices on previous art-based outcomes of this research and conceptualize other ways to produce the subaltern travelogue.



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2423 - Exploring Collaborative Cooking As A Creative And Therapeutic Method With Refugee And Migrant Communities

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Cooking is an underutilised creative methodology in migration studies research. Despite its increasing profile as a community engagement tool, in studies about diasporic recreations of 'home' through food and interest in emotional and corporeal geographies, cooking has not been explored to its full potential as a means of generating disparate knowledges that forefront migrant voices. This paper explores the duality of cooking as both creative method and a potential therapeutic initiative. It draws upon participatory cooking activities as a mechanism for eliciting narratives around food and wellbeing with migrant communities, reflecting on the process of cooking as a departure from other facilitated arts-based methods. The act of cooking facilitates communication for the participants through sensemaking of their interior world. The mindful act of cooking and process of creative expression through food is therefore a means of producing embodied cognition with potential therapeutic benefits, while eating communally with others can be bridging - in the sharing of food that represents homes and cultures - by encouraging mutual understanding and creating connection. The paper will also explore how the embodied process of cooking has the potential to unsettle power dynamics in participatory research. As a means of creating space for other knowledges, cooking as a creative practice can empower participants as holders of cultural knowledge and help minimise the gap between research and the researched.



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2495 - Storytelling European Parliamentary Heritage Collections In Diverse And Changing Societies

Saskia Warren¹

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Background

This paper analyses how multiple publics perform an engagement with parliamentary heritage collections across different European countries. State authority and national symbolism are produced by state actors and intermediaries over time, and also challenged and unsettled.

Contestation takes place internally and externally to the legal ‘container’ of the nation-state in postcolonial and settler colonial contexts, including by creative contributions of migrants and ethnic minorities who operate within and outside of bordered imaginaries. Insights are informed by interdisciplinary postmigration theory (Ring Petersen and Schramm 2017; Dahinden 2016; Wimmer and Glick-Schiller 2003), in particular art historian Marsha Meskimmon’s (2017) writing on postmigration, feminist materialism and decolonial praxis for reading ‘against the grain’ of the nation and citizenship.

Methods

Empirical insights are produced from a Parliamentary Academic Fellowship, Heritage Collections, UK Parliament (ESRC; 2021-23) and follow-on grant supporting cross-national study in Ireland, Norway and Belgium. Data collection comprises semi-structured interviews, focus groups, walking tours and a creative workshop to bring together multiple perspectives and sensorial responses.

Results

Heritage is used to tell stories of the nation and nationhood to parliamentary visitors including through the delivery of tours for new arrivals and asylum seekers. Expert ethnic and religious minority participants uncovered complex readings of heritage and art in the postcolonial space of UK Parliament in a discussion of power, religion and solidarities. But curatorial blind-spots continue to exist in multiple parliaments (e.g. Belgium, Ireland) in the representation and engagement of ethnic and racial minority groups.

Conclusions

Empirical research and analyses of European parliamentary art collections reveal how cultural objects are enrolled in storytelling of the nation-state. In different ways, however, the collections exceed an abstract bounded imaginary of the state, giving emphasis to migrations and cultural exchange. Using qualitative, creative and participatory methods this paper advances the voice and agency of ethnic minority and migrant groups for recontouring nationhood and belonging.



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C24.11-Gender and Geography: Care, Connection and Change => The Situation of Afghan Women Under the Resurgence of the Taliban Patriarchy



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1313 - From Strange To Sacred Analysing The Placemaking Practices Of Afghan Women Artivists **Prateeksha Pathak¹**

York University, Geography, Toronto-Canada ¹

The persistent question “where are you from?” puzzles displaced populations, who are often forced to leave their homes due to economic, ecological, and geopolitical upheavals, thereby complicating their sense of belonging (Chawla, 2014). Afghans, compelled to flee their homes in the late twentieth century and again after the 2021 Taliban resurgence following U.S. withdrawal, exemplify one of the world’s most profoundly uprooted groups. This enforced mobility complicates the unidimensional and sedentarist conception of home, particularly for Afghan women navigating gendered and geopolitical constraints. Instead, home becomes an active process to render the strange familiar and forge belonging (Wood & Young, 2016). Drawing on feminist geographies of place and affect, this paper explores how Afghan women artists produce home as a dynamic assemblage of art, memory, and spatial practice. Artists use visual creations to challenge popular conceptions, share counter-narratives, perform activism and to materialise their ideas, thoughts and identity.

Through a digital ethnographic study, I analyse how Afghan women artists in Afghanistan and in the diaspora perceive and produce home through their art. I focus on the symbols, motifs, colours and design choices adopted by artists to represent their unique understanding of home. I also document the quotidian home-making practices adopted by Afghan women artists to invest spaces with significance and meaning and assert their belongingness in an unfamiliar territory. Diasporic works often evoke nostalgic longing for an irretrievable past, transforming canvases and installations into portals of reconnection, while those inside Afghanistan recast confined domestic spaces as sites of subtle resistance against carceral realities. These complex and diverse understandings of home complicate sedentarist paradigms that privilege rootedness and territoriality, particularly within scholarship and policy-making. By foregrounding artists’ embodied, creative labours, the paper reimagines home as a multi-scalar, agentic concept, emphasising memory, everyday remembrance rituals, and activism in complicating and materializing diverse meanings of home.



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2470 - Women's Place At The Resurgence Of The Taliban Patriarchy

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In August 2021 the Taliban seized power and constituted the Islamic Emirate of Afghanistan. In the following months and years the Emirate has passed edicts and orders to restrict women's fundamental rights. The objective of this research is to build knowledge of how the Taliban patriarchal social and spatial order, restored after August 2021, determines the situation of Afghan women. We aim to generate understandings of how, at the core of the resurgence of the Taliban patriarchy, the heterodesignations (Amorós, 2008) for women and their place are articulated.

We examined the edicts imposed by the Taliban and, specifically, we focus on the restrictions of women's use of public spaces. To contextualize these restrictions within the current living conditions of women in Afghanistan, we have collected data to describe and to generate an understanding of their general situation.

It is forbidden to study at secondary schools or at universities for women and girls. Public employment and participation in official politics have been forbidden for women. Women's voices cannot be heard in public spaces. Using public baths, gyms or parks have also been restricted for female inhabitants. For women who need to travel or even commute to their job facilities, it is mandatory to be accompanied by a male. Women's bodies in public spaces have to be completely covered.

The indicators of women's life conditions in Afghanistan show the advancement of the feminization of poverty, the worsening of their mental health or women's very low literacy rate (women 22.6%, men 52.1%, according to UNESCO, 2022). Afghanistan is the fifth country in the world with the highest gender inequality index (United Nations, 2025). 52% of Afghan women have suffered gender-based violence (Khatir et al., 2025).



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C24.12-Geographical Education => Geographic Education in a Plural World: Advancing Diversity and Inclusion



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1022 - Greek Cypriot Primary And Secondary Geography Teachers' Perspectives On Diversity And Inclusion In School Practice

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This paper presents findings from a qualitative study conducted within the Erasmus+ project V-GeoSciEd (2024-1-FR01-KA220-HED-000248534), exploring how Greek-Cypriot primary and secondary geography teachers understand and implement principles of diversity and inclusion in their classrooms. Data were drawn from structured focus group discussions (interview content analysis) involving teachers from varied school contexts. The analysis reveals that both groups demonstrate awareness of diversity as a multidimensional concept encompassing linguistic, cultural, socioeconomic, and learning ability-based differences. However, primary teachers tend to express a more concrete and empathetic understanding of diversity—emphasising individual student needs and everyday classroom adaptations—while secondary teachers conceptualise inclusion in more abstract terms, linking it to social justice and differentiation principles. Across both educational levels, cooperative learning, group work, and digital tools emerge as common inclusive practices, though their application remains inconsistent. Teachers highlight persistent structural barriers such as limited time, large class sizes, and insufficient training, which constrain the implementation of inclusive pedagogy. While professional reflection is evident, it often centers on external limitations rather than transformative change. Engagement with families and communities remains limited, representing an area of untapped potential. The study underscores a shared commitment to inclusive values but divergent modes of enactment: primary teachers translate inclusion into daily, responsive practice, whereas secondary geography teachers approach it as a professional goal hindered by systemic constraints. Findings point to the need for ongoing professional development, institutional support, and stronger school–community collaboration to bridge the gap between awareness and practice in inclusive geography education.



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1338 - Decolonising Geography Education Through Teacher Training Analytical Criteria And Didactical Tools For Addressing Diversity And Inclusion In French Secondary School Curricula

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Background / Hypothesis

Diversity and inclusion are now central objectives of geography education policies in many countries. However, inclusive intentions do not necessarily imply a decolonisation of the knowledge conveyed through school curricula. This oral presentation is based on the hypothesis that geography curricula may remain shaped by colonial forms of knowledge even when they promote openness to diversity. In such cases, inclusion may be reduced to a diversification of examples rather than a critical engagement with epistemic hierarchies, representations of space and actors' agency.

Materials and Methods

The presentation draws on an analysis of French secondary school geography curricula and selected textbooks, informed by a systematic review of international literature on decolonisation in geography education. To examine the coloniality of curricular content, three analytical criteria are proposed for use in teacher education : (1) recognition of actors' agency through diverse practices, representations and situated knowledges ; (2) reflexive engagement with geographical concepts as historically and culturally situated categories ; and (3) curricular mechanisms of comparison and classification that may reinforce or challenge hierarchical representations of space.

Results

Applying these criteria to the French case reveals persistent forms of curricular injustice, particularly through developmentalist narratives, comparative frameworks that naturalise spatial hierarchies, and limited opportunities for students to critically engage with key geographical concepts. In response, the presentation outlines concrete didactical tools for teacher education and classroom practice, including decolonial analytical routines and critical tools for reflexive geographical inquiry.

Conclusions

The presentation argues that decolonising geography education requires more than inclusive discourse. It calls for explicit analytical and pedagogical tools that support teachers in developing powerful, inclusive and critically informed geographical knowledge through initial and in-service training.



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1429 - The Importance And Challenges Of Inclusive Geography Learning In Japan Classroom Practices Using Braille And Large Print Textbooks For Students With Visual Impairments

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This study explores the importance and challenges of inclusive geography learning by examining classroom practices that enable students with visual impairments to engage in meaningful learning through the use of braille and large-print textbooks. In special needs education, it is essential for students with visual impairments to obtain, express, and process information within a well-prepared learning environment. In Japan, braille and large-print textbooks are carefully designed to ensure accessibility and comprehensibility for students with visual impairments.

The classroom practices examined in this study were designed for lower secondary school students with visual impairments. In Japan, the lower secondary geography curriculum is based on regional geography, covering regions of Japan as well as countries around the world. The development of geographical skills constitutes the foundation of geography learning. Accordingly, classroom practices emphasized the interpretation of maps, charts, and data as basic geographical skills. Students engaged deeply with a limited set of learning materials to understand regional characteristics and issues. However, significant challenges were identified, including the extensive time required to interpret visual data and the resulting difficulty in allocating sufficient instructional time for higher-order thinking activities, such as analysis, evaluation, and problem-solving.

As learning environments in which students with and without disabilities study together are expected to expand further in Japan, it is crucial to provide appropriate pedagogical accommodations that acknowledge the additional time and support required for reading and interpreting visual materials. Fostering basic geographical skills is integral to inclusive geography learning. Moreover, students with disabilities may benefit from collaborative learning with students without disabilities, as peer support can facilitate the development of these skills into more advanced higher-order thinking activities.



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1469 - Implementing Diversity In Teacher Training In Geography Education

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Geography education shows limited attention to the diversity of content and of the actors represented. Certain groups are not given the opportunity to demonstrate their abilities, whereas others are overrepresented and stereotyped. The latter category largely comprises white, middle aged men. This paper therefore examines how geography might be taught differently. Within the Erasmus Plus V GeoSciEd project, a training model has been developed to equip educators with tools to integrate diversity into their pedagogical practices. This model combines the TPACK model (Mishra, & Koehle, 2006) and Universal Design for Learning (Hall et al., 2012) with subject specific knowledge. The model has been integrated into the Master's degree in Education at Paris Cité University for in service teachers engaged in continuing professional development. The study analyses the implementation of this model and explores the benefits and limitations of integrating diversity training into geography teacher education. The analysis draws on a qualitative approach (Creswell & Creswell, 2018) to oral and written work produced by trainee teachers, as well as to their interactions with trainers.

The findings suggest that the model affects the teacher education programme as a whole and cannot be reduced to a single session devoted to diversity. Trainee teachers need to become aware of the lack of diversity in the curriculum and to develop their knowledge of epistemology and ICT in education. Diversity is thus presented as a potential catalyst for the development of trainee teachers' reflective skills. However, the emergence of new teaching practices is constrained by the difficulty of finding appropriate resources. In addition, it is not always easy to respond adequately to the sometimes very high level of diversity within student populations.

Creswell, J. W., & Creswell, J. D. (2018). *Research Design : Qualitative, Quantitative, and Mixed Methods Approaches* (5th edition). SAGE Publications, Inc.

Hall, T. E., Meyer, A., & Rose, D. H. (2012). *Universal Design for Learning in the Classroom : Practical Applications*. Guilford Press.

Mishra, P., & Koehle, M. J. (2006). Technological pedagogical content knowledge : A framework for teacher knowledge. *Teachers College Record*, Teachers College Record, 108(6), 1017-1054.



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1479 - Teaching Environmental Issues In Higher Education An

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In France, the introduction of a compulsory, cross-disciplinary course on environmental issues at the bachelor's level marks a major shift in higher education. This reform challenges the long-standing disciplinary culture that has traditionally shaped academic practices (Becher, 1994; Bridoux et al., 2023). As Barthes (2025, p. 3) suggests, such transformations could deeply affect the cultures and practices of higher education and research. However, the extent to which this change translates into pedagogical innovation remains uncertain. Results from the V-Global project—an exploratory survey conducted in eight European countries as part of the Erasmus Plus Program (2021-1-FR01-KA220-HED-000023242)—indicate that fewer than half of higher education teachers involved in teaching environmental issues explicitly integrate learning objectives linked to education for sustainable development (ESD), such as sustainability-related values, attitudes, and competencies (Leininger-Frézal et al., 2023). This finding raises the question of the effective consideration of the political dimension of environmental issues in higher education. How do academics address this dimension in the curriculum?

To address this question, approximately thirty semi-structured interviews were conducted between 2024 and 2025 with academics. Each interview was analyzed through thematic content analysis following Creswell (2018). Findings show that most university teachers do not view environmental issues as wicked problems (Fabre, 2022). Instead, they commonly present behavioral, collective, or individual solutions as ways for students to manage their sense of powerlessness in the face of global challenges. Project-based and experiential pedagogies are frequently used to encourage students' direct contribution to problem-solving. Furthermore, the new curriculum often reinforces traditional disciplinary approaches. Nevertheless, this tendency might constrain the explicit integration of the political dimension of the socio-ecological transition.

Barthes, A. (2025). Les objectifs de développement durable : Un renouveau des cultures et pratiques de l'enseignement supérieur ? *Diversité*, 206. <https://hal.science/hal-05055356>

Becher, T. (1994). The significance of disciplinary differences. *Studies in Higher Education*, 19(2). <https://doi.org/10.1080/03075079412331382007>

Bridoux, S., Grenier-Boley, N., & Leininger-Frézal, C. (Eds.). (2023). *Research in University Pedagogy Towards a Discipline-based Approach?* ISTE-Wiley.

Leininger-Frézal, C. et al. (2023). Global Change Challenge in the Higher Education Curriculum on the approach of Blended Learning. *European Journal of Geography*, 14(2). <https://doi.org/10.48088/ejg.c.lei.14.2.001.014>



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1629 - Fostering Critical Skepticism Through Inquiry Based Learning Geography Education In A Plural World

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In a plural world characterized by generative artificial intelligence and competing geographical narratives, geography education faces the challenge of preparing students to navigate diverse and often conflicting sources of knowledge. While geography curricula have traditionally emphasized factual understanding, less attention has been paid to how inquiry-based learning can cultivate students' critical skepticism toward information, particularly in AI-mediated learning environments.

This study presents findings from a mixed-methods investigation involving 124 Grade 11 students in Taiwan who participated in a semester-long geography inquiry project. Students engaged with interactive digital platforms, including generative AI tools (ChatGPT and Gemini) and location-based game (LBG) environments, to investigate real-world geographical issues. A competency-based assessment evaluated students' inquiry skills, complemented by qualitative reflections on their learning experiences.

Quantitative results indicated a distinctive cognitive gap: while students demonstrated high proficiency in Interpreting Data (graphicacy skills), they exhibited a marked deficit in Evaluating Scientific Inquiry, revealing underlying difficulties with identifying research bias and methodological limitations. Qualitative analysis further showed that direct engagement with multiple AI tools prompted spontaneous epistemic skepticism. Students reported that encountering AI hallucinations and contradictory outputs across different models compelled them to cross-check sources and question information credibility. As one student reflected, "After seeing ChatGPT and Gemini give different answers to the same question, I started verifying information from multiple sources."

These findings suggest that inquiry-based learning supported by AI tools can play a critical role in fostering scientific literacy and epistemic awareness in geography education. By enabling students to confront uncertainty and plurality in knowledge production firsthand, geography education can support more inclusive and critical forms of citizenship in an increasingly complex plural world.



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1833 - The Active Power Of School Geographic Knowledge Contributions Of Critical Political Geography

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In teacher training process, a recurring issue concerns the importance of geographical knowledge. Although Geography is considered a relevant science, some Geography undergraduates, future teachers, usually questions about the contents taught and not taught to school-age people. Would geographical knowledge be essential to citizen formation? Are the school contents commonly relevant to those children and young people lives? Why do many of the discussed topics in academic sphere isn't included in school curricula? In our studies we seek to find answers to those questions by reflecting on the role of geographical knowledge for socio-spatial reality transformation, considering the essential objectives of respecting diversity and inclusion. To this end, we seek in Critical Political Geography contributions to rethink the Geographic curricula, both in teacher training and in Brazilian schools. Preliminary researches points to the predominance of Classical Political Geography structures in teacher training and basic education curricula, as well as in didactic materials used in schools. Despite the renewal of the Geographic science since the 1980s in Brazil, the references of schools Geography still seems to present us with an apolitical Geography. Therefore, in order to consider geographical knowledge as a powerful knowledge, in the sense of overcoming the challenges of diversity and inclusion, we consider it essential to dialogue with the foundations of political geography, particularly with theories and concepts that allow us to move towards the incorporation of approaches from its critical strands. We justify this option, on the one hand, by recent attempts to institutionalize limits to research and teaching in the Human Sciences, approaching the discourse of neutrality that marked science and that profoundly influenced school Geography during an important period of our history. On the other hand, because we understand that in order to achieve the broader objectives of citizenship education, indicated as an essential goal in policies and programs aimed at Brazilian education, we need to follow a trajectory that dialogues directly with the foundations of politics and that considers knowledge as a resource of power.



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1966 - Teaching Digital Participatory Planning A Geographical Perspective

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Theoretical background

Public participation, digitalisation, sustainability, and geography together form a coherent educational, practical, and research framework. Public participation is central to the Sustainable Development Goals, recognising that individuals and communities have the right to influence decisions that shape their lives. In recent years, digital tools have increasingly mediated participatory processes, offering new modes of engagement. As a result, integrating digital approaches into participatory planning education has become both relevant and necessary. Geography – described as the ‘science of sustainability’ – provides an effective bridge in this integration. Its focus on spatial relationships, place-based contexts, and socio-environmental interdependencies helps connect the digital participation with broader sustainability goals and values.

First teaching experiences

The Erasmus+ project ‘Digital Education Modules for Participatory Planning’ (DEMo4PPL) has established a structured framework for teaching experiences in digital participatory planning. With the project completed in November 2025, it is now possible to reflect on the first outcomes of implementation. At the Faculty of Geographical Sciences, University of Lodz, pilot courses and workshops introduced students to digital participatory planning concepts using online mapping tools, collaborative platforms, and participatory methods applied to real planning challenges. These initial teaching experiences supported the integration of digital-based and participatory-based modules across various curricula, including spatial planning and tourism studies. The project also inspired geographical outreach and educational initiatives, such as MapoFaktura (GeoNight), demonstrating the potential of digital participatory planning beyond formal education. At the same time, the implementation revealed teaching and organisational challenges. These experiences provide valuable insights for the further development and scaling of the Modular Participatory Planning Curriculum (ModPPC) approach.

Long-term pedagogical implications

In the long term, DEMo4PPL demonstrates significant pedagogical value through its Multilingual Knowledge Hub and Toolkit, which provide flexible, open-access resources adaptable to diverse local conditions and institutional contexts. Their modular structure supports reuse and continuous updating, fostering digital competencies, participatory skills, and critical spatial thinking. Overall, DEMo4PPL promotes learner-centred, practice-oriented teaching approaches and offers a durable framework for embedding digital participatory planning education across disciplines.



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2297 - Social And Spatial Inclusion Of Children With Special Educational Needs In Japan

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Japan's birthrate is declining. However, the number of children receiving special needs education has increased steadily over the past 30 years. Consequently, ensuring children's right to grow up within a supportive community environment has become an urgent issue. The concept of "inclusive education" has attracted global attention, and diverse educational practices have been adopted across countries. This issue extends beyond school education alone and encompasses the social and spatial inclusion of children with developmental challenges. In the field of geography, several previous studies have been conducted on disabilities; however, research focusing on children with special educational needs remains limited, especially in the Japanese context. Therefore, this study examines special needs education in Japan and explores the possibilities for the social and spatial inclusion of children with special educational needs. Drawing on administrative materials and in-depth interviews with administrative officers, teachers, and parents, two main topics were examined: (i) the implementation of special needs education at the prefectural level and (ii) the process of school attendance, particularly the status of school entry consultations and actual school attendance. This study indicates that regional differences exist in the distribution of special needs education facilities, primarily due to variations in local government education policies. Furthermore, the existence of diverse educational settings, such as special needs schools and special support classes, suggests differing possibilities for the social and spatial inclusion of children depending on educational practices. The practices of "inclusive education" remain ambiguous and complex in the Japanese context, requiring the creation of further educational opportunities and supportive community environments tailored to the needs of each child.



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2334 - Tribe And Me Place Based Geographical Education For Urban Indigenous Youth In Taiwan

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In Taiwan, most Indigenous senior high school students must leave their home communities to attend schools in urban areas, where opportunities for indigenous cultural learning varies greatly. As a result, many urban indigenous youths grow up distant from their traditional territories, weakening intergenerational knowledge transmission and place attachment.

In response, this paper presents a curriculum developed specifically for an indigenous education programme in a senior high school in New Taipei City, Taiwan. The curriculum, titled “Tribe and Me”, integrates tribal community-based learning with inquiry-oriented geographical education to enhance students’ spatial thinking, inquiry skills, and connections to their home communities.

The complete curriculum consists of twelve learning units delivered over three semesters. Learning activities progress from the familiar to the distant (school campus → urban wetland → urban riverside tribe) and from the personal to the collective (self → family → tribe), enabling students to gradually build field observation, mapping, interviewing, and inquiry competencies. The main learning outcome is an individual project—such as a tribal booklet or fold-out map—documenting the geography, culture, and development issues of each student’s own tribe community.

Using classroom observations, analysis of student work, feedback surveys, and interviews, the study finds that students significantly improved their spatial thinking, environmental observation, and inquiry abilities. More importantly, students developed stronger emotional bonds with their tribal communities, increased motivation to return to their tribe community, and a renewed sense of cultural identity and confidence.

After the completion of the original project, school teachers have continued to adopt its core principles by guiding students to produce tribe-related booklet projects, demonstrating the curriculum’s long-term practical feasibility and educational value. A newly launched research initiative now focuses on examining how urban high school curricula can further strengthen indigenous identity and cultural subjectivity among indigenous students.

The results demonstrate that tribal community-based and inquiry-oriented geographical education offers a powerful model for culturally responsive, place-based learning in urban contexts and is readily transferable to mainstream geography classrooms.



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2693 - Minecraft For Education As A Tool For Innovation In Geography Teaching The Brazilian And Argentine Experiences

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Geographic space and its transformations constitute the core pedagogical themes in Geography education for Secondary School's students in Brazil and their counterparts in Argentina's. The Municipal Department of Education of São Paulo utilizes the "City Curriculum" (Currículo da Cidade), a guiding pedagogical document that adapts these contents to the metropolitan reality while prioritizing student agency throughout the learning process.

Within this framework, EMEF Marcos Mélega in São Paulo, has sought to innovate pedagogical methodologies through the CEUCI Project, developed since 2021 in partnership with Alert Informática and integrated into secondary School Geography classes.

Aiming to foster sustainability and social equity, the project engaged students in themes such as natural resource management and environmental racism, utilizing the game "Minecraft" as a supportive tool for studying the spatial transformations that shape geographic space. In 2022, the project was presented at the XIII Jornadas Cuyanas in Mendoza, Argentina, subsequently leading to its implementation at the Peres Cuesta School in that region.

This research aims to present the practical results achieved since 2021, featuring students who represented Brazil in an international competition hosted by UNESCO and Microsoft. These students developed a sustainable "world" within the game environment, demonstrating the practical potential of integrating technology into daily classroom activities. Furthermore, it analyzes the outcomes of the Argentine school's experience following the replication of the model established in São Paulo. In both instances, an interdisciplinary approach facilitated a dialogue between Geography and related fields, mediated by a gaming environment that aligns with student interests and habits. The findings indicate consistent and positive academic outcomes across both student groups.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Climate Change and Sustainability Issues: An Exposure–Sensitivity–Adaptive Capacity Approach for Achieving SDGs



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1049 - Social Vulnerability And Adaptation To Climate Change The Case Of Planned & Unplanned Population Relocations In The Bengal Delta India

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Population mobility is a complex phenomenon as it is 'multi-causal'. Climate change and environmental stress as a factor inducing population movement is accepted as a single most important strategy to reduce vulnerability and adaptation to climate change. The coastal areas are especially threatened by extreme events like coastal storms along with the relatively slow-onset disasters like sea level rise and the associated beach retreat, salinization and regular inundation. Many of the islands in the Bengal Delta (Sundarbans) are eroding fast inducing population mobility. This paper is based upon a comparative social vulnerability analysis of the communities who have been officially resettled by the West Bengal Government owing to the massive erosion of the Ghoramara Island in Sagar CD Block and those who have been experiencing coastal erosion induced displacement (economically displaced but spatially immobile) but have no access to State support. This study is based on household survey of 240 samples conducted in 2021 and uses the vulnerability framework in conversation with the livelihood framework to assess household level social vulnerability. The analysis brings out how the two institutionally divergent groups emerge nearly equally vulnerable in terms of the assets and capitals that they have access to and the kind of informal networks they access. It emerges that the State support has been inadequate to make the resettled population more resilient compared to the displaced group and calls for paradigm shift integrating disaster resilience building with the developmental initiatives with greater synergies between the State, the civil society and the non-governmental agents.



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1443 - An Urban Rural Divide In Community Resilience To Natural Hazards A Spatial Temporal Comparison Across Counties In The United States

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Background/hypothesis: Measuring community resilience to natural hazards remains challenging due to an overreliance on proxy indicators, insufficient validation with actual hazard outcomes, and limited attention to the weighting of predictors. Rural communities are hypothesized to have lower resilience compared with urban communities.

Materials and methods: This study applies the Resilience Inference Measurement (RIM) model — a novel framework previously validated in regional studies on coastal hazards, droughts, hurricanes, and earthquakes — to a national-scale analysis of 3,109 U.S. counties. By integrating empirical natural hazard impact data with social-environmental indicators for the years 2010 and 2020, we identified 22 key variables to explain resilience and derive a predictive equation applicable at a national level.

Results: Our temporal comparison shows that on average resilience level for the nation declined noticeably from a score of 2.64 to 2.30 during 2010-2020. While most of the extracted predictor variables were found to affect the resilience level of all counties, there are considerable differences in variable contribution to the resilience levels between urban and rural, suggesting the need for different emphases on resilience adaptation policies. In general, the national pattern shows the following: (1) Socioeconomic polarization: Higher home values boost resilience, while rent burden, rural housing, and limited vehicle access, reduce it. (2) Environmental trade-offs: Developed land and green cover enhance resilience through economic and ecological benefits, but wetlands correlate negatively due to flood risks. (3) Systemic inequities: Counties with more minority, elderly, and disabled populations show lower resilience, reflecting structural barriers to recovery and adaptation. (4) Civic engagement: Greater voter turnout aligns with higher resilience, reflecting the role of social infrastructure and political participation in community adaptability.

Conclusions: The RIM model advances resilience assessment by transforming hazard-specific data into a generalizable framework, while its predictor variables denote where targeted interventions can reduce vulnerability and enhance adaptive capacity. The urban-rural divide in resilience levels suggest more attention is needed to improve rural resilience for better regional integration and long-term sustainability.



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1898 - Sustainable Development Of The Tibetan Plateau National Park Cluster Under Climate Change

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The Tibetan Plateau is increasingly positioned as China's strategic core for a national-park cluster, with the "Tibetan Plateau National Park Cluster" proposed in 2017 and incorporated into the national park master plan, and with a large share of the planned national park system located on the Plateau. However, the cluster is developing under unprecedented climate-driven conditions: since 1960, the Plateau has warmed by about 0.3–0.4 °C per decade, exceeding the global average and reshaping the biophysical foundation of conservation and use. Against this backdrop, this study synthesizes multi-sector evidence to clarify how coupled temperature–moisture processes propagate through glacier resources, lake–wetland systems, and pasture carrying capacity, and how these ecological shifts interact with livelihoods and tourism development. The primary downside of warming is rapid glacier shrinkage, while meltwater can temporarily enhance landscape diversity and stimulate "last-chance tourism," creating both short-term opportunities and long-term sustainability risks. In response, stricter governance has been promoted, including placing many glacier areas within ecological protection redlines and tightening access and tourism activities to reduce disturbance. Hydrological changes are also evident in lake and wetland dynamics: rising lake levels have expanded landscape patterns, exemplified by a large increase in lake area over recent decades. These changes can encroach on pastoral land and heighten livelihood vulnerability, with documented declines in theoretical livestock carrying capacity in affected counties during certain periods. Socioeconomic adjustment is ongoing: displaced herders have diversified income sources, and tourism has become a major driver of income growth for farming and herding communities, yet it also increases resource pressures and management complexity. Overall, the sustainability challenge is framed as a balancing problem—aligning herder incomes, tourism expansion, and climate-driven ecosystem shifts—where adaptive governance and rule updates are decisive for the long-term viability of the Tibetan Plateau national-park cluster.



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2776 - The Vulnerability Of Local Agricultural Systems To Emergency Situations Evidence From Poland

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Agricultural systems located outside urban areas play a crucial role as the backbone of urban food systems. They constitute the first indispensable stage of every food chain, determining whether food production, processing, and distribution can take place at all. Under conditions of disruption, their strategic importance increases dramatically.

The aim of this study is to measure and analyse the spatial differentiation of the vulnerability of local agricultural systems in Poland to disruptions caused by emergency situations, including climatic, geopolitical, and logistical challenges. We advance the hypothesis that the vulnerability of local agricultural systems in Poland displays marked spatial variation, driven more strongly by socio-economic sensitivity and institutional–infrastructural adaptive capacity than by environmental and climatic exposure.

The theoretical framework of the study is based on the IPCC vulnerability concept as presented in the IPCC Sixth Assessment Report (AR6), Synthesis Report (2023), which defines vulnerability as a function of exposure, sensitivity, and adaptive capacity. Although this approach is well established in the scientific literature, its systematic operationalisation at the level of local administrative units (LAU) remains limited. To address this gap, we design and apply the Agricultural System Vulnerability Index (ASV), which integrates climatic, demographic, economic, and infrastructural data for all LAUs in Poland. The construction logic of the index is based on three key questions defined for each LAU: (1) exposure – what climatic risks is the unit exposed to? (2) sensitivity – how strongly does it experience impacts, and what are its structural weaknesses? and (3) adaptive capacity – what resources and capabilities does it possess to respond and adapt? Synthetic measures for these three components are derived using taxonomic analysis based on a non-pattern measure.

We argue that Poland constitutes a representative case study with both applicative and generalisation potential at the European scale. The results reveal pronounced spatial differentiation: the highest vulnerability is observed in depopulating municipalities characterised by ageing demographic structures and weak infrastructural endowments. In contrast, lower vulnerability is associated with demographically younger municipalities, higher levels of digital accessibility, and stronger functional linkages with urban markets.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Georelationality: Conceptual and Practical Framework to Cope With More-than-Humans in Regional and Urban Planning



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1894 - Has The Beijing Tianjin Hebei Coordinated Development Strategy Successfully Mitigated The Spatial Disparities Within The Beijing Tianjin Hebei Urban Agglomeration

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The regional development disparity stands as a perennial focus in the field of economic geography, drawing sustained attention from both scholars and policymakers concerned with balanced growth and spatial equity. The Beijing–Tianjin–Hebei urban agglomeration, which houses the capital of China, functions as a pivotal driver of economic development in the northern region and serves as a core engine of national competitiveness. Initiated in 2014 to address long-standing challenges such as internal developmental imbalances, excessive resource concentration, and environmental degradation, the Beijing–Tianjin–Hebei Coordinated Development Strategy encompasses multifaceted dimensions, including industrial restructuring, environmental governance, transportation integration, and market unification. This comprehensive strategy has exerted profound and far-reaching influences on patterns of regional development and spatial organization.

To quantitatively assess these dynamics, this study employs nighttime light data as a proxy indicator of economic activity and constructs the Nighttime Light Gini Coefficient to measure the spatiotemporal disparities in regional development across multiple spatial scales within the urban agglomeration. Utilizing a double-difference (DID) methodology, the research empirically examines the impact of the Coordinated Development Strategy on narrowing or widening the regional development gap across city clusters and subregions. The findings indicate that the strategy has significantly and positively contributed to the overall economic development of the Beijing–Tianjin–Hebei urban agglomeration. However, the analysis also reveals evident scale heterogeneity in the policy's effects, suggesting that while the coordinated development framework promotes aggregate growth, its capacity to narrow internal regional disparities remains uneven across different spatial levels.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Human-Earth System Feedbacks Under a Changing Climate



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1101 - The Role Of Indigenous Knowledge Systems In Strengthening Wetland Conservation In Africa Insights From South Africa Zimbabwe And Lesotho.

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Background:

Humans interact with the ecosystems around them in various ways, benefiting from both biophysical and intangible resources. Wetland conservation is crucial for protecting ecosystem services, as these areas are deeply linked to livelihoods and cultural beliefs. However, wetland degradation is particularly evident in communities that rely heavily on their environment for various purposes, including the use of wetlands. Notably, wetlands are viewed not just as water sources but also as sacred sites in many communities. This understanding fosters significant social stewardship of wetlands because humanity has become so influential over earth systems, increasing issues such as loss of natural areas and pollution. Studies indicate that many indigenous communities face challenges from modern influences, which can dilute indigenous knowledge systems (IKS); consequently, there is limited awareness of indigenous practices regarding water management, including wetlands.

Materials and methods:

The study uses a qualitative desktop approach to draw insights from African cities on the role that IKS plays in strengthening wetland conservation and its sustainability.

Results:

Africa has extensive ecosystem diversity and as such the wetlands are used for agricultural, cultural, domestic, nutritional, educational, and even spiritual purposes. African individuals rely greatly on using indigenous processes and resources for survival because IKS is community-centred and focuses on the needs of the community without degrading the natural resources. Therefore, the indigenous practices that assist with wetland conservation include imposing restrictions on certain activities to avoid degradation and attaching sacred meanings to protect the wetlands.

Conclusions:

The findings suggest that IKS is not universal but specific and tailored to culture and environmental setting, thereby making it more subjective. As such, the incorporation of IKS in policies ensures that the indigenous people's needs are met, as it is valuable to those seeking to solve community problems for future generations.



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1274 - Dietary Shift Could Mitigate Approximately 30% Food Related Land Use And Species Loss In China

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China's rapid dietary transition is intensifying pressures on land resources and biodiversity loss. However, the lifecycle land-use impacts of food consumption, associated biodiversity loss from land conversion, and the mitigation potential of dietary optimization remain systematically unquantified. Here, this study integrates the Multi-Regional Input-Output (MRIO) model with biodiversity characterization factors (CFs) to quantify the footprints of four land use types and associated Potential Species Loss (PSL) induced by Chinese food consumption from 1997 to 2017, tracing impacts via interprovincial trade. Our results show that livestock meat is the dominant driver, accounting for over 50% of China's land footprint and driving 15.15 million hectares of pasture expansion over two decades. Land-use change poses the most severe threats to plants (65% of total PSL) and amphibians (41% of animal PSL), with 79% of national PSL concentrated in five provinces, including Sichuan and Guangdong. Crucially, interprovincial trade externalizes over 90% of PSL from consumption hubs to production regions. Optimized diet patterns demonstrate significant advantages over recommended dietary patterns, reducing the national land footprint by 30-35%, PSL by 27-31%, and trade-embodied virtual land transfers by 24-41%. This research provides a scientific foundation for formulating region-specific sustainable dietary policies to reconcile food security with land conservation and biodiversity protection.



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1883 - Gully Erosion And Climate Human Feedbacks In The Loess Plateau Over The Past 300 Years A Case Of Wuding River Basin

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Gully erosion is a typical geomorphic process on the Loess Plateau, impacting the sustainable development of society. Based on historical documents, ancient maps, remote sensing images and statistical data, by calculating changes in valley erosion rates along the gully shoulder-line and integrating data on climate change and human activities we analyzed the gully erosion processes and influencing factors of the Wuding River Basin in the Loess Plateau over the past 300 years. The findings reveal that the erosion rate accelerated from the 18th century to the early 20th century, peaked in the mid-20th century, and then slowed after the 1960s. Spatially, the erosion rate exhibited a decreasing trend from the hilly areas to the mountainous, tableland, and sandy zones. Overall, the intensity of erosion exhibited a synchronous pattern with the expansion of cultivated areas, while inversely correlating with the increase in afforestation, terracing, and silt dam interventions. Significantly, early gully erosion showed a strong correlation with climate, but the correlation between erosion and climate change has become less pronounced since the 1970s. However, since the 21st century, human activities that have reduced gully erosion have led to water resource utilisation issues on the Loess Plateau, while also impacting the ecological balance of the Yellow River Delta. Concurrently, the increase in extreme weather events has heightened the safety risks associated with engineering measures. The multi-source data analysis employed in this study provides a novel approach to investigating gully erosion during the historical era and offers valuable data for sustainable development of Loess Plateau in the future.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Integrated Geography for Sustainable Development



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1032 - The Third Brazilian National Plan For Agrarian Reform A Proposal For Advancing Food Sovereignty Restoring Forests And Woodlands And Mitigating Climate Change

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The agrarian question and the agrarian reform in Brazil open to new interpretations based on an intricate interplay of old and new problems. Some of these old problems are the persistence of hunger, poverty, inequality, unemployment, discrimination, and social unrest. New problems include the intensification of massive deforestation, destruction of wetlands, degradation of rural livelihoods, devastation of biodiversity, and environmental disasters, such as severe storms and floods, droughts and extreme heat waves. All these conditions led us to rethink the agrarian question and, at the same time, to rethink the meaning and use of territory as a social, political, economic, cultural, and environmental space in the construction of new forms of agrarian reform policies. Within this multifaceted and disconcerting context, the rethinking of the agrarian question must start by challenging current hegemonic development models and approaches that promotes systemic human suffering and environmental destruction. Thus, rethinking the agrarian question is fundamental to advancing new visions and practices of community-based agrarian reform policies. These policies must promote poverty reduction, environmental sustainability, gender equality, cultural diversity, decolonization, and social justice. Without a new approach to the agrarian question, Brazil's current structural social problems will remain unresolved: the country will remain an unjust society.



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1065 - Research Framework For Integrated Geography Composite Driving–system Evolution–coupling Mechanism–synergistic Regulation

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Amid ongoing global environmental change and the critical pursuit of sustainable development, human–environment systems are exhibiting increasingly complex dynamic evolutions and spatial relationships, underscoring an urgent need for innovative research frameworks. Integrated geography synthesizes physical geography, human geography, and geographic information science, providing key frameworks for understanding complex human–environment systems. We propose an emerging research framework for integrated geography—“Composite driving–System evolution–Coupling mechanism–Synergistic regulation (CSCS)”—based on key issues such as climate change, biodiversity loss, resource scarcity, and social–ecological interactions, which have been highlighted in both recent critical literature on human–environment systems and UN assessment reports. The framework starts with diverse composite driving forces, extends to the evolution of human–environment system structures, processes, and functions that these drivers induce, explores couplings within human–environment systems, and calls for regulation aimed at sustainable development in synergies. This study identifies three core pathways for integrated geographical research. Element integration combines natural and human elements and their interactions. Process integration examines interactions among Earth’s spheres, including the human sphere, and the coupling of patterns and processes under climate and anthropogenic pressures. Regional integration synthesizes regional features and landscape patterns and promotes cross-regional whole-process coupling to transcend administrative boundaries and support territorial–spatial planning. Major research frontiers include understanding the cascading “evolution–coupling” effects of shocks; measuring system resilience, thresholds, and safe and just operating space boundaries; clarifying linkage mechanisms across scales; and achieving synergistic outcomes for multi-objective sustainability. This framework will help promote the interdisciplinary integration and development of integrated geography, and provide geographical solutions for the global sustainable development agenda.



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1088 - Geography For The Information Age Building Capacity Literacy And Sustainability In The Digital Anthropocene

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This paper argues that the Digital Anthropocene, an era in which environmental change and human activity are increasingly mediated by pervasive digital infrastructures, requires a renewed articulation of geography's role. Planetary-scale datafication through satellites, sensors, platforms and algorithmic systems has created a new informational layer that interacts with physical and human processes to shape socio-environmental outcomes. Information Geography captures the integrated analysis of physical, human and informational spaces, emphasising that information does not merely describe the world but actively structures risk perception, governance, behaviour and inequality. Building on geography's long-standing integrative tradition, the paper first examines how the discipline's spatial, contextual and relational reasoning is indispensable for interpreting complex, data-rich human-environment systems. It then explores the emergence of Intelligent Geography and the fusion of sensing, simulation and artificial intelligence (AI) in geospatial science, highlighting both the opportunities and the ethical, political and epistemic risks of AI-driven approaches. A third section reviews geography's expanding contributions to the Sustainable Development Goals, demonstrating how geospatial and information-rich methods illuminate interconnections, trade-offs and place-based pathways to sustainability. Finally, the paper argues that the future of geography in the Information Age depends on sustained investment in capacity-building and literacy, including geoliteracy, spatial, data and digital literacies that enable citizens and decision-makers to interpret and critically engage with information-rich environments. We conclude that geography is uniquely positioned to guide societies through the challenges and opportunities of the Digital Anthropocene by bridging physical, human and informational domains in support of more just and sustainable futures.



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1161 - Integrating Vulnerability And Food Practices Pathways To Sustainable And Healthy Diets

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Achieving sustainable and healthy diets for all is a central objective of contemporary sustainability agendas, including the European Green Deal and its Farm-to-Fork strategy. However, socially vulnerable populations continue to face substantial barriers in accessing nutritious and environmentally sustainable food. This paper examines how vulnerability and everyday food practices intersect, highlighting the pathways through which sustainable and healthy diets are enabled or constrained across diverse geographic, cultural, and socio-economic contexts.

The analysis draws on 50 narrative interviews conducted in Austria, Greece, Portugal, Sweden, and Turkey as part of the ACCTING project (Advancing Behavioural Change through an Inclusive Green Deal), funded by the EU's Horizon 2020 programme. Employing a gender+ intersectional framework, the study explores how individual circumstances interact with structural conditions to shape food access, consumption, and waste practices.

The findings demonstrate that economic constraints constitute the most significant barrier to sustainable and healthy diets, strongly influencing purchasing decisions and limiting access to nutritious food options. At the same time, these constraints give rise to adaptive practices, including food waste reduction, reliance on community networks, and engagement in urban gardening as a form of supplementary food production. Structural barriers, such as geographic inaccessibility and inadequate infrastructure, further restrict the availability of sustainable food.

Cultural values, beliefs, and gendered household dynamics also play a key role in shaping dietary choices. Important enablers include strong community support systems, localized food production, and increasing environmental awareness. Practices such as urban gardening and participation in solidarity networks emerge as particularly transformative, providing both material and emotional support to vulnerable groups.

Marked regional variations underscore the importance of context-specific approaches. Younger participants in Greece and Sweden display a stronger orientation towards sustainable diets, driven by education and cultural change, while narratives from Turkey and Portugal highlight the critical role of community solidarity and local production in mitigating food insecurity. By integrating economic, social, cultural, and spatial dimensions, this paper contributes to a deeper understanding of how sustainable and healthy diets can be fostered among vulnerable populations.



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1529 - Threshold Mediated Urbanization Cascades On Ecosystem Service Trade Offs In Mountainous Cities

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Background: Rapid urbanization in mountainous regions intensifies conflicts between ecosystem service (ES) supply and human demand. However, current research often overlooks how topographic thresholds and landscape patterns mediate these trade-offs through non-linear interactions across spatial scales.

Methods: Focusing on Chongqing, a mountainous megacity, we developed a novel “Constraint Line – Spatially Explicit Structural Equation Modeling” framework. By integrating Segmented Spatial Durbin Models (SDM) with Structural Equation Modeling (SEM) via spatial filtering, we disentangled local causal cascades from spatial spillovers across multiple scales (1–10 km).

Results: Challenging the view that urbanization ubiquitously exacerbates trade-offs, we identified a distinct regime shift driven by resilience thresholds. In ecologically resilient zones, urbanization is effectively decoupled from ES trade-offs ($\beta = -1.886$), acting as a “shield” against landscape fragmentation. Conversely, in vulnerable zones and at micro-scales (1 km), urbanization triggers severe negative cascading effects mediated by fragmentation. These are amplified by strong spatial spillovers ($\lambda \approx 0.9$) and topographic constraints, creating a local “lock-in” effect. Furthermore, we quantified a significant time lag of 5–12 years in anthropogenic impacts, overturning assumptions of immediate ecological response.

Conclusions: We conclude that ecological security in mountainous cities relies more on enhancing macro-scale resilience thresholds than restricting local construction footprints. This study provides a replicable paradigm for identifying “Safe and Just” operating spaces, offering threshold-based governance strategies for sustainable mountainous urbanization contributing to SDGs 11 and 15.



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1533 - Exploration Of The Evolution Of Human Nature Relationships On The Qinghai Tibet Plateau Based On The Interactive Analysis Of Ecosystem Services And Human Activities Over A 20 Year Period

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Identifying human–nature relationships are essential for supporting regional ecological security and sustainable development. However, limitations persist due to insufficiently comprehensive indicators for characterizing human and natural attributes, as well as a lack of localized analysis in exploring their interactions, hindering targeted conservation policymaking. To address these gaps, this study innovatively develops an ecosystem services integrated benefits (ESIB) index to more holistically represent natural attributes. Combined with a human activity index (HAI), we employed the median slope estimator, local clustering method, and a four-quadrant diagrammatic model to analyze the spatiotemporal evolution and local interaction characteristics of human–nature relationships on the Qinghai–Tibet Plateau (QTP) from 2000 to 2020. Results reveal significant spatial heterogeneity in both ESIB and HAI, along with divergent temporal trends. Eastern QTP exhibited notable ESIB enhancement, whereas central and western regions experienced marked HAI increases, particularly around urban clusters and major transportation routes. Ecological restoration efforts in the northwest showed limited improvement. The coupling between ESIB change rate and HAI change rate displayed evident transitional zoning and time-lag effects, leading to a distinct spatial pattern of human-nature interactions—predominantly coordinated in the eastern QTP and conflicting in south-central Tibet. Socioeconomic development and ecological restoration projects were found to considerably shape the spatial heterogeneity and dynamic evolution of these relationships, exhibiting strong regional specificity and issue-oriented characteristics. The comprehensive indicator framework and analytical methodology proposed in this study enhance the understanding of human-nature interactions on the QTP and provide a robust technical reference for future research.



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1857 - Integrated State Evaluation And Spatial Pattern Of The China's Human Environment Interaction Relationship

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Achieving a harmonious human-environment (H-E) relationship is a cornerstone of sustainable development. Consequently, evaluating contemporary regional H-E relationships is crucial for identifying pathways to reconcile existing contradictions. However, the inherent complexity of H-E systems, characterized by numerous factors and intricate interactions, poses a significant challenge to their quantification and to characterizing system states. To address this, we developed a theoretical framework that categorizes the H-E system into four interconnected dimensions within a hierarchical structure: the intensity of human activities, the support capacity of core resources, ecological constraints, and system openness. An empirical study of China revealed the following key findings. First, the intensity of human activities exhibits a distinct east-west differentiation, concentrating around major urban clusters. Second, a pronounced spatial mismatch exists between this intensity and the dispersed distribution of core resources (land, water, energy, and minerals), which exacerbates regional H-E tensions. Third, areas under strong ecological constraints are primarily located along the Hu-Line and the southwestern Qinghai-Tibet Plateau. Overall, while 85.56% of China's territory maintains a relatively loose H-E relationship, significant spatial disparities exist. H-E contradictions are most prominent in eastern and southeastern China, contrasting with the western regions, where both the intensity of contradictions and the evolution level of H-E relationships are notably lower.



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2037 - Underuse Of Common Property Resources In Changing Social Ecological Systems A Case Of Community Based Coastal Fisheries Management In Japan

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This presentation examines social-ecological changes in common-property resource use and its management in Japan's coastal small-scale fisheries, employing the concept of "underuse." Coastal fisheries management in Japan has been considered one of the most successful cases of community-based resource management systems in the world. However, depopulation and aging have weakened the social foundations of local fishing communities, making customary fisheries management practices difficult—and in some cases even meaningless—to maintain, as competition in resource use has declined. Under these conditions, the primary challenge is not resource overuse—traditionally emphasized in fisheries management studies—but rather resource underuse and the associated socio-ecological consequences.

Changes in the marine environment, such as alterations to coastal ecosystems, also present unprecedented challenges for local fishing communities. In some cases, these changes stimulate adaptive transformations in customary fisheries management. In others, however, resource depletion and deteriorating environmental conditions compel fishers to retire or to shift to different types of fisheries, leading to the withdrawal or simplification of local community-based fisheries management.

Although the problem of underuse is often discussed in the context of conservation ecology, the forms of underuse extend beyond ecological dimensions. They also encompass spatial, institutional, technological, functional, and cultural aspects of local resource use. Drawing on an empirical case study of Japan's coastal small-scale fisheries, this presentation examines the multifaceted nature of underuse and considers how local socio-ecological relationships can be sustained amid depopulation and regional shrinkage.



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2350 - Integration Of Data Assimilation And Reinforcement Learning Empowering Earth System Governance And Sustainable Development

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The application of big data and artificial intelligence in Earth system science has become increasingly widespread, substantially advancing the assessment, management, and decision-making for sustainable development. However, the insufficient interpretability of geoscience artificial intelligence poses a significant challenge that constrains its further advancement. To address this challenge, we propose that the interpretability of geoscience artificial intelligence can be effectively enhanced by integrating two core methodologies: data assimilation and reinforcement learning. Data assimilation represents a classical methodological framework in Earth system science that effectively improves the observability and predictability of Earth systems by combining dynamic models with multi-source observational data. The Bellman equation, which constitutes the core of reinforcement learning, is inherently suited to simulating human-environment interactions and possesses the capabilities of adaptive learning and optimization, thereby enabling effective responses to the complexity of Earth systems and enhancing the interpretability of decision-making processes. Building upon a comprehensive review of the latest advances in these two methodological approaches, we attempt to propose a general mathematical modeling framework for addressing the simulation and decision-making challenges in complex human-Earth systems. This model employs the Markov decision process as the dynamic framework, utilizes the Bellman equation as the mathematical foundation, adopts multi-agent deep reinforcement learning as the algorithmic framework, and leverages big data assimilation as the methodology for enhancing the predictability and observability of human-Earth systems. Through the integration of these methodologies, this framework aims to enhance the application potential of big data and artificial intelligence in sustainable development, achieve optimization and management of future development trajectories of the Earth system, and provide advanced solutions to decision-making challenges in Earth system governance and sustainable development.



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2356 - Dynamic Assessment Of Ecosystem Service Response And Sustainable Development On The Qinghai Tibet Plateau In The Context Of Ecological Engineering

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In response to the degradation of ecosystems caused by human activities and climate change, In order to protect the alpine ecosystems of the Tibetan Plateau, a number of major ecological projects have been carried out in the region since the end of the twentieth century, including the return of farmland to forests, the return of pasture to grassland, the protection of natural forests, and the construction of the Three Rivers Reserve. We integrates the United Nations' 2030 Sustainable Development Goals (SDGs) assessment framework and focuses on the ecosystem services and the SDGs as the two core indicators, to comprehensively assess the impacts on ecosystem services and sustainability of the Tibetan Plateau since the ecological projects have been implemented. The impacts of the ecological project on ecosystem services and sustainable development on the Tibetan Plateau since its implementation were comprehensively assessed, and the distribution of the key implementation areas of the ecological project under future climate and land use scenarios were explored.

since the implementation of the ecological project, the NDVI of the Qinghai-Tibet Plateau region shows an overall increasing trend, in which the areas with significant increase are concentrated in the northern and southeastern regions of the plateau, occupying 21.80% of the total area of the plateau; And the relationships among the three major groups of ecosystem provisioning services, regulating services and supporting services have maintained an overall synergistic relationship, Furthermore, Based on the ecosystem services contribution to SDGs (ESSDG) calculated in the framework of 'ecosystem services-SDGs', we found that the average ESSDG score of Qinghai-Tibet Plateau counties has increased from 40.32 to 42.42 and the spatial distribution has been higher in the southeast and higher in the northwest, and the spatial distribution has been higher in the south-east and higher in the north-west, which generally indicates that the level of development of the SDGs process on the Qinghai-Tibet Plateau is gradually higher than the level of ecosystem services provision.

We draw a conclusion about the priority areas for future ecological project implementation under the different scenarios were mainly distributed in the southern and southeastern parts of the plateau.



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2474 - Designing Governance For Sustainability In A Regional Bay Area In Southern Brazilian Coast

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This research explores heterodoxic elements of regional governance in a protected area Bay zone at Southern Brazilian Coast: Paranaguá Bay Zone. Large bodies of water in coastal areas constitute transitional environments between the ocean and the continent, encompassing landscapes of great importance for biodiversity and climate change. Bays and estuaries systems are wetscapes areas of high ecological importance within the Earth system. Their geophysical, ecosystemic, and sociodiverse characteristics result in complex and unique interactions that require integrated analytical capabilities to promote quality governance. The objective of the project is to design a methodological framework of regional governance to estuarine protected area, offering a rational pathway in management agenda. Considering the interdisciplinary aspects and the nature-based regulatory structure in the scene, an analytical model was built since three main thematic sections: geodynamic, biodiversity and social activities. The increase of three fundamental topics of interest for society expected in institutions and legislation catalyze the spatial insurgence of areas of special interest (ASI) for governance throughout the estuarine territory, which are: conflicts, impacts and synergies (CIS). The interaction of both allows to identify the CIS scenarios and map ASI areas for regulatory institutions. The preliminary results allow to compose a strategic map oriented to ordinary solutions in the field. In this way, the various stakeholders understand the decision-making channels through which their demands can be met, and the management body assumes its leadership role in implementing this management agenda.



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2633 - Iii National Research On Education In Agrarian Reform (pnera)

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The National Program for Education in Agrarian Reform (PRONERA) is a public policy created in the 1990s to address the State's educational debt towards populations in agrarian reform areas. Providing opportunities for literacy, secondary education, bachelor's degrees, teacher training, specializations, and master's degrees, this program has, according to preliminary research results, conducted 540 courses and offered over 100,000 spots to rural students from all Brazilian regions. Funded by the National Institute for Colonization and Agrarian Reform (INCRA) and the Ministry of Agrarian Development and Family Farming (MDA), this research aims to present preliminary elements of a quantitative and qualitative diagnosis of the current situation of one of the most important policies for sustainable territorial development in agrarian reform areas in Brazil, a country marked by the struggle for Agrarian Reform and violent conflicts in the countryside. Its results will contribute to governmental assessments that may guide the future of public policy or highlight the need to change the profile of actions to meet new demands for courses focused on the territorial development of agrarian reform areas. The analyses were obtained through the examination of qualitative and quantitative data, forming a database consisting of comprehensive information on courses, students, and institutions, among other details. Implementing artificial intelligence techniques will allow us to obtain more accurate statistical analyses for identifying patterns and deviations, as well as more comprehensive curation for mapping the phenomenon. In parallel, we will conduct interviews with former students from all benefiting federal units to understand the qualitative elements of the policy. The research results will be shared with the managers of the National Institute for Colonization and Agrarian Reform (INCRA) and the Ministry of Agrarian Development and Family Farming (MDA).



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3226 - Chinese Geographical Journals And Their Achievements

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This paper introduces the number of geography journals in China and their contributions to the development of geography in China. Taking the Journal of Geographical Sciences as an example, this paper provides a comprehensive introduction to the development of the journal. Launched in 1990, Journal of Geographical Sciences is co-sponsored by the Geographical Society of China and the Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences. The journal aims to strengthen the academic exchange of geographic information between China and other countries, and to offer a publication for exchanging academic ideas between geographers around the world. It publishes articles related to physical processes and the spatial pattern of the Earth's surface, physico-geographical elements and their interaction, global change and its regional response, characterization and management of natural resources, landscape ecology and environmental construction, remote sensing, geographic information systems and their applications in geographical research, and other related topics. This paper analyzed the main indicators, i.e., impact factor, total cites, number of full-text downloads, citing journals, and cited journals. These data were obtained from the JCR report, the Web of Science database, and the Springer database during 2009-2025. The main citation indicators of the JGS have continued to improve and its international impact has kept increasing. The impact factor increased from 0.518 in 2009 to 5.2 in 2024. The journal has been consistently awarded the title "China's Most Internationally Influential Academic Journal" from 2012 to 2025. Despite the improvements made over all of these indicators, the journal still has room for further improvement, especially with regard to the quality of international submissions, the quantity of submissions from developed countries, and the number of published papers led by international organizations.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Landscape Sustainability Science and the Sustainable Development Goals



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1369 - Which Type Of Urban Vertical Expansion Did Dominate In Chinese Cities During 2000–2020
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Background/Hypothesis: Urban vertical expansion plays a critical role in shaping urban morphology and profoundly influences urban environment, which is highly important for the sustainable development of cities. However, a clear and quantitative understanding of the vertical expansion mode of Chinese cities is still lacking.

Materials and methods: This study used five types of data, and quantified the spatiotemporal dynamics of urban vertical expansion modes in China from 2000 to 2020, and analyzed their driving forces. First, we calculated the mean annual volume increment and mean annual growth rate of the vertical expansion from 336 prefecture-level cities in China and examined the differences among scales. Second, we introduced the vertical landscape expansion index to classify urban vertical expansion into three modes: renewal vertical expansion (RVE), edge vertical expansion (EVE) and leapfrog vertical expansion (LVE), and quantified the spatiotemporal changes in Chinese cities. Finally, we explored the driving mechanisms of urban vertical expansion modes through machine learning and multiple logistic regression analysis.

Results: From 2000 to 2020, the mean annual volume increment and mean annual growth rate of the vertical expansion showed a trend of slowing down. Among the urban vertical expansion modes, RVE was the dominant mode, with its share increased from 62.0% during 2000–2010 to 67.8% during 2010–2020. In terms of the driving forces of the RVE, economic growth played a consistently leading role, with its relative importance increased over time, while that of environmental factors declined.

Conclusions: In the context of a slowdown in both the overall increase and the growth rate of urban vertical expansion in China from 2000 to 2020, the RVE mode of cities, that is vertical expansion within existing urban areas, has dominated, and its proportion has been continuously increasing. With respect to the driving forces of the RVE mode, GDP growth was dominant, and its contribution continued to increase, while the influence of environmental factors decreased. In the future, urban renewal should align with economic development objectives and be designed to minimize environmental disruption.



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1472 - Rethinking Urban Ecosystem Service Flow Through Human Mobility The Neighborhood Effect Averaging Problem

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Urban ecosystem services (ES) provide essential benefits for human health, but residents' actual use of these services—termed ecosystem service flows—depends not only on local biophysical conditions but also on patterns of human daily mobility. Using Shanghai as a case study, this research integrates large-scale mobile phone signaling data with high-resolution ES datasets to compare residential-based ES flows and mobility-based ES flows for three health-related ES: air purification, urban cooling, and park recreation. Key findings reveal: (1) When human mobility is considered, individual experiences of ES tend to converge toward the average level within the study area—a phenomenon known as the neighborhood effect averaging problem (NEAP); (2) Low-income residents, who travel longer distances and spend more time away from home, exhibit a stronger NEAP effect than high-income residents; (3) Scenario simulations indicate that NEAP arises from the interaction between spatial heterogeneity in ES supply and human mobility patterns, where lower spatial variability weakens NEAP and longer travel distances amplify it. These results underscore the critical importance of incorporating human mobility into assessments of urban ES flows, with significant implications for equitable urban planning and environmental justice. Importantly, ignoring population mobility may mask real disparities in access to ecological services across different social groups, thereby undermining the effectiveness of public policies. Future urban ecosystem management should account for dynamic population distributions to optimize the spatiotemporal allocation of service facilities and address ecological service inequalities faced by vulnerable populations.



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2341 - Spatial Patterns Driving Forces And Potential Grain Losses Of Non Grain Production Of Farmland In Central Yunnan Urban Agglomeration China

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The conversion of farmland to non-grain production (NGP) poses a potential threat to food supply security and the protection of agricultural land. With the advancement of urbanization and economic development, such conversion has become increasingly prevalent in China. Although many studies have been conducted, the spatial pattern, driving forces, and potential losses in grain production associated with NGP in Southwestern China remain inadequately addressed. In this study, an analytical framework was developed by integrating spatial statistics, the geographical detector model, and landscape pattern indices. Using data from China's Third National Land Survey (TNLS), an in-depth analysis was performed to explore the extent, spatial pattern, driving factors, and potential grain losses of NGP in the Central Yunnan Urban Agglomeration (CYUA) by using the Third Land Survey (CTLS) data of China. The results indicate that the average NGP rate in the CYUA is 30.68%, displaying a distinct “core–periphery” spatial pattern and being predominated by driven by adjustments in the planting structure. Mean patch size (MPS), distance to county center (DCC), and mean rural income (MRI) were identified as the key factors influencing NGP. Compared to a 24.56% reduction in grain-sown area, NGP has resulted in a 43.38% loss in grain production, which significantly undermines regional food self-sufficiency. Moreover, the spatial distribution of NGP intensity is not fully consistent with that of grain production losses. This study presents the first comprehensive, closed-loop analysis of regional NGP—from pattern identification to governance strategy formulation. The proposed NGP typology and region-specific governance recommendations provide targeted scientific support for addressing NGP-related challenges and safeguarding regional food security.



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2557 - Study Of Ecosystem Responce To Global Warming In Russia Based On Remote Sensing Data

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The study investigates the response of key surface characteristics (the NDVI vegetation index, albedo, and surface temperature) in Russian regions most susceptible to summer warming. The analysis of their dynamics was used to assess ecosystem evolution under climate change conditions.

For the analysis, MODIS data from the period 2000–2025 with a spatial resolution of 0.05° were used: NDVI (MOD13C2 product), albedo (MCD43C1), and surface temperature (MOD11C3). To interpret the processes, a method for classifying surface temperature regulation types based on the direction of the relationship between albedo and temperature was applied.

The following results were obtained:

1. In the subboreal zone of southern European Russia, increased summer warming is accompanied by an expansion of areas with a radiative type of regulation (negative albedo-temperature relationship), characteristic of poorly developed or absent vegetation cover. The growth of such areas, calculated from trends for the summer months, indicates the formation of new seasonal hotspots of desertification and vegetation degradation.
2. In the boreal zone of southern Central Siberia, an evapotranspirational type of regulation (positive albedo-temperature relationship) predominates. However, under extreme temperature increases or following fires, areas with a radiative type appear here in a mosaic pattern.
3. In the subarctic zone of northern Central Siberia, warming, on the contrary, leads to a reduction in areas with a radiative type of regulation due to increased bioproductivity associated with the growth of phytomass.

The obtained results suggest that further increases in air temperature will contribute to:

- The expansion of areas with a radiative type of temperature regulation in the subboreal zone;
- The persistence and mosaic emergence of such areas in the boreal and subarctic zones.

The actual extent and distribution of these areas are determined by a combination of factors, including topography, local environmental and climatic conditions.

This study was carried out with support from a grant from the Ministry of Education and Science of the Russian Federation (agreement no. 075-15-2024-554 of April 24, 2024).



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2723 - Forest Landscapes Sustainable Development And Conflicts

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French forests provide numerous ecosystem services: wood and non-wood forest products; carbon sequestration and storage; leisure and recreational activities; biodiversity, etc. These services give rise to competing uses and expectations, causing tensions and even conflicts. These conflicts are not new, but they are now more acute, especially as forests are affected by climate change: die-offs are increasing and choices must be made between taking action or letting nature take its course. One of the increasingly favored approaches is planting, although this remains a minority option compared to natural regeneration. It crystallizes tensions, where landscapes can be called upon for their aesthetic value. But could they not be a path to more sustainable development? We will draw on testimonials from forestry stakeholders (from upstream to downstream of the sector), local stakeholders (elected official, representative of nature conservation associations, etc.) and users (hikers, cycle tourists) collected in the Centre-Val de Loire region: they were questioned in semi-structured interviews to gain a better understanding of their views on forest plantations and their place in the landscape. We will show that, in a spatial sense, landscapes can become a solution for reconciliation: the mosaic landscape is now a promoted way of allowing forests to be multifunctional.



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**C24.14-Geography and Sustainability (Geography
for Future Earth: Coupled Human-Earth Systems for
Sustainability) => Viable Sustainability**



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1910 - The Integration Of Esg Principles In The Operations And Event Practices Of Organic Wine Enterprises In Hungary

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Background and Research Questions

Organic wine enterprises operate at the intersection of agriculture, tourism, and event management, making them particularly exposed to environmental pressures while simultaneously positioning them as key actors in sustainability-oriented adaptation. While Environmental, Social, and Governance (ESG) principles are increasingly embedded in regulatory and corporate discourse, less is known about how these principles are translated into everyday organisational practices within small and medium-sized enterprises. Existing research predominantly focuses on production-related sustainability, leaving the role of tourism and event practices underexplored. This study addresses two research questions: how ESG principles are integrated into the everyday operations of organic wine enterprises (RQ1), and how event practices contribute to the practical implementation of sustainability-oriented strategies at the local level (RQ2).

Materials and Methods

The study applies a qualitative research design based on 15 semi-structured expert interviews conducted with owners, managers, and event coordinators of organic wine enterprises in Hungary. Data collection takes place during the first and second quarters of 2025, following a predefined and thematically organised interview guide. The interviews focus on operational decision-making, sustainability-related practices, and the role of events in communicating and enacting ESG principles. All interviews are transcribed verbatim and analysed using inductive thematic coding supported by NVivo software.

Results

In relation to the first research question, the expected findings suggest that ESG principles are integrated unevenly across organisational practices. Environmental measures are anticipated to include water-saving solutions, biodiversity-supportive vineyard management, renewable energy use, and low-impact event logistics. Social dimensions are expected to manifest through community engagement, knowledge-sharing, and visitor education during winery events. Governance-related practices may emphasise transparency, long-term responsibility, and stakeholder relationships. Addressing the second research question, events are expected to function as practical arenas where sustainability principles are tested, communicated, and adapted to organisational and local constraints. Financial and regulatory limitations are likely to shape the depth and scalability of these practices.

Conclusions

The study highlights the role of winery-based events as integral components of sustainability-oriented organisational practice. By embedding ESG principles into everyday operations and event activities, organic wine enterprises contribute to locally grounded and practically viable sustainability pathways. The findings offer insights for sustainability research and tourism geography.



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2342 - Extreme Events And Time Geography For Deep And Transformative Learning

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Extreme events can be caused by human society, such as wars, terrorism, and financial crises, or they can originate in the natural world outside of humans, such as natural disasters and pandemics. In the Anthropocene, even naturally occurring extreme events have become more frequent due to human activities, just as global warming has caused frequent extreme weather such as heavy rainfall disasters and increased global migration and trips have caused the rapid spread of corona-viruses. Time-geography has focused on everyday life. The nature of everyday life is routine and mundaneness. Extreme events interrupt the routine of daily life and force changes in spatio-temporal human activities, and the “constraints,” a key concept in time geography, works differently there. The pandemic, for example, has increased the time spent at the home as a station. What is at work there is not so much “coupling constraints” that one must be coupled with the home, but rather “authority constraints” that restrict outdoor activities through lockdown and quarantine. In the event of a natural disaster, the key project is to escape from the hazardous place before coupling with a safe location. This study examines how time-geography can be used to understand human behavior during extreme events, especially as it applies to the preparedness of natural disasters.



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2552 - Spatio Temporal Evolution Of Ecological Product Value Realization In Inner Mongolia Of China Towards Viable Sustainability

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Background/Hypothesis: As a key ecological functional area in northern China, Inner Mongolia's ecological product value realization (EPVR) is pivotal for constructing the northern ecological security barrier and exploring paths towards viable sustainability. Clarifying its spatio-temporal evolution and obstacle factors provides a basis for balancing ecological protection and high-quality development.

Materials and Methods: An index system was built from three dimensions—ecological environment optimization, ecological economic development, and human well-being improvement. Using data from Inner Mongolia's 12 leagues/cities during 2012–2022, entropy method, spatial autocorrelation model, and obstacle degree model were adopted to evaluate EPVR levels and identify obstacles.

Results: (1) EPVR showed a steady fluctuating upward trend, with the average comprehensive benefit rising from 0.317 to 0.421. (2) Spatially, it presented “eastern leading, central-western following” characteristics; regional differences narrowed, dominated by inter-regional gaps, with positive spatial spillover and prominent “high-high” and “low-low” agglomeration. (3) Obstacles mainly lied in ecological environment optimization, with per capita water resources and PM2.5 concentration as core influencing factors (frequency 91%).

Conclusions: This study reveals the spatio-temporal rules and key obstacles of EPVR in Inner Mongolia of China. The proposed countermeasures, such as differentiated paths and inter-regional coordination, provide support for accelerating ecological value transformation and advancing viable sustainability.



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2555 - Redelimitation And Characterization Of The Natura 2000 Network. Case Study Of Extremadura. Spain

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The work will present the research developed within the framework of a research collaboration agreement for the elaboration of a study on the “redelimitation and characterization of the Natura 2000 Network in the Autonomous Community of Extremadura. The main objective of this research is to comprehensively review the management of the sites included in the Natura 2000 Network in Extremadura.

The implementation of conservation strategies will be comparatively evaluated in order to identify the main challenges and areas for improvement. Through the study of scientific and technical documentation and other documents from official bodies, actions will be proposed to make conservation and development compatible in these areas.

Successful or unsuccessful cases at some of the territorial levels will be studied as reference models for the design of recommendations with the purpose of achieving complementarity and compatibility. Representatives of local communities, managers, social agents and other stakeholders should be involved in this work through consultation interviews or the provision of documentation. This collective participation will make it possible to identify real challenges from different perspectives and possible direct and indirect solutions in the management of these protected areas.

With all this, specific and/or general recommendations aimed at improving the management of Natura 2000 Network sites in Extremadura and the compatibility of conservation and development may be proposed. Priority will be given to recommendations aimed at a more balanced management that makes it possible to reconcile conservation and development. This process will make it possible to generate solid and viable proposals of recommendations to improve management, promote conservation and make land use compatible in different socioeconomic and geographical contexts.

Therefore, in order to ensure sustainable development in these protected areas, it is essential to adopt an integrated perspective that considers both environmental and socioeconomic aspects. Adequate planning and the active participation of stakeholders are essential elements in finding balanced solutions that protect biodiversity while promoting the well-being of the population. Furthermore, collaboration and information exchange at the local, regional, national and European level is essential to address sustainable development challenges and ensure coherence in the management of the Natura 2000 Network in different socioeconomic and geographical contexts.



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C24.15-Geography of Governance => AI for Urban Governance; Opportunities and Challenges



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1057 - Urban Governance And Ai To Improve Environmental Quality And Collective Well Being

Anna Trono¹

Co-chair Igu Cgog, Igu Geography Of Governance, Lecce-Italy ¹

Contemporary cities are undergoing a process of renewal that requires new forms of coordination and planning. Artificial intelligence in the urban context appears to be a tool capable of accelerating this transformation, providing advanced analytical support for complex and multidisciplinary processes. The potential impact of AI solutions on cities is vast, ranging from improving environmental quality to reducing traffic, from security to the provision of public services, but the real challenge lies in balancing effectiveness and the protection of rights. It is important to combine technological expertise with ethical and forward-thinking planning. This is a complex but not unattainable balance, requiring collaboration between institutions, businesses and local communities.

Therefore, one should define a systematic approach to assessing and monitoring the ethical impact of digital solutions in urban infrastructure, focusing on the protection of people and the environment. It is appropriate to define rules for stakeholder involvement: citizens, NGOs and research centres should be included in the design and implementation phases of projects to ensure a human-centric approach to the design of infrastructure and digital solutions. It is consequently essential to integrate AI into city governance strategies, while recognising the ethical limitations of these new technologies and the responsibilities arising from their use.

Artificial intelligence must therefore be understood not only as an engine of economic growth, but also as a catalyst for collective well-being, if managed rationally and collectively, and with a view to participatory governance, as highlighted in some case studies.



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1813 - Modeling The Impact Of Urban Expansion On Planning Using Forest Based And Gradient Boosted Approaches

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Urban expansion is a significant phenomenon that shapes the socio-economic and environmental landscapes of cities worldwide. As urban areas continue to expand, understanding their patterns and drivers is becoming increasingly important for efficient urban planning and management. This study applied forest-based and gradient boosted methods to model urban expansion with a view to providing insight into urban growth patterns and their impact on urban planning. The flexibility of these models over traditional statistical approaches is that they allow for the incorporation of non-linear relationships, which are often present in urban growth patterns. Sentinel 2 data, landuse records, demographic information, and socio-economic indicators were utilised. To implement the models, the data were split into training and validation subsets. The k-fold cross-validation was employed to ensure that the models are not overfitting to the training data. The study revealed that the Forest-based model achieved an overall accuracy of 87%, indicating a strong capability to correctly classify urban and non-urban areas. The model also recorded 82% and 85% representing precision and recall metrics, respectively, indicating that the model not only correctly identifies a substantial proportion of actual urban areas but also minimizes false positives, which is crucial for effective urban planning. Similarly, the Gradient Boosting model (GBM) achieved an impressive accuracy of 90%, surpassing the Forest-based model. This enhanced performance can be attributed to the model's iterative approach, which focuses on correcting errors made by previous iterations. The ability to learn from mistakes allows the GBM to refine its predictions continuously, resulting in a more accurate representation of urban growth patterns. The GMB recorded a precision of 88% and a recall of 87%, indicating that the GBM not only excels in identifying urban areas but also maintains a low rate of false positives. The study further revealed that the growth of Jimeta-Yola is not homogeneous, but rather influenced by various socio-economic and environmental factors. Areas with a higher population density and economic activity tend to urbanize rapidly than peripheral areas. The study also identifies specific land use changes linked to urbanization, such as the conversion of farmland into residential and commercial development.



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2116 - Visualising Gender Parity In Six Zones Of India A Geospatial And Ai Enabled Women Empowerment

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The dissemination of the Women Empowerment Atlas of India is a pioneering geovisualisation initiative that integrates more than 400 gender-disaggregated indicators across 10 themes nationwide. This paper highlights how the Atlas uses data science, geospatial analytics, and geospatial visualization techniques to transform complex gender-disaggregated data into accessible, policy-relevant insights. Ongoing research project sanctioned by the SEED Division, Ministry of Science & Technology, Government of India (GoI) aims at Zonal Implementation and Utilization of Women Empowerment Atlas of India for Capacity Building across six zones of India. The project is an extension of the Women Empowerment Atlas of India (Parihar, 2022), which was launched by the Honorable Minister of Science and Technology and incorporates 300+ gender-disaggregated data. The first and second Atlases published were “Gender Atlas of India -A Geospatial Perspective” (Parihar, 2015) with 100+ gender-disaggregated data and “Gender Atlas of India -A Thematic Perspective” (Parihar, 2016) with 188+ gender-disaggregated data, as deliverables of the two projects sanctioned by the Ministry of Women and Child Development, Government of India. Building on this foundation, the paper examines how the Atlas is being advanced into an AI-enabled platform that incorporates intelligent analytics, pattern recognition, and predictive tools to support evidence-based gender mainstreaming. The aim is to illustrate on how target interventions can be made using artificial intelligence capabilities, enabling dynamic querying, identification of spatial gender gaps, and scenario-based insights. To ensure equitable access and national outreach, the Atlas is being disseminated across six geographic zones of India- North, Northeast, South, Central, West and East zones. Multiple training programmes and prepared manuals are fostering capacity building among policymakers, researchers, administrators, and civil society stakeholders. The project promises and illustrates how Geospatial AI can empower women, inform inclusive policies, support data-driven pathways, and drive social transformation, equitable and resilient societies.



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2117 - Tirana's Traffic Dilemma Ai Solutions In A Car Centric Urban Landscape

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As Tirana navigates the complexities of rapid urbanization, the integration of artificial intelligence (AI) emerges as a transformative opportunity to enhance urban governance, particularly in improving traffic management and reducing travel times. This paper investigates the dual potential of AI to address immediate challenges while questioning the broader sustainability of a wheel-centered city with limited public transportation options.

Tirana's explosive growth, marked by extensive construction and an emerging middle class predominantly dependent on car ownership, intensifies the need for efficient traffic solutions. Despite AI's promise to optimize traffic flow and predict congestion patterns, it raises critical questions: Can a city overly reliant on cars and characterized by neglected public transport systems genuinely achieve sustainability through AI? The answer lies in recognizing that while AI can facilitate short-term improvements in traffic management, it cannot alone remedy the systemic issues of urban planning and infrastructure.

Moreover, the persistent neglect of public transportation and continuous suburban expansion compounds traffic challenges, particularly during peak hours. As gentrification pushes residents toward personal vehicles and outlying areas, the lack of a comprehensive public transit strategy places increased pressure on road networks. AI may enhance operational efficiency, yet without concerted efforts to revitalize public transport and integrate sustainable land-use policies, the quality of urban life may not significantly improve.

This paper aims to contribute to the discourse on urban governance by examining the intersections of AI technology, urban expansion, and sustainability challenges in Tirana. Ultimately, it raises a pivotal question: Can a city focused on automobile reliance and deficient public transportation transition into a sustainable urban environment, even through advanced AI applications in traffic management?



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2452 - Why Geoai Must Be Explainable Bridging Geography Urban Governance And Xai

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Geographic Artificial Intelligence (GeoAI) is an interdisciplinary field within Geographic Information Science (GIScience) (Goodchild, 2004; Hu et al., 2024) that uses methods and approaches from Artificial Intelligence to identify spatiotemporal patterns and make predictions, producing geolocated knowledge to support decision-making (Gao, 2020; Janowicz et al., 2020). GeoAI also incorporates machine learning methods and sense of place perspectives (Janowicz, 2024) and has enormous potentiality for urban planning and governance.

Gao (2023) argues that incorporating (Human) Geography into AI analyses is essential for addressing global challenges such as poverty, disaster vulnerability, and inequalities in resource distribution. He also emphasizes the importance of avoiding or minimizing AI model bias by accounting for socioeconomic, historical, and cultural contexts.

In this regard, an important area for further development in GeoAI is eXplainable Artificial Intelligence (XAI). XAI aims to explain AI models' internal mechanisms and decision-making processes to humans. XAI can be linked to other human-in-the-loop AI concepts, such as Active Learning (AL), Curriculum Learning (CL), Usable AI, and Useful AI (Mosqueira-Rey et al., 2023). Together, these approaches support the development of fair, reliable, informative, transferable, and accessible AI models (Barredo Arrieta et al., 2020).

An additional challenge for GeoAI lies in adapting and applying XAI methods specifically to GeoAI models. Several XAI techniques have been proposed, including LIME, SHAP, and TCAV. This research presents a taxonomy of XAI methods, links them to GeoAI approaches, and situates them within GIScience paradigms and Urban Governance considerations. Finally, it discusses future directions for AI in Geography and Urban Governance.

By bridging Geography, Urban Governance and XAI, this research advances interpretable and context-aware spatial AI frameworks for the city. Ultimately, the study positions explainable GeoAI as a key pathway for integrating technical urban innovation with human-centered geographic knowledge.



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C24.15-Geography of Governance => Local and Urban Governance: Trends, Challenges, and Innovations



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1009 - How Does Urban Emotional Intelligence Influence Urban Innovation Unpacking The Impact Mechanism With Empirical Evidence From 240 Prefecture Level And Above Cities In China

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Abstract□ Cities are often conceptualized as organic living organisms. However, existing research on urban innovation seldom adopts this perspective. Most studies emphasize urban intelligence (UI), while overlooking the role of urban emotional intelligence (UEI) in shaping urban development and innovation. To address this gap, we proposes a theoretical framework and measurement system grounded in urban organism theory, and empirically examines both overall and across its sub-dimensions —and its effects on urban innovation based on the data of 240 prefecture-level and above cities in China during the year of 2014-2021. The results reveal three key findings: (1) UEI is a vital attribute of cities, corresponding to UI, and the theory of UEI offers a superior explanation for urban innovation in the perspective in contrast to established frameworks such as the 3T theory (Talent, Technology, Tolerance) and the 3S model (Skill, Sun, Sprawl). (2) Empirical analysis of Chinese cities reveals UEI and its sub-dimension of the emotional foundation and Emotional Capacity exert s significant positive impact on urban innovation and emotional foundation including Citizen-Oriented openness and integrity, among these, Citizen-Oriented openness can effectively promote urban innovation, while integrity has a negative impact on urban innovation, Emotional Capacity including coordination, stability and Pioneer can enhance urban innovation. The UEI effect on urban innovation exists spatial heterogeneity: the impact is the strongest in eastern China, followed by central China, then Northeast China, and finally western China. (3) The relationship between UEI and urban innovation is partially mediated by talent agglomeration. These findings suggest that strengthening the emotional and relational fabric of cities can serve as a vital lever for fostering more inclusive and dynamic urban innovation.



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1050 - Cycling The Urban Cycling Exploring Taipei's Youbike System And Its Bounded Esg Under Developmental Entrepreneurialism

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This paper views the privatized urban cycling systems as capital circuit in the built environment. Supplier's long-term operation relies on stable profits favoring expanded capitalist reproduction. As urban infrastructure, however, urban cycling needs policy assistance from municipalities to shape investment climate, while seeking new market niches to catalyze innovation. Even if its campaigns announce socially responsible and environmentally friendly rhetoric, the system's survival depends on stable capital circulation coupled by policy and the market. Unlike the partnering notions from the mainstream studies on urban entrepreneurialism, this study argues that the policy-market coupling in each city results in variegated geographies of entrepreneurial governance owing to different municipal milieu across countries. This article takes the setup, transfer, and upgrade of Giant's YouBike system in Taipei as a case study, arguing that the experience is the product of Taiwan's institutional atmosphere of urban governance – “developmental-inherited entrepreneurialism” – “policy guidance fostering market innovation”. YouBike's achievement and its sustainability-based ESG discourse are driven by favorable industrial policies and municipal goals as well as new market leading-edges under developmental-inherited entrepreneurialism. Nevertheless, the policy-fix that capital circulation relies on will be adjusted as the government goals change, and the potential competitors for new markets will emerge anytime. The practice of YouBike's ESG is constrained owing to new competitors and the risk of broken up partnership once the contract has expired.



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1073 - Agency And Path Development In Romanian Small Towns

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Alexandru Ioan Cuza University Of Iasi, Department Of Geography, Iasi-Romania¹

Small towns are confronted to a wide range of challenges, such as shrinking population, economic decline and shortage of opportunities. These challenges are even more intense in the post-socialist context, where the progressive diminution of the state role in local development, combined with inherited institutional structures often act as barriers against creating new development paths. The present paper focuses on the mechanisms involved in the development paths of four post-socialist small towns in Romania, inquiring the key moments, stakeholders and resources that shaped the transition process. We follow a qualitative comparative case study methodology, based on the triangulation of sources (interviews, local planning documents, monographies, micro-data), in order to trace each local development path. The agency in the four cases is compared based on the “trinity of change agency” framework of Grillitsch & Sotarauta (2020), including the distinction between change and reproductive agency introduced by Baekkelund (2021). The qualitative research design is structured around the following questions: How local agency manage to grasp opportunity spaces to insure survival/development? ; Which are the actors that drive change/maintenance and how they act in this process?; How actors perceive and approach structural preconditions /inherited elements and external opportunities or threats across the process? We aim to explain how local assets, combined with different kinds of agency, shape new development paths that are able to offer social and economic opportunities for the local population.



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1145 - Local Governments And Sustainable Development Goal 11.1 – Access To Adequate Housing And Basic Services A Capacity Assessment In Trinidad And Tobago

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From a global perspective, the trend towards Sustainable Development Goal (SDG) 11: “Make Cities and Human Settlements Inclusive, Safe, Resilient, and Sustainable” is decreasing. The goal’s target, SDG 11.1, “By 2030, ensure access for all to adequate, safe, and affordable housing, basic services, and upgrade slums,” seems hard to achieve for many cities worldwide. Estimates indicate that Caribbean Small Island Developing States (CSIDS), particularly Trinidad and Tobago, has one of the highest percentages of its population living in informal settlements, 24.7%, after Haiti (74.4%) and Jamaica (60.5%). Local governments are essential for effectively implementing the SDGs, particularly Goal 11, and relevant targets, which can only succeed if integrated into both national and local processes. To strengthen local government and further decentralise urban planning, Trinidad and Tobago reformed and restructured its local government under the Planning and Facilitation of Development Act in 2014. However, it is questionable to what extent the organisational capacities of local governments, so-called municipal corporations (MCs), in Trinidad and Tobago can facilitate the localisation of SDG 11.1. Hence, the work will present the assessment results of a study that investigated the enabling environment of all fourteen (14) MCs in Trinidad using the McKinsey Organisational Capacity Assessment Tool (OCAT), adapted to evaluating public sector organisations. The adapted tool incorporated ten (10) diagnostic criteria, including leadership, funding, strategy and innovation. The assessment combined quantitative survey data with contextual analysis of local government’s statutory duties. The study identifies a general awareness of SDG 11.1 and some inherent alignments, but the capacity to localise the goal remains limited across most MCs. The findings show that building sustainable communities, especially by providing infrastructure and making sure everyone has equal access to basic services, needs a unified approach that includes leadership development, funding mechanisms, and coordination between different sectors.



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1157 - Policy Implications Of Boko Haram Insurgency On Urban Governance A Case Study Of Maiduguri Nigeria

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The Boko Haram (BH) insurgency, which originated in Maiduguri, has become one of Nigeria's most critical security challenges, disproportionately affecting the northeastern region. Its persistence has undermined urban governance, disrupted service delivery, and reshaped the socio-political landscape of Maiduguri. This study employed a mixed-methods design, combining structured questionnaires with semi-structured interviews conducted among local government officials, community leaders, and residents of Maiduguri. Complementary data on BH attacks from 2009 to 2024 were obtained from the Armed Conflict Location and Event Data Project (ACLED). Spatial analysis was applied to incident data, while quantitative responses were analysed with SPSS to identify patterns and correlations. Results revealed that the insurgent attacks are spatially clustered in densely populated areas with poor access to essential services and weak security infrastructure. Central Maiduguri recorded fewer incidents than peripheral settlements, indicating an urban–peri-urban divide. Temporal sequencing shows an escalation dynamic, where initial assaults in one locality often precipitate violence in adjacent neighbourhoods. Peaks in insurgent activity align with politically salient events (elections and military offensives). Seasonal variation revealed an increase in attacks during the dry season, suggesting that insurgents exploit mobility advantages. The insurgency significantly disrupts urban governance. Local authorities struggle to maintain law and order, deliver essential services, and safeguard public welfare. Resource diversion toward security-constrained developmental initiatives. Fear of violence reduces citizen participation in governance, weakening trust and eroding the social contract. Militarization of urban space through checkpoints, surveillance, and fortified public areas has altered the city's spatial character and diverted attention from long-term development priorities. Governance responses remain predominantly reactive, limiting the ability to address structural drivers of insecurity. The study recommends strengthening law enforcement and institutionalize data-driven decision-making; enhancing community participation and fostering socio-economic development; and cultivating partnerships with international organizations to build resilience and restore governance capacity in Maiduguri.



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1204 - Local Government In Portugal 1976 2026

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Na, Na, Lisbon-Portugal¹

1. Background. The overthrow of the long lasting (1926-1974) authoritarian political regime in April 1974 was followed by three main political changes during the transition period that led to the adoption of the first democratic Constitution in April 1976: the end of the colonial war in the former Portuguese colonies in Africa and the independence of these five new African states; the introduction of a multi-party-political democracy; and the start of the implementation in 1976, for the first time in the country, of a true system of local self-government, with a significant organizational, functional and financial autonomy.

2. Materials and methods. The paper provides a broad overview of the local government system in Portugal, fifty years after it was introduced, in the first democratic Constitution, approved in April 1976, discusses the challenges with which it is currently confronted, the recent reforms, and the prospects for the near future. Based on archival research, it explores, among other original sources, the legal frameworks related to local government adopted in the last fifty years, by central government and by the national parliament, political party proposals, public policy statistics, local elections results, and secondary and bibliographical sources as well.

3. Results & Conclusions. The evidence provided and the insights do show the existence of a coherent and comprehensive system of local (self-)government, 50 years after the first local election in December 1976. Nonetheless, the evidence also reveals the existence of holes in the system not yet filled, as is the case of the regional tier, as well significant institutional dimensions in which there is still ample room for expansion of local government competences and financial capacity.



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1208 - Industrial Legacies Green Transitions And Economic Diversification Regional Reorientation In A Changing Global Policy Landscape

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Background / Hypothesis

The Osaka–Kansai region has long developed as one of Japan’s core manufacturing centres for consumer electronics, electrical machinery, and related components. Dense supplier networks, skilled labour markets, and industrial infrastructure underpinned regional growth throughout the post-war period. Under globalisation, however, cost-oriented international expansion and the offshoring of production progressively hollowed out local manufacturing bases, weakening regional competitiveness and employment from the early 2000s. This paper hypothesises that recent industrial reorientation in Osaka–Kansai should be understood as a historically conditioned and uneven process shaped by earlier industrial choices, regional positioning within global production networks, and governance misalignments.

Materials and Methods

The analysis draws on historical accounts of regional industrial development, national and regional industrial and green policy documents, and regional economic statistics. These materials are used to trace long-term changes in industrial structure and to examine how shifts in global economic conditions and national policy frameworks have interacted with region-specific industrial legacies and institutional arrangements.

Results

The findings reveal three key dynamics. First, intensifying global competition strongly shaped regional trajectories during the early 2000s, when large-scale investments in flat-panel display technologies failed to generate sustained competitiveness amid rapid capacity expansion elsewhere. Second, subsequent national green and industrial policy initiatives were not consistently integrated with regional industrial strategies, limiting their effectiveness in supporting coherent industrial renewal. Third, the recent emergence of battery-related activities represents a partial and still uncertain reorientation, influenced by evolving demand and by the global re-emergence of industrial policy under conditions of economic security and supply-chain resilience.

Conclusions

The case demonstrates how national industrial strategies and resilience-oriented agendas are filtered through historically shaped regional structures, offering broader insights into the challenges faced by old industrial regions attempting to reposition themselves within changing global industrial landscapes.



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1215 - Local Spatial Governance As Strategic Discursive Intermediation Evidence From Local Practices In The Desakota Of The Pearl River Delta

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Over the past forty years of reform and regional development in Southern China, a distinct type of mixed urban–rural space has emerged, which have been shaped by the national dual land system and produced through the intertwined dynamics of top-down governmental initiatives and bottom-up actions of rural collectives. They are commonly conceptualized as Desakota, a term introduced by McGee (1991) to describe settlement patterns in rapidly urbanizing Asian regions.

To uncover the negotiations embedded in spatial governance in these areas, this research combining sociological and discursive institutionalist perspective, which embodies Giddens’s structuration theory, to build a “structural relations–specific episodes–discursive practices” analytical framework.

Firstly, a historical analysis of the evolution of spatial control and property-rights configurations is conducted, examining structural relations among agents, especially the power dynamics rooted in formal and informal property-rights regimes and authority structures. Secondly, systematic analysis is conducted in three case studies-ShiJie town, Lishui town and Liaobu town, to reveal how township-level governments respond to the top-down mandates through strategic discourse construction, embedding intentions and building action coalitions with local actors. The analysis employs participant observation and interview, focusing on how different actors and coalitions create, construct, and institutionalize these discursive formations in specific episodes, including planning making, negotiation, propaganda and meeting. Thirdly, local planning as strategic discursive intermediation are critically reconsidered, through which three distinct type of discursive–spatial nexus are identified - Alignment (Upward Formal Alignment), Reconfiguration (Discursive Meaning Reconstruction) , Decoupling(Symbolic–Material Decoupling)-each serving different context, performing specific function, yet embodying the targeted local intentions implicitly or explicitly.

By analyzing multi-actor interactions and discourse constructions process, the research reflects on how historicity, locality, discursive constructions and planning embedding vividly enact in local governance of the Desakota. Our findings extend the contribution of discursive–spatial nexus and the mediating role of local spatial governance, as well as the strategic ambiguity that characterizes China’s multi-level governance.



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1258 - Institutional Reconfiguration In A Global South Megacity The Case Of Bengaluru's Governance Reforms

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Background

Megacities in the Global South face mounting governance challenges arising from rapid spatial expansion, socio-economic inequality, and fragmented institutional arrangements. Since the liberalisation of the Indian economy in the early 1990s, Bengaluru has experienced accelerated population growth, spatial sprawl, and economic transformation, evolving from a laid-back garden city into a complex metropolitan region driven by the IT and services economy. Conventional single-tier municipal governance structures have proven increasingly inadequate for managing metropolitan-scale externalities, including transportation, infrastructure provision, environmental sustainability, and regional planning. The Greater Bengaluru Governance Act (GBGA) 2025 represents a significant effort to address these challenges through local governance reform. This paper hypothesises that while the Act seeks to enhance metropolitan coordination by introducing a centralised authority alongside multiple municipal corporations, it simultaneously generates tensions between strategic integration and democratic decentralisation.

Methods

The study employs a qualitative policy analysis of the GBGA 2025, drawing on legislative texts, government notifications, and secondary literature on metropolitan governance in the Global South. This is complemented by a comparative analytical framework that engages with international experiences from megacity regions, such as São Paulo, Johannesburg, and Jakarta. The analysis focuses on institutional design, allocation of powers, fiscal and administrative implications, and alignment with constitutional principles of urban decentralisation.

Results

The findings indicate that the GBGA introduces a hybrid governance model combining decentralised local service delivery with centralised metropolitan coordination. While the creation of smaller municipal corporations has the potential to enhance administrative responsiveness and local accountability, the concentration of strategic planning and coordination powers within a state-led metropolitan authority risks diluting local autonomy. The Act prioritises efficiency, infrastructure integration, and policy coherence, but provides limited mechanisms to institutionalise citizen participation and bottom-up decision-making.

Conclusions

The Bengaluru case illustrates a broader trend in Global South megacities where governance reforms privilege coordination and scale efficiencies over deepened local democracy. The paper concludes that effective megacity governance requires institutional arrangements that balance metropolitan-wide integration with empowered local governments, rather than framing centralisation and decentralisation as opposing choices. These insights are relevant for ongoing urban governance reforms across rapidly urbanising regions of the Global South.



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1372 - Re Ordering The Hydraulic Landscape The Socio Technical Transformation And Agrarian Negotiation In Taiwan's Jianan Irrigation System

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¹

This study investigates the socio-technical transformation of the Jianan Irrigation System—Taiwan's largest colonial-era hydraulic infrastructure—following the 2020 institutional reform that centralized local Irrigation Associations into a state agency. While state narratives frame this reform as a technical optimization for water security amidst global climate uncertainties and shifting national economic priorities, this study argues that the hydraulic landscape has become a contested site of “ordering.”

Drawing on Science and Technology Studies (STS) and the concept of “ordering instruments,” this study analyze three critical dimensions: (1) Institutional Ordering: the centralization of water management and its impact on technical distribution standards; (2) Agrarian Ordering: the use of fallow subsidies and cropping regulations as tools to discipline farming practices; and (3) Symbolic Ordering: the construction of a sanitized historical memory through heritage-making projects.

Based on 53 in-depth interviews and field observations conducted between 2023 and 2024, the findings reveal a significant tension between the state's “formal order” and farmers' “informal practices.” The study demonstrates that farmers do not passively comply with state-led ordering; instead, through tactics such as private well-drilling and the strategic manipulation of cropping patterns, they co-produce a hybrid landscape that challenges the state's technocratic imaginary. By highlighting the interplay of state power, material constraints, and local agency, this study contributes to the global discourse on the political ecology of infrastructure in post-colonial contexts.



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1444 - Governing Regional Industrial Policy Through Intermediary Organization Ecosystem Central-local Relations In Chuncheon's Bio Industry South Korea

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Background and Hypothesis

This study aims to investigate the evolutionary process of the intermediary organization ecosystem in the context of regional industrial policy, with a focus on the bio-industry in Chuncheon, South Korea. In South Korea, regional industrial policy has largely been implemented through intermediary organizations jointly established and/or funded by central and local governments. Although these organizations have supported early industrial growth, their long-term implications for governance have not been thoroughly investigated. This study hypothesizes that the government-led intermediary organization ecosystem initially strengthened local industrial capacity but has, in the long run, generated institutional rigidity and re-centralization tendencies that limit effective local governance.

Materials and Methods

This research adopts a qualitative case study approach, focusing on Chuncheon City's bio-industry as an illustrative example of local industrial policy in a non-metropolitan context. The analysis incorporates policy documents, organizational reports, statistical data, and semi-structured interviews with local government officials, intermediary organization managers, and industry representatives. By examining how central-local relations, organizational roles, and governance practices have changed over time, this study employs an institutional evolutionary framework.

Results

The findings indicate that Chuncheon's bio-industry initially benefited from a dense network of intermediary organizations that facilitated coordination among central and local governments, firms, and policy-related actors. However, as central government oversight increased through competitive funding mechanisms and performance-based evaluation systems, intermediary organizations became more isomorphic in structure and function. This institutional isomorphism resulted in functional overlap, administrative competition, and increased reliance on central government projects. As a result, local governments' strategic autonomy and firms' capacity for place-specific innovation declined.

Conclusions

The results suggest that the limitations of Chuncheon's intermediary organization ecosystem originate from governance structures rooted in the developmental-state model, rather than from shortcomings in local management. To improve local and urban governance of regional economies, policy reforms should prioritize clearer role differentiation, reduced central control, and greater strategic autonomy for local governments and intermediary organizations. This study advances discussions on local governance, re-centralization, and institutional innovation in regional development policy.



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1461 - Strategy For Urban Biodiversity – The Central European Approach Within The Urbio Bauhaus Project

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In the face of growing environmental crises, cities are becoming important areas for innovative solutions for sustainable development, including efforts to increase biodiversity in urban areas. Implementing changes in this area requires strategic management instruments. These tools allow for a systemic approach to the issue, treating it not as a separate component, but as an integrated element of a broader policy for shaping the space of our cities. Given that the New European Bauhaus (NEB) is the current approach to urban development in Europe, we propose integrating environmental issues as an integral part of this urban paradigm. Based on pilot studies conducted in four cities across Central Europe, we draw conclusions and formulate recommendations on how to effectively implement urban actions while simultaneously enhancing urban biodiversity. One of the outcomes of the URBIO BAUHAUS project, co-financed by the Interreg CE program, is the “CE Strategy for NEB-based Urban Biodiverse Transition”. The main goal of this document is to transform urban areas towards enhanced biodiversity. During the strategy development process, the experiences of the four URBIO BAUHAUS project partner cities were analyzed, allowing for the identification of local barriers and best practices for implementing solutions aimed at increasing biodiversity in cities, using the NEB approach. This approach allows for increased acceptance of nature in cities by combining the three NEB pillars (aesthetics, sustainability, and social participation) with biodiversity, addressing the needs of users while simultaneously supporting natural urban ecosystems. The developed strategy aims to enhance biodiversity in the partner cities, while also serving as a universal model for other urban areas in Europe and beyond. By promoting nature-based solutions and participatory governance, the project points the way to a regenerative future for cities, where civilizational development coexists in harmony with the biosphere.



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1576 - Role Of Local Government In The Development Of Actor Networks Of Agri Food Involved In Short Supply Chains Comparative Analysis Between Marseille (france) And San José (costa Rica)

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As in many countries, the Green Revolution of the 1950s completely changed the agricultural landscapes of France and Costa Rica, transforming small-scale farming into intensive, mechanized, and regionalized production mainly intended for export. This led to a disconnect between urban consumers and farmers, motivating citizens to reclaim control over their consumption habits and create short supply chain outlets in order to get closer to their food. While France and Costa Rica have national laws on agri-food issues, local governments in both countries have few skills on this subject. However, in recent years, the local governments of Marseille and San José have taken up this issue and developed direct sales schemes based on the same model as those initiated by citizens several decades ago. There is a circulation of models between an innovative but isolated civil society, ambitious state prerogatives with limited resources, and local authorities that are implementing actions.

At the same time, urban municipalities are grouped together in metropolitan areas, but the situations are very different in our two case studies: the Métropole Aix-Marseille-Provence has recently become a driving force on these issues, while the Gran Area Metropolitana de San José has neither a government nor a representative.

Based on these two examples, we will examine how local government fit into the network of actors involved in the development of short food supply chains.

This work is based on several months of observations in Marseille and San José, which led to the completion of around 100 semi-structured interviews with actors involved in territorial food governance and the analysis of grey literature.

The resulting timeline of short supply chains in these two cities shows the innovation undertaken by civil society to meet hyper-local needs (usually neighbourhood scale), followed by the institutionalization of these mechanisms by local government. Analysis of the networks of actors shows that local authorities play a central role in France, whereas national and non-governmental institutions are more prominent in Costa Rica. While the types of sales are relatively similar in these two territories, the political arenas of these two municipality have different relationships between actors and distinct centralities.



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1676 - Urban Geographical Perspectives On The Diffusion Of New Energy Vehicles In Shanghai China

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Background / Hypothesis:

This presentation examines the diffusion of new energy vehicles (NEVs) in Shanghai, focusing on how urban socio-spatial and institutional contexts shape adoption patterns. Drawing on an actor-oriented perspective, the study examines interactions among policymakers, automakers, users, and other societal factors.

This study hypothesizes that the high level of NEV adoption in Shanghai is driven less by environmental awareness than by institutional constraints related to urban structure.

Materials and Methods:

This study draws on in-depth interviews with users (private vehicle owners), dealers, and professional drivers, combined with a systematic analysis of policy texts, subsidy systems, and relevant media reports, together with spatial analysis techniques.

Results:

Initial adoption of new energy vehicles in Shanghai was driven mainly by license plate regulations that tightly control urban access, rather than environmental awareness. Many users, especially ride-hailing drivers and households unable to obtain gasoline vehicle licenses choose new energy vehicle to avoid high entry barriers and gain unrestricted urban access. At the same time, the high economic value of gasoline vehicle licenses created a lock-in effect, discouraging some owners from switching.

Adoption is also spatially uneven. Residents in high-density older neighborhoods without dedicated parking face major barriers to installing charging infrastructure. Beyond these constraints, continued use of new energy vehicles fosters embodied driving habits and perceived reductions in exhaust odors in parking facilities, making a return to gasoline vehicles increasingly unlikely.

Conclusions:

The diffusion of NEVs in Shanghai results from the combined effects of policy constraints, economic incentives, residential spatial conditions, and embodied driving experiences. Adoption initially arises from institutional and cost pressures and becomes stabilized through changes in everyday driving practices. This suggests that NEV diffusion in Shanghai is shaped by the interplay of urban governance, spatial inequality, and mobility practices, rather than by policy or individual preferences alone.



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1687 - From (re)centralization To (non)service Providing Local Governments. Or The Failure Of The Neo Weberian State In Hungary

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In my presentation, I examine the recentralization of Hungarian local government under the Orbán regime since 2010. During the regime change, Hungary adopted a very liberal - not ideologically liberal - law on local government compared to other countries in the region. This is illustrated by the fact that after the change of regime, local governments, regardless of governments, were widely trusted by the population. In 2010, Hungary broke with the democratic values of the local government system adopted in 1990 and implemented a profound local government reform in the spirit of a neo-Weberian concept. In line with this ideological basis, it transformed the local government sector, encompassing the electoral system, local government services, and the financing system. In my presentation, I will outline the main stages of this process and the consequences of the measures taken. It has become clear that the system has not implemented a neo-Weberian concept but has created a “top-heavy” state that is unable to safely organise and provide the services it has undertaken to deliver. Drawing on legislative changes, policy documents, and secondary literature, the study shows how illiberal regimes in Hungary use seemingly technocratic reforms to undermine pluralism and strengthen authoritarian centralisation. Using data from two public opinion polls (2018 and 2023), I present the population’s perceptions of access to local public services. I use the data to answer the central question of how the government’s reduction of local autonomy affects voters’ trust in local governments and public services.



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1700 - Top Down Regionalization In Defining Emergency Areas Emerging Challenges And Evidence From Italy

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Territorial policies in many European countries have often undergone a transition toward bottom-up models, with an increasingly prominent role played by local authorities in their planning. Nevertheless, there are still policy areas in which decision-making is established at a centralized level, with consequences for the local contexts they affect. This is the case of the definition of emergency areas in Italy. When an emergency event occurs (such as an earthquake or a volcanic eruption), it is the State that defines which areas are to be considered affected. In delineating these areas, the State consistently adopts an administratively based regionalization that mirrors municipal, provincial, or regional administrative boundaries, even when these do not exactly coincide with the actually affected area. Such a model of definition may generate a range of negative impacts on the territories involved, including: inequalities in the geographical distribution of aid; the exclusion of certain local authorities from emergency governance processes; landscape impacts of support interventions that are detached from the local context; and inaccurate media communication regarding the areas that have been effectively affected. This contribution is based on a review of Italian case studies, supported by images and cartographic materials, for which on-field semi-structured interviews were conducted with local institutional actors. The aim is to provide insights into how a top-down administrative “trap” in the definition and governance of emergencies in territories affected by natural events might be overcome.



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1930 - Models Of Co Operation Between Corporations And Local Governments In Russia For Sustainable And Inclusive Development

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The traditional model of business-government relations, which has long been based on informal agreements, lobbying for preferences or targeted charity, demonstrates its limitations, and a transition to an institutionalized strategic partnership. In the contemporary Russia, it needs that corporate strategies must be directly linked to the National Development Goals until 2030 and to local and regional programs.

The purpose of the research is to develop a typology of models of interaction between corporations and local governments, as well as to identify mechanisms that enhance the sustainable and inclusive development of territories.

The research is based on key theoretical contributions. J.Galbraith showed the conditionality of the boundaries between the state and corporate spheres. A.Tocqueville substantiated the need for collective action and the role of associations in coordinating public interests. E.Freeman laid the foundations of the theory of stakeholders, which J.Post, L.Preston and S.Sachs developed the organizational wealth concept.

We conducted six models of interaction between corporations and local governments in Russia including monopoly partnership, joint project management, pluralistic interaction, temporary projects, conflict confrontation, and passive disregard. In any case, sustainable development is possible only with the transition to a strategic partnership of government, business and the local community.

There is also a case of moving the headquarters of corporations from Moscow to the regions. Such idea has been discussed in Russia since 2013. Only several companies have relocated or announced plans to move headquarters, e.g. VTB Bank and Gazprom (the main natural gas producer) re-registered in the city of St. Petersburg, boosting city revenues. Among private firms, En+ Group announced a move to Irkutsk, RUSAL opened a management office in Krasnoyarsk in 2021.

In 2024, the President instructed the Government to prepare specific proposals for relocating headquarters of state-owned corporations to the regions. RusHydro (the electricity producer) is set to relocate to city of Krasnoyarsk its key assets, acquiring office space and housing for employees, though this will entail regional budget expenditures. These cases show that formal re-registration often does not equate to full operational relocation.

The research was supported by the Russian Science Foundation, grant No. 25-18-00709 (<https://rscf.ru/en/project/25-18-00709/>).



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2066 - The Capital Of The Blue Amazon In The Decade Of The Ocean Innovations In Local Governance In The City Of São Salvador (bahia)

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The Decade of Ocean Science for Sustainable Development (2021-2030), the Ocean Decade, is a United Nations (UN) initiative proclaimed to reverse ocean decline, boost marine science, and integrate scientific knowledge into public policies, aiming to achieve the Sustainable Development Goals (SDGs) by 2030, focusing on protection, restoration, combating pollution, and sustainable use of ocean ecosystems. The Blue Amazon is the name given by the Brazilian Navy to a vast maritime area of 5.7 million km² under national jurisdiction, comparable to the Green Amazon in size and importance, rich in biodiversity, natural resources, and vital for foreign trade and sustainability, representing a strategic asset for the country's economy, science, and sovereignty. The City of Salvador, in the state of Bahia, is considered the capital of the Blue Amazon, due to its strategic nautical location, situated on a stretch of land between the waters of Todos os Santos Bay and the western coastal strip of the South Atlantic. Currently, initiatives of the local government – the city hall – through the actions of its secretariats, are focused on coordinating actions that include the participation of the private sector and civil society, in addition to the city hall itself. This coordination characterizes a socio-political context of local governance strongly associated with Salvador's urban policy. A questão central que norteia nossa reflexão é o desafio da inovação na governança da Cidade de São Salvador, considerando a década de vigência do Salvador Urban Development Master Plan (PDDU/2016). Our objective is to critically reflect on the innovative actions of this socio-political coordination in the City of São Salvador, aiming to clarify the confrontation of the challenges of local governance in the Ocean Decade. Specifically, we will consider i) the proposal to create a Public Marina, within the scope of the Municipal Secretariat of the Sea; ii) the project of the Municipal Secretariat of Social Assistance for the inclusion of poor youth in the leisure activities of the Yacht Club of Bahia; and iii) the inclusion of the theme of Ocean Culture in the school curriculum, as an initiative of the Municipal Secretariat of Education.



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2156 - The Interaction Between Technology Participants And Places In Civic Tech Activities

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Background and Purpose:

Civic tech refers to activities where citizens themselves aim to solve local issues by utilizing open data and information and communication technology to provide new services and tools for fellow citizens. Our research takes Code for Kakegawa, a civic tech brigade in Japan, as a case study. Focusing specifically on activities using spatial data, we aim to clarify the processes by which technology, participants, and gathering places function together to develop civic tech activities.

Methods:

Through document examination and interview survey, we organize the information of Code for Kakegawa's projects. Taking projects using 3D point cloud data as case studies, we diagram the process from the perspectives of technology, participants, and gathering places to capture its characteristics.

Conclusion:

Our major findings are as follows: 1. Continuity of their activities is achieved through transfer and adaptation of techniques. In a series of projects utilizing 3D point cloud data, techniques were passed down and developed incrementally. This indicates an accumulative activity pattern where techniques acquired in one project are utilized in the next. 2. Several types of in-person/online gathering places generate and develop the projects. Regular meetings, Open Data Days, and events serve functions such as idea generation, information sharing, creation, presentation, and learning. 3. Participants generate and develop the projects with multiple skills and roles. A single participant can contribute flexibly to Code for Kakegawa's activities by changing roles — for example, participating in one project as a Code for Kakegawa member and in another as an external collaborator with professional expertise. Our presentation will show more details of the case and its analysis.

Acknowledgement:

This work was supported by JSPS KAKENHI Grant Number 23K04082.



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2174 - Challenges And Problematic In Managing The Palestinian Public Space In Jerusalem

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This paper aims to present, analyze and criticize how the Palestinian public space and space is usurped and Israel dominates it. This interweaving is practiced by means of an intelligent matrix of control that uses hard tangible compounds, and soft spiritual ones, in order to change the character and scene of the city. This systematic assimilation emanates from religious, ideological and geopolitical references, using the power of the municipality and the states to impose and establish its agenda to transgress and Judaize the city. The vehicles of the matrix of control are completed by keeping the Palestinian Jerusalemites in the temporary state; they struggle to survive and suffer from being neutralized from production of public space and the application of their right in the city.

This paper claims that the distortion of the tangible physical public space and the intangible moral public space is done through the lack and absence of open civil public spaces in East Jerusalem, and the prevention and displacement of cultural and public activities and events to create a state of alienation between the Palestinian and his place, preventing him from exercising his natural right to city.

This paper adds an additional cognitive dimension to the conflict over the public space in Jerusalem, to understand the relationship between the social and spatial transformations and the hierarchy of functional spaces in the city's surroundings, through a critical reading,

We also try through the paper to present the dialectic of the conflict in the public space as an expression of the conflict over the narrative and the imposition of an atmosphere and the identity of the city to increase the suffering of the Palestinians in Jerusalem.



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2225 - The Governance Of Urban Public Space In Dublin Street Performance As A Lens For Understanding

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Background

As urbanisation accelerates, cities face mounting challenges in the governance of public space, with the nature, quality and accessibility of public space under increasing pressure. These challenges are particularly acute in neoliberal contexts, where privatisation and commodification reshape access and control, rendering public space more contested. Street performance occupies a distinctive position within these dynamics: as an informal activity that takes place in public space, it is increasingly subject to regulation, surveillance and administrative intervention. Therefore, examining street performance offers a valuable lens through which to explore broader questions of public space governance, participation and everyday urban management. Focusing on Dublin, an international city characterised by growing diversity as well as persistent inequalities, this paper situates street performance within evolving policy, regulatory and institutional frameworks shaping contemporary public space.

Materials and Methods

The study adopts a qualitative, governance-oriented approach combining policy and document analysis, semi-structured interviews, and analysis of administrative records. Key materials include the Street Performers Bye-Laws 2016, related legislation, cultural policy documents, and datasets on permit applications, inspections, complaints and warning notices provided by Dublin City Council. Data are analysed thematically using NVivo, with attention to governance rationales, regulatory interpretation, and everyday enforcement.

Results

The paper examines how street performance is governed in practice in Dublin, focusing on the interaction between regulatory frameworks, institutional responsibilities and everyday enforcement. It explores the role of complaints, inspections and discretionary decision-making in shaping regulatory responses, and considers how multiple policy frameworks and institutional arrangements structure everyday practices of administration and control. Additionally, attention is also given to the ways in which governance is negotiated and interpreted in specific situations and locations.

Conclusions

By examining street performance as a situated and everyday practice, the paper contributes to wider debates on the governance of urban public space. It highlights how informal cultural activities are shaped by regulatory logics, institutional arrangements and administrative practices, and demonstrates the value of street performance as a lens for understanding the tensions between creativity, control and participation in contemporary cities.



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2236 - Administrative Functional Mismatch In China Identification Mechanisms And Measurement Methods With Watershed Governance As An Illustrative Case

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Administrative–functional decoupling is a common challenge in regional governance. In China, administrative regions define the formal units for policy design, budgeting, and accountability, while many functional regions are formed by real-world interactions such as mobility, economic linkages, and environmental processes. Because functional regions often span multiple jurisdictions, their spatial extent rarely matches administrative boundaries. This mismatch can increase coordination costs and lead to fragmented policy responses, especially when neighboring jurisdictions differ in regulatory standards, fiscal capacity, performance evaluation targets, and intergovernmental collaboration arrangements.

This study develops an integrated framework to support the identification–measurement–mechanism interpretation of administrative–functional decoupling. First, functional regions and their key linkages are identified using multi-source data that capture flows and spatial processes (e.g., connectivity, interaction intensity, and process continuity). Second, we overlay functional regions with administrative units to construct a mapping matrix that represents how functional units are distributed across jurisdictions. Local decoupling coefficients are then defined based on measurable features such as boundary-induced fragmentation, connectivity loss, or cross-border impedance. To summarize system-level mismatch, we propose an overall decoupling index as a weighted aggregation of local decoupling intensities, where weights reflect functional importance (e.g., overlap area or functional intensity). Third, the framework enables nationwide assessment across China to locate decoupling “hotspots” and to connect decoupling patterns with governance outcomes.

Watershed governance is used as an illustrative case to demonstrate the practical meaning of decoupling. River basins are process-based functional units shaped by upstream–downstream transmission, yet governance is typically organized by jurisdiction. When administrative boundaries cut across basin processes, responsibility allocation and policy actions may not align with pollution pathways, increasing the risk of externality shifting and fragmented coordination, and ultimately weakening water-quality improvement. The proposed approach provides a transparent, reusable measurement toolkit for diagnosing administrative–functional mismatch and informing cross-jurisdictional coordination in China.



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2255 - Technological And Political Interventions From Above Comparing Solid Waste Governance In Urban Kerala And Telangana

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The urban solid waste sector in India is increasingly being reframed as a site of opportunity through flagship initiatives led by national and state governments, particularly under the Swachh Bharat Mission-Urban. Technological interventions are positioned as central to transforming the urban waste management sector from a crisis prone sector into one oriented toward energy recovery, wealth generation, and job creation, as reflected in the Solid Waste Management Rules, 2016. These interventions have introduced new corporate, political, and social actors into the sector, bringing with them diverse and often competing interests. In practice, technology centric approaches pose significant governance challenges for urban local bodies, which are frequently embroiled in controversies. This paper examines waste governance practices in two contrasting contexts, urban Telangana and Kerala. In Telangana, five new Waste-to-Energy (WtE) incineration facilities are being developed around Hyderabad, in addition to the Jawaharnagar WtE plant, through collaborations between the Greater Hyderabad Municipal Corporation and private actors. In contrast, Kerala's discourse largely frames WtE incineration as unfeasible, leading to a policy shift toward a recycling based economy and scientific landfilling, driven by the Clean Kerala Company and the Kerala Solid Waste Management Project in partnership with the World Bank and the Asian Infrastructure Investment Bank. While these technological interventions are actively pursued, the processes through which they are negotiated, implemented, and contested, along with their social and political consequences, have received limited scholarly attention. This paper addresses this gap by examining, first, how techno-political imaginaries of urban solid waste management aimed at transforming waste crises into 'opportunities' are negotiated at the municipal level.



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2270 - Territorial Data Governance Limitations Of A Sequential Approach. The Case Of Datalab Normandie

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French local authorities have no legal jurisdiction over public data policy, even though French public reports and European legislation emphasize the role of data as a decisive element in territorial development and security (Cattaruzza, 2019). In this context, partnership-based mechanisms for data valorization have emerged at the regional level since 2019, such as DataLab Normandie.

This paper examines the development of this territorial engineering (Lardon et al., 2007) of data, which involves coordinating heterogeneous actors with varying operational frameworks and levels of data maturity. The hypothesis posits that this scaling up of territorial expertise requires progressive collective learning processes that reshape the modalities of territorial governance (Leloup et al., 2005) of data.

This research employs a qualitative methodology focused on DataLab Normandie, implemented as a consortium from 2020 to 2023, and its members (local authorities, enterprises, higher education and research institutions, etc.). The methodology combines in situ observation (2020-2023), semi-structured interviews with members, and comparative analysis with three similar mechanisms (DataGrandEst, Climate Data Hub, and Ekitia).

The analysis reveals a three-phase development of these mechanisms: launch; prefiguration and materialization; adjustment and transition. While this sequential approach is justified in a context of uncertainty, it reveals its limitations during phase transitions, particularly when the governance model is flexible, as in the case of DataLab Normandie. Indeed, these transitions require adjustments that elicit either commitment or disengagement from actors. In this respect, while flexibility in governance proves necessary to secure actors' commitment to the initial collective approach, it constitutes an obstacle to its long-term consolidation. Consequently, local authorities have a role to play (facilitator, trusted third party, partner, etc.) in supporting this collective learning process.

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2548 - Institutionalising Interscalar Cooperation Suburban Railway Services In The Reconfiguration Of French Public Action

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This article analyses how the emergence of Suburban Railway Services known in France as Services Express Régionaux Métropolitains (SERM in French) reshapes the governance of mobility and the distribution of power between levels of government. The 2023 SERM law marks an unprecedented attempt to institutionalise interscalar cooperation between regions and metropolitan authorities in a context characterised by long standing regional control over rail transport and the growing political and technical capacity of metropolitan governments. Drawing on a comparative qualitative analysis of multiple French metropolitan regions and informed by European references the article shows that SERM projects largely precede national reform and are primarily driven by local actors seeking to adapt rail services to metropolitan mobility needs. The implementation of these services reveals strong tensions between regional planning logics and metropolitan service oriented approaches as well as persistent constraints linked to financing institutional fragmentation and the absence of a dedicated normative framework. The article identifies three emerging governance configurations based on contractual arrangements mixed cooperative structures and more integrated voluntary models highlighting the asymmetrical and incremental nature of institutional change. It argues that SERM function as a laboratory for the progressive institutionalisation of interscalar and interlocal governance without formal transfers of competences revealing a broader transformation of French public action in the field of mobility driven largely from the bottom up.



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2726 - Transformation Of The Local Governance System In Ukraine Trends Challenges Innovations And War

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Modern system of Local Governance in Ukraine was formed according to the long-term national experience, putting into account best practice of other countries, international requirements. Generally, power of people in Ukraine is exercised by direct democracy tools - Elections and Referendums at national, regional and local levels, and through state authorities at national, regional, local levels, by local self-government bodies as well. According to Constitution of Ukraine local self-government is a right of the territorial community to resolve independently issues of local importance. A lot was done in this sphere since 1991, after reaching of full independence. All reforms were based on ensuring the observance of the rights and interests of citizens, optimizing of the governance on the base of subsidiarity, sustainability principles, by decentralization of power for more effective balancing of public and private interests at national, regional and local levels, for better using of existing natural, human, financial and other resources, proper implementation of international obligations, including according to the Association Agreement of Ukraine-European Union. Administrative reform has been carried out, relevant authorities were formed, special laws and other legal acts were adopted. Russian aggression and full scale war against Ukraine since 24 February 2022 caused substantial changes. Immediately, on the whole territory of Ukraine according to Constitution special legal regime - martial law has been imposed by President's Decree, which was approved by Parliament. Civil state administrations were transformed into military administrations. In such situation all their functions, resources and actions at the central, regional and local level are concentrated for the military aims but in the same time – for the better protection and saving of civil citizens, for increasing of national economic activity. We hope that Ukrainian experience in such sphere, concrete our innovation will be useful for other countries, for further geographical, legal and other researches. In case of great scale of war damages and aims of future renovation, including by “Ukraine Facility” Program, become more and more important relevant multidisciplinary cooperation, substantial changes in legal regulation and relevant geographical support for further sustainable development of the countries and territories, damaged



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2727 - Using Residential Parking Standards To Support Shared Mobility Integration In Housing Developments A Comparative European Analysis

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Background and Hypothesis

Residential parking regulations play a key role in shaping urban mobility patterns and housing development outcomes. However, comparative knowledge of how different regulatory approaches support sustainable mobility transitions remains limited. This research examines the hypothesis that residential parking standards operate along a spectrum ranging from prescriptive regulatory frameworks to flexible and adaptive systems, each offering distinct advantages and trade-offs for integrating shared mobility services into housing developments.

Materials and Methods

This study covers the parking standards of seven European cities within the SHARE-North Squared Interreg project: Bremen (Germany), Mechelen (Belgium), Utrecht (Netherlands), Aarhus (Denmark), Stavanger/Bergen (Norway), and Helsingborg (Sweden). Data collection involved the review of EU directives, national policies, municipal bylaws, and local planning documents. The comparative framework examines five dimensions: (1) zoning frameworks and spatial differentiation; (2) parking provisions; (3) shared mobility integration and replacement ratios; (4) financial compensation mechanisms; and (5) communication strategies and stakeholder engagement approaches.

Results

Results reveal diverse regulatory approaches, ranging from normative and prescriptive systems to more permissive, flexibility-based models, alongside a general convergence from traditional minimum/maximum requirements toward integrated mobility management frameworks. Common features include zone-based standards with increasingly restrictive parking requirements in central areas, mandatory or incentivized carsharing integration with varying replacement ratios, and financial compensation schemes for reduced parking supply, typically ranging from €5,000 to €30,000 per missing space. Most cities in the north sea region apply strong bicycle parking standards, in line with recent EU-level requirements.

Conclusions

The findings and the first feedbacks suggest that residential parking standards can effectively support sustainable mobility transitions when embedded within comprehensive regulatory frameworks combining supply-side restrictions, shared mobility infrastructure requirements, tax incentives, and financial mechanisms supporting alternatives. The observed variability reflects differing governance contexts and implementation capacities. Future research should assess mid-term impacts on car ownership, housing costs, and sustainable mobility uptake in pilot housing developments across the SN² project partner cities.



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C24.16-Geography of Digital Society and Connected World => Airports as Hubs of the Digital Society: Interactions Between Space, Technology and Mobility



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1312 - Not Such Smart Airport! The Airport Of Catania Between Digitalisation And Privatisation

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Our contribution analyses the case of the international airport of Catania, the first in Southern Italy in terms of traffic, with the intent to illustrate the peculiarities and the contradictions of the relation between austerity and digital urbanism in a gateway city of southern Europe.

After providing an history of the airport and discussing its key role for urban and regional development during last decades, the article illustrates the main discursive representations, material projects and political tensions accompanying the most recent processes of transformation of the airport – mostly oriented to land expansion, digitalisation and privatisation.

Two main perspectives emerge by means of a critical analysis of archival documents, institutional reports, press and interviews with a number of key actors.

On the one hand, during a period when the airport authority SAC (Società Aeroporto di Catania), a predominantly public company, has to respond to growing criticisms regarding operational, organizational and governance issues, digitalisation has become a first technical instrument of innovation in order to accelerate the transition towards a more efficient, competitive and sustainable model of international airport. While an ambitious Master Plan has been launched in 2024, outlining a development project which foresees an investment of €600M useful to transform the airport and the city in a Mediterranean hub of transport, logistics and tourism (Master Plan 2030), privatisation is indicated as the solution for further modernisation and digitalisation of the infrastructure and for achieving the Plan's objectives.

On the other hand, from a critical posture, digitalisation and privatisation are instead interpreted as instruments of austerity and neoliberal urbanism which reconfigure the relation between the urban, the digital and the capital in a way which could expose the city and its inhabitants to the risks associated with an increasing urban infrastructural privatisation and financialization, including urban sprawl, land speculation and uneven spatial development.



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1605 - Invisible Infrastructures Of Free Route Airspace And The Digital Transformation Of Airports.

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The implementation of Free Route Airspace within the Single European Sky represents a paradigmatic transformation in the governance of air mobility. While commonly described as a technical optimisation of air traffic management, this contribution advances the hypothesis that Free Route Airspace constitutes an invisible yet decisive spatial reconfiguration that reshapes airports as socio-technical hubs of the digital society. Rather than producing visible infrastructural change, this transformation operates through digital systems, procedural logics and human practices, contributing to the production of airport space through code, data and knowledge.

The study adopts a qualitative and interpretative methodological approach. It is based on the analysis of institutional and technical documentation produced by Eurocontrol, the Single European Sky Air Traffic Management Research programme and European Air Navigation Service Providers. These materials are examined through a geographical framework informed by transport geography, digital geographies and the mobility turn, allowing for an interpretation of Free Route Airspace as both a governance mechanism and a spatial practice operating across multiple scales.

The analysis shows that Free Route Airspace reconfigures air-ground relations by enabling flexible, user-defined trajectories that increase traffic variability and operational complexity. Airports emerge as dynamically orchestrated environments embedded within digitally integrated networks, where spatial organisation is shaped by real-time data flows rather than fixed physical layouts. A central finding concerns the role of air traffic controller training, which functions as an immaterial yet strategic infrastructure. Training programmes, simulations and procedural adaptations are essential for stabilising highly fluid operational environments, particularly in cross-border contexts requiring enhanced coordination.

Although Free Route Airspace leaves no tangible imprint on terminals or runways, it actively produces new forms of operational space, governance and professional practice. By foregrounding human adaptation and knowledge infrastructures, the paper contributes to debates on airports as hubs of the digital society, highlighting how invisible processes of code, mobility and training generate contemporary airport geographies.



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1956 - Airports As Digital Socio Technical Hubs Spatial Reconfigurations Data Infrastructures And Multiscalar Mobilities

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In recent decades, airports have undergone a profound transformation, evolving from transport infrastructures into complex socio-technical hubs embedded within the digital society. This paper critically explores how processes of digitisation, data-driven governance, and smart technologies are reshaping airports' spatial configurations, functional roles, and mobility dynamics across multiple scales.

Building on a geographical and interdisciplinary framework, the contribution conceptualizes airports as hybrid environments where mobility systems, digital infrastructures, and urban logics intersect. Drawing on theories of air mobility, network analysis, and smart urbanism, the paper examines airports not only as nodes within global transport networks but also as emerging “urban platforms” for digital experimentation, real-time control, and personalized mobility experiences.

Methodologically, the research integrates qualitative and quantitative approaches, including spatial analysis, network-based representations of air transport systems, and critical interpretations of airport spaces as lived, worked, and governed environments. Particular attention is given to the role of digital technologies—such as IoT-based monitoring, AI-assisted operations, biometric systems, and data platforms—in redefining airport governance, spatial organization, and user experience. These processes contribute to the re-scaling of airports' influence, from local and regional contexts to transnational and global networks, reinforcing their role as strategic connectors within contemporary mobility ecosystems.

The paper argues that airports increasingly resemble “smart cities in miniature”, yet with specific characteristics linked to security regimes, temporal intensity, and infrastructural complexity. At the same time, this transformation raises critical questions concerning spatial justice, accessibility, surveillance, and the human dimension of digitally mediated mobility. By framing airports as key laboratories of digital urbanism, the contribution seeks to advance an interdisciplinary dialogue between geography, urban planning, transport studies, and digital innovation, offering new insights into the evolving relationship between space, technology, and mobility in the age of the digital society.



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2695 - User Feedback On Teleconsultation Cabins In France

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This paper examines feedback from users of teleconsultation cabins in France, the deployment of which accelerated from 2020 onwards. There are now more than 7,000 cabins nationwide. However, recent studies show that these areas do not primarily benefit from this expansion, which instead mainly concerns territories that are already well or relatively well endowed (Vidal & Rezanova, 2025).

In addition to a diffusionist approach based on spatial analysis of deployment, this study draws on the results of a nationwide survey of over 400 patients who have used these devices. The survey relied on self-administered questionnaires completed by patients inside the cabins during the waiting time before a remote consultation with a physician. This protocol enables detailed information to be collected on users' profiles, practices, motivations and conditions of access to the cabins, while ensuring the anonymity of respondents.

One of the most notable findings is the increased rate of repeated use, suggesting that certain groups are gradually appropriating these devices. Analysis of the mobilities associated with cabin use reveals different patterns depending on the type of space. In intermediate areas (DEGURBA 2), users mostly come from surrounding municipalities which often have poor healthcare provision. In these contexts, reliance on the automobile appears to be essential for gaining rapid access to a consultation. Conversely, in metropolitan environments (DEGURBA 1), users mostly live nearby and primarily travel to the cabins on foot.

These results demonstrate that the adoption of teleconsultation cabins is part of a normalisation process embedded within healthcare access strategies that are guided by patients' capacity — and sometimes willingness — to accept or reject the waiting times imposed by conventional medical appointments. These uses are not merely a constrained option; they reflect deliberate trade-offs between care timeframes, mobility resources, and modes of access to healthcare professionals.

Reference:

P. Vidal & A. Rezanova (2025). 'Teleconsultation cabins: a response to France's healthcare access crisis?', *Geojournal*, <https://doi.org/10.1007/s10708-025-11345-1>



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3209 - The Naples Salerno Axis Territorial Impact Functional Specialization And Smart Reorganization Of A Regional Airport System.

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Background/Hypothesis

The reopening of the Salerno Costa d'Amalfi Airport in 2024 represents a pivotal phase in the restructuring of the Campanian aviation network. This shift should be interpreted not merely through the lens of competition with Naples Capodichino or as a simple decongestion strategy, but rather as the emergence of an integrated regional airport system.

This paper posits that this transformation is simultaneously infrastructural, organizational, and spatial. The two hubs are increasingly characterized by regional integration achieved through unified governance, pervasive digitization, and synchronized communication strategies. Within this framework, “smartness” is defined not as the static implementation of digital technologies, but as an iterative process of coordinated intelligence. This evolving synergy progressively reconfigures the relationship between the airport and its territory, redefining accessibility patterns, catchment areas, and the functional division between metropolitan services and tourism-oriented operations.

Materials and Methods

This study employs a case study methodology integrating a multi-dimensional analysis of airport documentation, longitudinal traffic data, and strategic planning frameworks across three analytical dimensions:

1. Spatial Reconfiguration: Assessment of catchment area shifts following Salerno Airport's relaunch.
2. Functional Differentiation: Comparative analysis of the two hubs on traffic profiles, seasonal dynamics, and territorial orientations.
3. The Smart Ecosystem: Investigation of how digitization and smart solutions foster system integration, shaping relationships between airport infrastructure and its surrounding socio-economic territory.

Results

Naples Capodichino is consolidating its position as the primary metropolitan gateway, while Salerno is emerging as a complementary node serving seasonal, inbound, and territorially selective flows, extending the regional catchment area southward and reshaping accessibility geography. A fully integrated “smart” ecosystem has not yet matured. Instead, the current configuration reveals an evolving socio-technical framework in which digitization constitutes an enabling factor, connecting infrastructure, users, and stakeholders, while aligning development with sustainability objectives.

Conclusions

The Campanian case shows that airport system reorganisation is taking shape through an emerging functional dualism between Naples and Salerno. Smartness can be read not as a fixed model achieved, but as a digital and relational process that supports coordination between airports, territories, and users within an evolving regional system.



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C24.16-Geography of Digital Society and Connected World => Artificial Intelligence (AI) and Planning: What Challenges for the Making of Urban Environments?



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1493 - Urban Planning Under The Digital Silk Road Artificial Intelligence Infrastructures And Governance Hybridisation. Comparative Insights From Pakistan And Serbia

Marie Hiliquin¹

Irsem Europe, /, Brussels-Belgium¹

Background and Hypothesis

This ongoing study engages the dialectical question posed by this session: what does Artificial Intelligence (AI) do to the city and to planning, and conversely, how do urban environments reshape AI systems? Focusing on Chinese smart/safe city models, *zhìhuì chéngshì* (智慧城市) and *píng'ān chéngshì* (平安城市) deployed under the Digital Silk Road (DSR). It examines how AI-based technologies for urban surveillance, control, and optimisation are not simply transferred but undergo complex processes of hybridisation. The hypothesis is that the implementation of these systems in Pakistan and Serbia not only modifies urban governance and spatial arrangements but also reshapes the operational logics and social functions of the AI systems themselves.

Materials and Methods

The study is based on a comparative analysis of Lahore and Belgrade, two cities where Chinese AI-powered systems (notably Safe City platforms integrating CCTVs, facial recognition, and predictive analytics) have been deployed. It draws on institutional documents, procurement records, media coverage, and expert interviews, triangulated with Chinese-language policy material. Analytical dimensions include the role of AI in different phases of urban development (infrastructure, security, flow management), the socio-technical artefacts through which AI is embedded, and the political-economic configurations shaping deployment.

Results and Conclusions

Findings indicate divergent trajectories of adaptation. In Lahore, a centralised, police-led model aligns closely with Chinese templates, enabled by BRI-linked financing and minimal regulatory friction. In Belgrade, deployment is shaped by EU regulatory pressures and public scrutiny, resulting in partial implementation and legal contestation. These cases illustrate how the city itself co-produces AI logics: reshaping their architecture, intended functions, and legitimacy. The study highlights that Chinese AI urbanism and related planning through the DSR does not produce uniform smart cities but site-specific hybrids, contingent on local planning regimes, legal orders, and geopolitical alignments. It contributes to understanding AI as both a technological and geopolitical instrument and calls for policy frameworks that account for the scalar and institutional complexities of its urban embedding.



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1595 - Geographers In The Age Of Artificial Intelligence Professional Reconfigurations In The Fields Of Planning And Urban Development

Kimberley Du Buat ¹

Paris I Panthéon Sorbonne, Geography, Suresnes-France ¹

Context / Hypothesis:

My PhD thesis (to be defended in spring 2026) investigates the professional roles and identities of geographers in France, offering the first socio-geographical analysis of the profession. The four main employment sectors for geographers are higher education and research (20%), urban studies (10%), spatial planning (14%), and digital technologies and GIS (15%). The growing integration of artificial intelligence (AI) into the planning and urban development sectors is therefore expected to reshape the professional landscape of geographers in significant ways.

Materials and Methods:

The research draws on a survey of 1,000 geographers and a series of qualitative interviews in which the topic of AI was explicitly discussed. Interviewees include organizers of the Festival International de Géographie, a representative of AFIGÉO (the French Association for Geographic Information), and a leader of AFNEG (the National Federation of Geography and Planning Student Associations).

Results and Conclusions:

The emergence of AI is likely to trigger rapid and substantial changes in the profession, especially regarding GIS expertise and data analysis. Geographers who adapt to these technological transformations and seize the opportunities offered by AI may play a pivotal role in the field of urban and regional planning. As one interviewee put it: “Being a geographer is therefore a real asset for better understanding and analysing the complexity of our world and the transitions it is currently undergoing. To be a geographer today also means having a strong interest in technologies: computing, satellite and aerial imagery, artificial intelligence, and so on.” (E286).



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1902 - From Street Imagery To Precision Governance A High Resolution Sensing Framework For Monitoring Urban Waste Patterns

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High-quality streetscape maintenance is a fundamental indicator of precision urban governance and reflects the intensity of human-environment interactions. However, effective management in high-density metropolises is constrained by the lack of real-time, high-resolution spatial data. Traditional manual inspections inevitably leave surveillance blind spots in marginalized areas, failing to capture the dynamic distribution of urban disorder. While computer vision offers a solution for automated auditing, existing models struggle to handle the high spatial heterogeneity of street-level waste. These objects vary significantly in scale, from scattered litter to bulk dumping, and are often obscured by cluttered urban textures, leading to detection failures. To address these challenges, this study proposes a context-aware sensing framework based on an enhanced Real-Time Detection Transformer (RT-DETR) tailored for complex urban scenarios. Departing from conventional fixed-kernel architectures, our model innovatively constructs a dual-branch feature refinement system: a normalization-based attention mechanism is introduced to rigorously suppress high-frequency background noise, while a selective large-kernel module mimics multi-scale cognitive attention to dynamically adjust receptive fields. This structural synergy effectively resolves the semantic conflict between clutter suppression and the capture of extreme-scale targets. Empirical validation demonstrates that this framework significantly improves detection robustness in complex scenes compared to baseline models. By transforming unstructured street view imagery into quantifiable spatial intelligence, this research provides planners with a robust tool to visualize pollution hotspots and optimize sanitation resource allocation, thereby supporting data-driven and proactive urban governance.



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2658 - Space As A Scarce Resource In The Context Of Ai Machine Deployment

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Artificial intelligence is not a new technology, nor is it a homogeneous one. Its origins date back to the years following the Second World War (Rose, 1986; Crevier, 1999), with the work of Norbert Wiener (1948) who defined the cybernetic foundations of “intelligence.” This notion, much debated since then, is thus based from the outset on an ambivalence between a cognitive approach that aims to reconstruct human intelligence and a cybernetic approach in which intelligence refers to the capacity acquired by sociotechnical systems to collect and analyze information – according to a meaning that can be found, for example, in the “I” of “CIA” (Central Intelligence Agency).

Despite nearly 80 years of technological, scientific, and philosophical development, what changed at the turn of the 2020s was the entry of AI into the “implementation era” (Lee, 2018), particularly in the broader urban sphere. Urban innovations claiming to be AI-powered are thus increasingly numerous and varied. Examples include robots such as autonomous vehicles and delivery drones, “city brains” (City Brains) that underpin predictive governance, and a myriad of lighter applications (urban software agents). This new age of AI coincides with its urbanization, that is, its deployment in an open and complex environment (Batty, 2024).

As discussed by Cugurullu et al. (2024), one of the main characteristics of the deployment of urban AI is the still tentative emergence in urban spaces of a “more-than-human fauna.” This emergence of a new fauna raises the question of the sharing of urban space, understood as a scarce resource, whether conceived in 2D (plan) or 3D (volume). Given the structural scarcity of urban space, at whose expense or detriment is the colonization of urban space by AI machines taking place? This presentation discusses the spatial effects in terms of planning and the dynamics of competition for control of urban space among the various forms of corporeality (human organic bodies, non-human organic bodies, inorganic bodies) brought about by the contemporary emergence of AI machines.



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C24.16-Geography of Digital Society and Connected World => Digital Night Studies



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1416 - Leaf Fall Witnessed By Nighttime Light A First Attempt To Detect Urban Leaf Fall Dates Using Satellite Nighttime Light Data

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Background

Urban vegetation phenology, particularly leaf fall periods, significantly influences urban ecology, seasonal green space accessibility, and climate adaptation strategies. Conventional optical remote sensing approaches face substantial limitations in densely built-up areas, as they primarily detect canopy color changes rather than actual leaf abscission, and are prone to mixed-pixel effects from shadows and building interference. We hypothesize that nighttime light (NTL) data can provide a novel, cost-effective proxy for detecting seasonal vegetation dynamics in urban environments by capturing the reduction in light scattering caused by leaf loss during autumn.

Materials and Methods

This study utilized the high-quality daily nighttime light (HDNTL) dataset (2012–2024), derived from NPP-VIIRS VNP46A2 after corrections for spatial mismatch and angular viewing effects. Validation relied on in-situ street-level images capturing actual leaf fall timing at selected deciduous tree sites in Beijing, Boston, and New York City. Time-series analysis involved LOESS smoothing followed by logistic curve fitting, with leaf fall date identified as the point of maximum slope on the fitted curve.

Results

Significant increases in NTL radiance closely aligned with observed leaf fall periods in deciduous urban trees across the study sites. Detected phenological onset dates matched ground-truth observations with a root mean square error (RMSE) of approximately 5 days and a mean bias of 0.77 days, demonstrating high accuracy even in complex urban settings. In addition, preseason temperature and precipitation exhibit significant positive associations with delayed leaf fall, whereas more frequent strong-winds show a negative association with leaf fall date.

Conclusions

Nighttime light (NTL) data provide a reliable, innovative alternative for monitoring urban vegetation leaf-fall phenology in challenging built environments. This approach not only supports sustainable management of seasonal green space accessibility but also enables assessment of how urban artificial lighting and local climate reshape vegetation phenology, contributing to a renewed geographical engagement with the night in the digital era. Future work will integrate multi-sensor fusion for enhanced accuracy.



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2675 - Enhancing Phenology Modeling Through The Integration Of Artificial Light At Night Effects

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Spring vegetation phenology is strongly regulated by photoperiod, making it highly sensitive to disruptions from artificial light at night (ALAN). While climate warming is a well-documented driver of advancing spring phenology, the relative contribution of ALAN-and the environmental factors modulating its effects-remains poorly understood. To address this gap, we investigated the impact of ALAN on the start of the growing season (SOS) across the extra-tropical terrestrial ecosystem ($>30^{\circ}\text{N}$) of China, a region experiencing rapid urbanization. Using three independent satellite-derived phenology datasets and harmonized global nighttime light (NTL) data from 2001 to 2018, we quantified the influence of ALAN on SOS at both ecosystem and major climate zone scales.

Our results show that ALAN significantly advanced SOS, with this effect diminishing toward lower latitudes and in high-elevation ecosystems. Notably, the phenological advancement due to ALAN was amplified in areas with fewer winter chilling days and at greater distances from city centers - suggesting complex interactions between light pollution, thermal constraints, and urban-rural gradients. Building on these findings, we developed an improved SOS estimation model that explicitly incorporates ALAN. The new model demonstrates superior performance compared to conventional approaches, as evidenced by a higher proportion of statistically significant pixels, stronger correlation coefficients, reduced root mean square error (RMSE), lower Akaike Information Criterion (AIC), and enhanced Kling-Gupta efficiency (KGE).

This study underscores that ALAN is a critical anthropogenic factor shaping spring phenology, with its effects mediated by latitude, elevation, and winter chilling accumulation. By integrating human-induced light pollution into phenological modeling, our work advances understanding of how urbanization interacts with climate change to alter terrestrial ecosystem dynamics-offering valuable insights for forecasting vegetation responses under future global change scenarios.



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2768 - E Hailing Taxi Drivers And Algorithms Paradoxes Of The Connected Night And Mapping The Invisible In Grand Nokoué

Raynald Ballo¹

Umr Idees, Geography, Le Havre-France¹

In Grand-Nokoué, nighttime radically transforms the function of transportation: private hire vehicles and taxis cease to be mere means of mobility and become essential security infrastructure where the state and light fade away. Yet a paradox remains: while the need for digital traceability seems vital after sunset, collaborative shared mobility models are collapsing in favor of the misuse and individual use of private hire vehicles. This paper examines this breaking point: why does technology, which is supposed to provide reassurance through data, clash so violently with the realities of nighttime in Benin?

Based on immersive action research and a survey of 1,440 stakeholders, we explore two sociocultural “unthoughts.” On the one hand, digital talismanism: we analyze how passengers invest smartphones, via GPS, with a quasi-ritual function of protection, attempting to rationalize an urban space perceived as spiritually hostile (Vodoun beliefs). On the other hand, we reveal the role of the taxi driver as a “night watchman.” At night, drivers do not blindly follow the algorithm; they navigate according to a vernacular geography of risk. The failure to adopt platforms often results from a conflict between the “truth” of GPS data and the “truth” of the terrain mastered by the driver, a true shadow cartographer.

In conclusion, this paper argues for moving beyond the “techno-push” paradigm. For ride-hailing services and platforms to become levers of spatial justice (Vasconcellos, 2014), they must integrate this local knowledge and embrace hybridization. Lasting acceptance will not come from mere technical superiority, but from recognition of the social function of taxi drivers, transforming digital tools into a “shield” adapted to the vulnerabilities of peripheral areas (Möhlmann et al., 2019; Kiba-Janiak, 2022).



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C24.16-Geography of Digital Society and Connected World => Digital Planning and Territories



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1091 - Smart Adaptation Strategies For Shrinking Municipalities In Finland

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This study investigates the phenomenon of shrinking regions in Finland and the strategies municipalities employ to adapt to demographic decline. While regional development has traditionally focused on growth, over two-thirds of Finnish municipalities have experienced population loss due to low birth rates and outmigration. The paper introduces the concept of “smart adaptation,” which emphasizes sustainable planning and restructuring to maintain quality of life despite shrinking populations. Drawing on municipal strategies and expert interviews from three case municipalities—Muonio, Puumala, and Merikarvia—the research identifies adaptation measures such as infrastructure downsizing, service network adjustments, inter-municipal cooperation, and initiatives to enhance residents’ well-being. Findings reveal that smart adaptation is highly context-dependent and often intertwined with traditional growth-oriented policies. Although strategies like creating new regional identities, promoting multi-local living, and improving service accessibility were perceived as effective, challenges related to financial constraints, organizational capacity, and stakeholder collaboration persist. The analysis shows that smart adaptation is not a place-based process requiring long-term commitment and flexibility. As such, the study highlights the coexistence of growth and decline within regions, challenging binary development models and nuanced approaches integrating demographic realities with local characteristics. Given projected population decreases in rural Finland, incorporating smart adaptation into municipal strategies is suggested for sustaining vitality and resilience. The paper concludes that while adaptation cannot reverse long term trends, it can mitigate negative impacts and foster sustainable futures for shrinking communities.



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1253 - From Invisible Infrastructure To Everyday Life How Data Centres Shape Social Worlds In China

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Data centres, once hidden, technical infrastructures, have rapidly become central to the organization of everyday life. Yet their profound social, spatial, and political implications remain insufficiently understood, particularly in non-Western contexts where data infrastructures intersect with state developmental agendas. This presentation investigates how large-scale data centres reshape the lives of ordinary people through a critical examination of a few examples in China's inland and coastal regions. Drawing on multi-year fieldwork and interviews with local residents, officials, and technology actors, the study conceptualizes data centres as infrastructures arising from the structure-technology nexus: materially intensive complexes resulted from struggles among actors over land, energy, and labour, yet simultaneously legitimized through powerful governmental technologies (e.g. discourses of innovation, sustainability, and poverty alleviation).

Empirically, our cases reveal the deep entanglement between data centre development and the everyday experiences of local communities. While the data centre industry is often celebrated for clean growth and digital innovation, its on-the-ground impacts are uneven. Land-intensive mega-projects have triggered significant rural land expropriations, reconfigured livelihoods, and altered local socio-economic hierarchies. Many displaced villagers have been drawn into new forms of employment, such as service work in data-centre parks or have become landlords renting to incoming workers. Others have faced inadequate compensation and exclusion from the benefits of the digital economy. These differentiated outcomes highlight how the rise of data infrastructures reshapes who gains, who loses, and how people make sense of changing futures.

The analysis demonstrates that data centres are far from passive back-end infrastructures; they actively reorganize social life, employment structures, mobility patterns, and local political relations. By foregrounding the cultural, material, and political dynamics underlying data-driven development, this presentation contributes to emerging debates on the geographies of digital infrastructure and offers new insights into how the data economy is lived and contested in everyday urban-rural settings.



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1669 - What Are The Smart City's Actual Geographical Boundaries Evidence From New York City. **Philippe Vidal¹**

University Jean Monnet, Geography, Saint-etienne-France ¹

This paper examines the geographical boundaries of smart cities. The working hypothesis is that the true perimeter of the smart city does not correspond to the one defined by institutions, but emerges through the deployment of new urban digital services and their alignment with administrative boundaries within the metropolitan space. Instead, it emerges through the deployment of new urban digital services and their more or less faithful alignment with administrative boundaries within the metropolitan area.

Focusing on public and private supply-side initiatives that explicitly claim to be part of the smart city agenda rather than patterns of use, this hypothesis is tested through the case study of New York City. As well as having pursued a smart city strategy since the 2010s, New York City provides a wide range of open data which ultimately makes it possible to identify the smart city's effective perimeter, highlighting both privileged areas and those that are overlooked or neglected.

Using a spatial analysis methodology, the findings reveal that New York City's smart city is an innovative space with variable geometry. While certain areas are strongly shaped by smart city initiatives, others are far less affected, effectively relegating some residents to the status of the 'left behind' of the smart city.



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C24.16-Geography of Digital Society and Connected World => Digital Societies, Peace-Building, and the Production of Territorial (In)Justice



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1452 - Research On The Distortion Of Urban Pseudo Human Settlements Based On Social Media

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Social media has transitioned from a passive reflection of urban reality to an algorithmically-driven “pseudo-environment” that actively shapes public cognition of cities. This transformation results in systematic distortions between digital representations and physical-social spaces; however, conventional urban studies consider platform algorithms as neutral conduits rather than as agential producers. This research addresses this critical gap by introducing the Algorithmic Spatial Production (ASP) framework, which reconceptualizes urban distortion as a co-constitutive outcome of a dual-agent system involving heterogeneous human users and algorithmic rule-systems. Theoretically, ASP advances three core innovations: (1) elevating algorithms to the status of co-producers alongside humans within a “human-algorithm” dyad; (2) proposing a tripartite spatial ontology comprising physical, social, and algorithmic spaces wherein the algorithmic layer mediates and remodels reality; and (3) developing “shadow metrics” and “counterfactual governance” tools to operationalize the opaque algorithmic agency. Methodologically, this study pioneers a reverse-agent analytic pipeline comprising: unsupervised Gaussian Mixture Modeling for human agent typology (e.g., emotional tourists, influencers, and silent residents); three shadow indicators—hot-search residuals, viral-acceleration rates, and content-duplication proxies—to approximate algorithmic preferences; as well as a seven-dimensional distortion index system that spans visibility, demographic representation, semantic expression, sentiment polarization, voice inequality, information propagation bias, and activity intensity, all measured against real-world baselines comprising POI distributions and census data. Empirically, this research designs a comprehensive case study of Dalian, China, by integrating over 800,000 geo-tagged Weibo posts (2019–2025) with multi-source urban data. The ASP method chain utilizes LightGBM along with SHAP attribution analysis to quantify the marginal contributions of both agent types, revealing non-linear thresholds and mechanisms of co-production. Counterfactual policy simulations assess adjustments to algorithmic parameters (e.g., de-weighting super-users and cooling hotspot topics) as low-cost governance levers. This research attempts to promote a paradigm shift from “user behavior analysis” to “dual-agent co-production” within urban theory, providing a replicable and data-driven template for diagnosing and governing digital spatial distortions. This research provides actionable insights for the implementation of China’s Algorithmic Recommendation Management Regulations, thereby advancing urban governance from “managing people” to “regulating algorithms.”



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1606 - Digital Technologies And Territorial Cohesion The Case Of The Cimbrian Ethnolinguistic Minority

Eros Roncen¹

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This contribution examines the Cimbrian ethnolinguistic minority in Italy, settled between the regions of Veneto and Trentino–Alto Adige, with particular attention to its historical, social, and linguistic dynamics. Language, in particular, is an essential component of a community's cultural identity and, as such, constitutes a right that must be protected.

The aim of this contribution is to enhance the Cimbrian cultural heritage in order to foster internal community cohesion and encourage the continuation of its cultural and linguistic practices, as the Cimbrian language is endangered. The research, which is still ongoing, seeks to activate a bottom-up participatory process aimed at collecting and disseminating local narratives, countering stereotypes and restoring complexity to the identity of this minority.

Particular attention is devoted to digital communication as a tool for mediation and the co-creation of values, capable of connecting academic research with active citizenship. The core media output of the project is the production of podcasts, a form of storytelling accessible to a broad audience, capable of creating deep connections with listeners and enabling the dissemination of knowledge aimed at the recognition of Cimbrian cultural heritage and identity values, especially among younger generations. The multimedia and interdisciplinary approach, drawing on perspectives and skills from media studies, cultural studies, and digital humanities, can contribute to the debate on the protection of ethnolinguistic minorities, the enhancement of their intangible cultural heritage, and the mitigation of socio-territorial conflicts in the direction of spatial justice.



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1720 - Beyond The Ai Agenda Territorial Implications Of Artificial Intelligence In The Milan–cortina 2026 Winter Olympic Games

Andrea Brambilla¹

Iulm University, Studi Umanistici, Milano-Italy ¹

The Olympic Games are a mega-event with a strong geographical dimension, generating a range of consequences for host territories that can be summarized through the concept of legacy, understood as the material and immaterial heritage left by the Games. The concept of legacy is now widely studied and has become central both to the elites involved in bidding processes to host the Games and to the policies of the International Olympic Committee (IOC). Alongside legacy-oriented policies, in 2024 the IOC introduced the Olympic Agenda on Artificial Intelligence, aimed at harnessing the transformative power of new technologies within the IOC's framework and at preventing the Olympic Games from being overshadowed by AI, instead encouraging engagement with AI and its consequences, as is occurring globally.

While territorial centrality remains fundamental to the IOC's actions, the Olympic AI Agenda never explicitly refers to territory, focusing primarily on sport and athletes' performance. However, the concrete and current implications of AI—clearly visible in the preparation and staging of the Milan Cortina 2026 Winter Olympic Games—involve multiple territorial actors, including those not addressed by the AI Agenda. The use of artificial intelligence in the Olympic context has thus extended beyond the guidelines of the AI Agenda, directly affecting territories and ongoing conflicts.

From the perspective of promoting technologies that benefit local communities, this conference aims to methodologically analyze the discrepancies between the IOC's official discourse and the actual territorial applications of artificial intelligence during both the preparatory phase and the staging of the Milan Cortina Winter Olympic Games, examining how AI reshapes the management of territorial conflicts and absorbs the language through which such conflicts are governed.



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3263 - Hybrid Geographies Young People And Physical Digital Public Spaces In Bucharest

Alex- Darius¹

University Of Bucharest, Geography, Oradea-Romania ¹

Background/Hypothesis: In an increasingly digital world, Bucharest has moved into a sort of hybrid space in which its built environment is impossible to think of without its digital interface. Not only is “instagrammability” far from being an aesthetic issue, but it is also an important form of social capital in its own right, which dictates the mobility of young people and their appreciation of the environment. Sociability is thus examined not as something anchored solely in material infrastructure, but as a phenomenon co-produced through the reciprocal flow of digital connectivity

Materials and Methods: Capturing this shift involves a mixed-methods approach, tracing digital footprints and hashtags on Instagram & TikTok to observe the city’s pulse. Four distinct sites illustrate the diversity of hybrid spaces: the Old Town, Calea Victoriei, Amzei Square, and the Grozăvești Campus. By comparing these digital traces with real-world usage patterns, it is possible to identify the dynamics of different urban nodes within a layered landscape.

Results: The findings reveal a distinct hierarchy of hybridity across the studied locations. Amzei Square stands out as a node where digital value has outpaced its physical infrastructure, sustained by an active artistic community with considerable online traction, while Grozăvești Campus operates as a functional outpost, densely occupied yet largely invisible in networked space, being a “digital ghost”. Additionally, the shift away from the tourist-saturated Old Town toward the more fluid “phygital” energy of Calea Victoriei, suggests that the urban prestige of a space is increasingly conditioned by its capacity for performative digital engagement.

Conclusions: “Instagrammability” is becoming an important element of modern urban identity. As Bucharest’s evolution is now driven by hybrid flows, rather than the traditional material planning model, an interdisciplinary regeneration strategy is necessary. Future spaces must resonate with the connected realities of younger generations, acknowledging the digital layer not as a superficial overlay, but as a structural component of the city’s social heart.



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C24.16-Geography of Digital Society and Connected World => Geospatial Technologies and Addressing Urban and Rural Sustainability Issues



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1459 - Theory And Practice Integration And Development Of Human Settlements Geography

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Human Settlements Geography leverages the comprehensive strengths of geography that are recognized both in China and internationally. Therefore, Human Settlements Geography represents the mature evolution of the discipline of geography through interdisciplinary integration. Human Settlements Geography directly responds to the public's aspirations for superior human settlements and fulfills critical national priorities. Compared to urban, economic, and behavioral geography, Human Settlements Geography's theoretical frameworks, practical applications, and integrative development remain under-explored. To advance this field, delineating its theoretical underpinnings across the following five key dimensions is essential: foundational theories, theoretical frameworks, geographical scales, research paradigms, and thematic narratives. Central to the discipline is the exploration of human-settlements relationships, which are approached through both "three dimensions" and "three elements" perspectives. By capitalizing on the unique interplay of "three states," the discipline advocates for an open integration model, proposing a novel pathway for Human Settlements Geography, which is poised to navigate three pivotal avenues: engaging with new scientific inquiries, adopting innovative data and methodologies, and embracing progressive development concepts. This strategy aims to transition Human Settlements Geography from a specialized intersection of interdisciplinary study to a more encompassing and influential field, marking its significance as a major branch of geography and a substantial discipline. The synthesis of theoretical depth, practical relevance, collaborative integration, and strategic development in Human Settlements Geography seeks to catalyze cross-disciplinary synergy and paradigmatic shifts. It aims to meet residents' diverse needs, support evidence-based national development policies, and enhance China's role and authority in shaping global human settlement policies, highlighting the country's dedication to fostering sustainable and habitable human settlements.



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2703 - Analysis Of Shoreline Dynamics Along The East Coast Of South Africa Using Qscat And Landsat Time Series (1985–2025)

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Coastal erosion and sediment deposition are two interconnected processes shaping sandy shorelines worldwide. On South Africa's KwaZulu-Natal coast, erosion at Alkantstrand Beach in Richards Bay and deposition at Mtunzini Beach pose contrasting challenges for coastal management. This study assesses shoreline dynamics at both sites using multi-decadal Landsat imagery (1985–2025) processed in Google Earth Engine for shoreline extraction and the QGIS Shoreline Change Analysis Tool (QSCAT) for shoreline change computation and forecasting. Using QSCAT, the study provides transect and area-based metrics such as Linear Regression Rate (LRR), Net Shoreline Movement (NSM), and Shoreline Change Envelope (SCE), as well as projections of future shoreline positions. Study findings reveal that the Mtunzini–Richards Bay coastline exhibits strong spatial variability in shoreline behaviour. For instance, the Net Shoreline Movement in the Richards Bay segment ranges from severe erosion of -221.75 m to pronounced accretion of +239.7 m in localized depositional zones. Whereas the LRR varies between -3.76 and +4.58 m/year, confirming the coexistence of rapidly eroding and accreting shoreline sections. The SCE values indicate an average of 77.4 m, with the highest variability concentrated in harbour-influenced segments. Overall results indicate that erosion will dominate future shoreline trends, with a mean shoreline retreat of -10.82 m by 2035 and -21.02 m by 2045. Richards Bay is projected to remain the primary erosion hotspot, while the Mtunzini dune-field shows localized accretion driven by foredune development, although this accretion weakens toward 2045. These findings have important implications for coastal planning along the KwaZulu-Natal coast, highlighting Richards Bay as a critical erosion hotspot requiring targeted management interventions, revised setback lines, and strengthened dune protection measures. The study further demonstrates the value of integrating Google Earth Engine with QSCAT as a cost-effective, reproducible framework for long-term shoreline monitoring to support evidence-based coastal zone management and climate adaptation planning in South Africa.



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C24.17 Geography of Tourism, Leisure, and Global Change => Inclusive Tourism and Leisure: Global Design, Local Realities



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1119 - Internalizing The External Investigating How Structural Barriers Lead To Psychological Barriers Among Deaf Tourists

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While tourism and travel research has gradually focused on physical disability, there have been few theoretical opportunities to address the travel experiences of deaf people. According to the World Health Organization (WHO), almost 1.5 billion people are projected to live with some form of hearing loss by 2025; however, their travel barriers still exist and are often less visible compared to those of other disabled tourists. This lack of attention has consequently led to slow progress in both the design of service environments and academic research specifically targeting deaf tourists. This situation is particularly evident in tourism and leisure design within Asian countries.

To address this research gap, this study employs in-depth interviews with nine deaf tourists in Japan to understand the barriers they face in tourism experiences. The aim is to unveil the process by which external failures shape the psychological reality of deaf travelers and identify suitable solutions for improving their travel experience. Building upon existing literature on travel barriers for people with disabilities, this research first analyzes the barriers encountered by deaf tourists, originating from both external (industry and societal) and internal (interpersonal and intrapersonal) sources. Second, the study explores how deaf tourists narrate the transition from encountering repeated industry barriers or societal barriers to developing or reinforcing specific psychological constraints. Finally, based on the deaf tourists' experiences in managing travel difficulties, this research proposes policy suggestions for alleviating their travel barriers.

Through this analysis, the study identifies that the most common barriers faced by deaf tourists stem from the unconscious neglect of the tourism industry. This industry neglect and lack of understanding result in learned helplessness and self-stigma among deaf tourists, which further intensify their psychological burden regarding travel. Based on the findings, this research further discusses the application and extension of the social model of disability within deaf tourism development in Japan and proposes environmental improvement suggestions based on the most effective coping behaviors employed by deaf tourists.



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1634 - Understanding Inclusive Service As A Path To Innovation A Study Of Traditional Hospitality In Japan

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Traditional hospitality in Japan, particularly long-established hot spring resorts, is increasingly challenged by population aging, labor shortages, and the diversification of tourism demand. In parallel, inclusive service has emerged as a key priority in contemporary service research (Fisk et al., 2018). Despite its normative importance, however, the practical adoption of inclusive service in legacy hospitality contexts remains limited and uneven.

Prior studies point to an “inclusion delusion,” in which inclusion is recognized at a rhetorical or policy level but weakly embedded in everyday service practices (Rosenbaum et al., 2020). Existing research often frames this gap as a problem of implementation failure. This study takes a different approach by conceptualizing inclusive service as a potential pathway to service innovation, particularly in culturally embedded industries where radical change is difficult to achieve.

Drawing on service innovation literature, this study adopts a non-technology-centric view of innovation, recognizing that service innovation often emerges through incremental, non-technical changes in interactions, organizational routines, and meanings (Sundbo & Gallouj, 1998; Toivonen & Tuominen, 2009). From this perspective, early-stage awareness, hesitation, and small adaptive practices related to inclusion may function as forms of micro-level service innovation that gradually reshape service systems and legitimize change.

Empirically, this study employs a qualitative, cross-case research design focusing on a traditional hot spring region in Japan. Data are collected from three groups of actors: local government departments responsible for tourism and welfare, regional hot spring tourism associations, and managers of traditional ryokan. Through within-group and cross-case analysis, the study examines how inclusive service is understood, negotiated, resisted, or tentatively embraced, and how these interpretations relate to emerging innovation dynamics.

The findings suggest that inclusive service is commonly perceived ambivalently—as both a moral responsibility and an operational burden—but under certain organizational, cultural, and institutional conditions, it can act as a catalyst for incremental service innovation. By framing inclusive service as a process of becoming rather than a state of achievement, this study contributes to service and tourism research by clarifying how innovation can originate from readiness, dialogue, and small steps within legacy hospitality settings.



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2373 - Accessible Nature And Inclusive Well Being In Protected Areas The Case Of Vesuvius National Park

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Background/Hypothesis

Vesuvius National Park stands as a pioneering example of how accessibility and well-being can be seamlessly integrated. The Park's initiatives aim to promote social inclusion and environmental awareness through projects that merge accessibility, ecological restoration, and community engagement. This study explores how these interventions contribute to reducing inequalities in access to nature and promoting spatial justice in protected areas.

Materials and Methods

The analysis focuses on two recent projects implemented by the Park Authority within the framework of ECST (The European Charter for Sustainable Tourism): Percorso Vita Easy, an outdoor fitness trail in Somma Vesuviana, and La Pineta di Terzigno (Trail 11 – The Terzigno Pinewood), an accessible walking path in the municipality of Terzigno. Data were collected through field observations, institutional reports, and qualitative interviews with project managers and local stakeholders. Particular attention was paid to design principles, material choices, and community participation processes that shaped both initiatives.

Results

Both projects demonstrate how accessibility can be embedded into sustainable territorial planning. Percorso Vita Easy combines physical activity, recycling, and education for sustainability through gym equipment made of 100% recycled plastic. La Pineta di Terzigno, constructed using natural materials and bioengineering techniques, offers an inclusive sensory experience enhanced by digital tools such as QR codes and the AI guide “Mr Plinio.” Ecological restoration measures following the 2017 wildfires ensured biodiversity recovery and ecosystem resilience.

Conclusions

The integration of environmental sustainability, accessibility, and digital innovation at Vesuvius National Park provides a replicable model for inclusive tourism in protected areas. By fostering both physical and sensory accessibility, these initiatives demonstrate how responsible tourism can enhance well-being, community empowerment, and ecological awareness—contributing to more equitable and sustainable development pathways across Europe.



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2647 - The Contrast Between Inclusive Design And Genuine Inclusivity For Employees With Disabilities Within 4 5 Star Hotels.

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This study aims to evaluate the gap between inclusive design and authentic inclusivity within the hospitality industry. Existing research has shown that inclusivity within the South African hospitality industry continues to be directed at vacationers with limited consideration given to the labour force, ruminating on grounds that persons with disabilities remain one of the most underrepresented marginalised groups within the workplace. Given that the public sector has repeatedly failed to meet disability quotas, one way to address this is through inclusive design. To achieve this aim, a qualitative approach was adopted to obtain insights into reasonable accommodation of persons with disabilities through semi-structured interviews, with purposive sampling. The findings indicated that hotels that employ persons with disabilities perceived that employees can be reasonably accommodated in any department within the hotel. Comparably, hotels that did not employ persons with disabilities believed that persons with disabilities could only be reasonably accommodated within specific departments within the hotel, particularly in administrative roles that are not guest-facing, highlighting that the most significant barrier to reasonable accommodation is attitudes towards persons with disabilities. Additionally, the study found that while hotels had facilities to accommodate persons with disabilities, these accommodations were primarily for guests rather than employees, which can be attributed to a reputational and triple-bottom-line stance, as well as compliance with the Tourism Grading Council's benchmark for hotel grading. Moreover, the study found that a significant portion of the hotels were old office buildings that were converted explicitly for the 2010 World Cup; as a result, they lacked physical accessibility infrastructure, such as ramps. What is more, the hotel has elevators; however, most are not suitable for persons who are visually impaired and have impaired hearing. These findings contribute to industry management practices that promote inclusive infrastructure and humanise attitudes towards employees with disabilities, thereby increasing hiring initiatives for persons with disabilities. Finally, they add to the literature on reasonable accommodation for people with disabilities in the hospitality industry in the global south, thereby making a theoretical contribution.



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C24.17-Geography of Tourism, Leisure, and Global Change => Borders and Tourism: Borders as Spaces of Connection and Cooperation



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1668 - Maritime Borders As Spaces Of Cooperation And Division Lessons From The Baltic Sea Region **Denis Cerić¹**

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Maritime borders are dynamic and complex, serving as both barriers and bridges in cross-border tourism development. This research explores the evolving role of maritime boundaries in the Baltic Sea Region (BSR), a unique case where integration and cooperation have transformed the sea into a semi-internal EU maritime space. Drawing on findings from multiple research projects and empirical studies, this chapter examines how cross-border tourism in the BSR has been shaped by factors such as EU funding, historical legacies, and geographical constraints.

The bordering–debordering–rebordering framework is employed to analyze how maritime borders function as spaces of interaction and negotiation. The BSR provides valuable insights into the potential and limitations of transboundary tourism development. Despite substantial EU support through programs like Interreg, cooperation in maritime areas faces challenges, including disparities in development priorities between western and eastern parts of the region, logistical constraints due to the sea itself, and the legacy of the Iron Curtain. These factors have resulted in uneven spatial patterns of cross-border collaboration, with tourism branding and marketing concentrated in the West while the East emphasizes infrastructure and capacity-building.

This research emphasizes the dual role of the Baltic Sea as both a barrier and a facilitator of tourism cooperation. Stakeholders frequently perceive maritime borders as opportunities for fostering shared identities and regional integration. By synthesizing previous findings, the presentation reflects on the broader implications of maritime boundaries for tourism development and explores the persistent challenges that hinder the creation of cohesive transboundary tourism spaces.



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3165 - Developing Cross Border Tourist Attractions In The Polish Czech Borderlands

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This study is positioned within the research strand that views the border as a “resource,” emphasising its presence and impact as an advantage for border areas and their inhabitants (Gerber, Lara-Valencia, and Parra, 2011), as well as its positive effects. The positive and negative effects of borders often coexist (Dołzbłasz, 2015). In this context, transforming the perception of the border from negative to positive—such as by recognising it as a tourist attraction—is particularly significant (Blasco, Guia, and Prats, 2014; Timothy, 1995). Political boundaries influence tourism in various ways, including their role as tourist attractions (Timothy, 2001).

The aim of this paper is to assess the extent to which tourism projects implemented in the Polish–Czech borderlands under the Interreg programme genuinely display a cross-border character and contribute to the development of cross-border tourist attractions. This study employs a mixed-method (MM) approach, combining the collection, analysis, and interpretation of quantitative and qualitative data within a single research design. The quantitative analysis encompasses all cross-border cooperation (CBC) projects co-financed by EU funds (INTERREG, ETC) during the 2007–2013 and 2014–2020 programming periods in the Polish–Czech borderland, defined as the area on both sides of the border. The qualitative component involves a content analysis of project descriptions and an original classification based on three main thematic categories of projects. The study also incorporates a spatial dimension, examining the significance of project beneficiaries’ locations in relation to their distance from the state border and the level of tourist attractiveness.



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3268 - Debordering Rebordering And Tourism Geopolitics And Change In The Global South

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This paper examines current thinking in geopolitics with regard to bordering, debordering and rebordering and the implications of this process for tourism. It examines some of the forces that have brought about debordering (e.g., cross-border cooperation and supranationalism) since the mid-1900s, as well as several forces that initiate rebordering processes in relation to tourism. Among others, these include global security challenges, pandemics, and the heritagization of national borders. All of these processes are directly linked to tourism. From a tourism perspective, the evolution of perceived and physical borders manifests in landscape changes, fluctuations in human mobility and trade in goods and services, common visa and passport regimes, and joint economic policies. This presentation examines these and other linkages between tourism and debordering/rebordering with empirical examples from southern Africa and South America. It surmises how the debordering and rebordering processes are unique to the Global South and the local forces that affect these bordering processes. In particular, borders in the Global South face significant enforcement and security challenges. Conversely, many are also porous with few mobility constraints compared to conditions that exist in much of the Global North. This depends on the relationships between countries and types of transfrontier activities that take place. Likewise, the notion of cross-border tourism differs in many regions of the Global South compared to how it is defined elsewhere. This paper examines the dynamics of cross-border tourism and borderland development from a tourism perspective.



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C24.17-Geography of Tourism, Leisure, and Global Change => Climate Change, Social Vulnerability and Adaptation in Tourist Destinations at the Margins



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1107 - Ageing Spirits At Sea And Regenerating Local Areas The Case Of Sinuessa Combining Agri Food Innovation And Smart Tourism

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The ageing of spirits at sea is an emerging practice in the Italian agri-food sector, representing an innovative frontier for the enhancement of coastal and marginal areas through the production of high-quality spirits. The territory of ancient Sinuessa, in the Litorale Domitio area, offers an ideal context for experimenting with this technique thanks to its morphological and climatic conditions, such as constant temperature, absence of light and marine micro-oxygenation (ANSA, 2025). Several initiatives in Campania linked to Elixir Falernum and limoncello have highlighted the potential of the practice not only in organoleptic terms, but also as a driver of territorial regeneration, social cooperation and new models of experiential tourism.

The research objective is to investigate how the technique of underwater ageing of spirits is perceived by producers, consumers and local stakeholders, and whether it can be integrated into smart, participatory and sustainable tourism strategies for marginal territories. Through a qualitative geographical approach involving local actors, institutions, communities and tourists, the study analyses perceptions and expectations related to this production model, assessing its ability to contribute to the transformation of the territory towards forms of quality, digitally mediated and socially inclusive marine food and wine tourism.

The use of digital technologies and participatory platforms — such as geolocated QR codes, immersive storytelling, and territorial narrative co-creation — allows for the construction of new forms of attractiveness and mapping of cultural resources, with potential benefits for both the product and the place. The case of Sinuessa is presented as a laboratory for territorial innovation in which tradition, technology, submerged heritage and social regeneration intertwine, offering a perspective of sustainable development for Mediterranean suburbs facing global change.



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1764 - Living The Coast Under Climate Change Social Recomposition Cultural Continuity And Development Pathways Along The St. Lawrence (quebec Canada)

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Climate change is reshaping coastal environments through sea-level rise, reduced ice cover, warmer winters, and increasingly intense storm events. While these dynamics are well documented biophysically, their social implications remain too often framed through infrastructure, hazard management, and technical adaptation. Building on the notion of habiter (dwelling) as a situated, embodied and socially differentiated geographical experience, this paper examines how climate-driven coastal change contributes to the recomposition of social relations and local development trajectories along the St. Lawrence estuary and gulf (Quebec, Canada). We argue that adaptation is not only a matter of protecting assets but also a reconfiguration of everyday practices, mobilities, attachments to place, imaginaries and power relations: who can stay, who must move, who decides, and whose knowledge counts. Empirically, the research relies on a multi-sited qualitative design combining interviews, walking interviews, participatory workshops (use-mapping, risk narratives, adaptation scenarios) and policy/document analysis (planning tools, zoning, coastal management programs). Special attention is given to information-sharing, institutional support, mental health impacts, and equity—dimensions that coastal residents consistently identify as central to adaptation. This communication propose the first step of an analytical process aim at producing a typology of differentiated coastal dwelling strategies (protection/armouring; constrained mobility and relocation; commons-based stewardship and renaturalization) and discusses how each pathway redistributes vulnerability and opportunity across residential, tourism, fisheries, transport, heritage, agriculture and ecological concerns. Ultimately, the contribution is to reconnect climate adaptation with lived geographies and territorial justice, providing conceptual and practical leverage for integrated coastal governance in the Anthropocene.



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1799 - Wildfire Impacts And Vulnerability Of Accommodation Businesses In A Marginal Tourist Destination In Portugal

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Background

Wildfires have become an increasingly significant hazard worldwide, driven by climate and land-use change. In recent years, several tourist destinations have been affected by large fire events, exposing tourism systems to sudden environmental shocks. Wildfires impacts may be particularly acute in marginal regions where tourism represents one of the few viable economic activities and adaptive capacities remain low. Accordingly, this study examines how accommodation businesses are affected by wildfires and identifies the factors that shape their vulnerability in a marginal, wildfire-prone tourism region in Portugal.

Materials and methods

The research focuses on Serra da Estrela, the highest mountain range in mainland Portugal, located in the Centro region and encompassing a natural park of 88,850 ha. The area has experienced recurrent wildfires for decades, including several large events in recent years that burned thousands of hectares. The study draws on qualitative data collected through 33 semi-structured interviews with owners and managers of tourism accommodation establishments, covering 48 accommodation units. The interviews explored wildfire impacts on operations, demand, perceived vulnerability and recovery capacity.

Results

Interview evidence shows that wildfires strongly affect tourism operations, primarily through indirect mechanisms. Most respondents reported immediate guest departures and reservation cancellations following wildfire announcements. In the weeks after major events, occupancy rates dropped sharply—even in establishments located far from the burned areas. Most respondents attributed these demand shocks to media coverage, which they felt amplified reputational damage. Physical vulnerability was generally low, as few units were directly threatened by fire, yet indirect impacts affected virtually all establishments. Small, independent businesses, particularly isolated rural lodges, emerged as the most vulnerable.

Conclusions

The findings indicate that wildfires function as a climate-related risk that disproportionately affects marginal tourism regions through impacts on demand rather than through direct physical damage. Vulnerability among accommodation establishments is uneven, with smaller, independent and spatially dispersed units exhibiting heightened susceptibility. In such contexts, climate-related risks compound pre-existing socio-economic fragilities, intensifying uneven vulnerability at both the business and regional scales.



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2195 - Tourism Resilience Associated With Hydrometeorological Events In Tamasopo Puente De Dios San Luis Potosí Mexico

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In the state of San Luis Potosí, located in the north-central part of the country, there are numerous hydrological tourist sites traditionally frequented by national and international visitors. The abundant runoff that forms rivers and waterfalls in the Sierra Madre Oriental, a product of summer rains in this tropical region, creates a diverse mosaic characterized, on the one hand, by its significant tourism potential and, on the other, by a significant rural and indigenous population living in conditions of socioeconomic marginalization. Tamasopo, in particular, is a charismatic tourist destination due to its waterfalls, which are among the most popular spots in the state.

However, year after year, the effects of hydrometeorological hazards that occur during the summer increase vulnerability and hinder the resilience of the inhabitants to recover from them. In this context, the central idea is that the capital approach allows for the assessment and differentiation of tourist destinations based on their level of resilience. This tool serves as an instrument for identifying those areas that recover best from threats and the factors that explain this behavior.

Therefore, the study first discusses the cognitive foundations of tourism resilience within the context of integrated risk management and the geographical attributes that influence tourism development in the area under examination. Subsequently, using the capital approach, physical, economic, human, and social resilience of each territorial unit of analysis was calculated. With the support of probabilistic typification, ten zones were identified within these locations according to their level of tourism resilience manifested, and their behaviors are described in broad categories, differentiated by adaptive features.

It is concluded that even though some areas were more severely affected by hurricanes and floods, the community's human capital demonstrates strengths, evidenced by robust collaborative networks that enable faster and more efficient recovery of the sites. This provides a foundation for identifying areas where weaker resources need strengthening and maintaining those that are functioning effectively.



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2694 - Vulnerability Of Wildlife Species Relevant To Observation Tourism In The Colombian Páramos

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In recent years, nature tourism and wildlife observation in Colombia have increased, because it is one of the most bio-diverse countries in the world and the signing of the Peace Agreements in 2016 has allowed the opening of some spaces for tourist activities. Nevertheless, climate change is transforming ecosystems and biodiversity, which will affect tourist areas dedicated to nature-based tourism.

Páramo ecosystems cover an approximate area of 1,925,400 hectares, of which 746,644 hectares are located within national natural park areas, making Colombia the country with the largest extent of páramo ecosystems in the world (Rivera Ospina & Rodríguez, 2011). Consequently, páramos play a crucial role and receive special attention within Colombian environmental legislation, as they are essential for water supply and are therefore considered a national priority for biodiversity conservation (Congress of the Republic, 2018). Tourism activities carried out in Colombia's páramos are mainly associated with hiking, birdwatching, and contemplative tourism focused on the observation of flora, fauna, and landscapes (González, 2023).

Nevertheless, the ecosystems and species subject to tourism observation are vulnerable to the impacts of climate change. Accordingly, this study identified wildlife species of touristic interest in high-altitude biotopes páramos. Through a review of literature, the vulnerabilities of these species to climate change were examined, as well as the impact of wildlife observation tourism practices in the paramos located in the department of Cundinamarca. Finally, recommendations were proposed for nature tourism stakeholders to improve the management of wildlife observation practices.



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2716 - Theorizing ‘too Late’ Tourism

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Just before COVID-19 crashed global tourism, Luxury Travel Magazine published a feature titled “Last Chance Tourism: 11 Places to Visit before They Disappear.” Highlighting everything from dying polar bears to sinking islands, the article encouraged readers to “pack a suitcase, grab a camera, and head to one of these amazing destinations before they disappear” (LTM, 2019). Such “last chance” calls illustrate how tourism can function as disaster capitalism, deftly capturing crises--say, climate change or mass extinction--that are partially of tourism’s own making, and then turning those crises into new prospects for accumulation (Klein, 2008). But what about sites that have already reached a state of ruination--landscapes for which it is already too late?

Calls for last chance tourism position tourists as passive sightseers of ecocide, whose role is simply to observe, emote, and return home, chalking up the sad show to just one more harbinger of impending doom. Likewise, sites already in states of ruination tend to be represented for tourism through apocalyptic aesthetic codes of emptiness, decay, and abandonment, possessing a kind of morbid beauty. Can we unsettle this passive “apocalyptic gaze” and instead approach geographies of ruination as living ecosystems and valued sociocultural places--as sites of trouble that we can stay with (Haraway, 2016), as witnesses and caretakers, even when capitalism-based decision making would opt to wring them dry and move on? What role might tourism play in this process?

This conceptual presentation calls for investigation of the relationships between tourism and ruination across geographies that have been colonized, disinvested, neglected, mismanaged, toxically assaulted, or otherwise victimized by the drive to extract profit from place. Specifically, it introduces my current study site, the Salton Sea, as a rich site for studying the role of tourism in landscape destruction and recovery because it is simultaneously a space of ecological disaster, cultural ruin from California tourism’s mid-century golden age, publicly funded environmental education through California’s state park system, and community regeneration through practices of care, including both Native American activism and working-class settler arts-based landscape redevelopment.



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C24.17-Geography of Tourism, Leisure, and Global Change => Community Empowerment, Justice, and the Local in Tourism



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1243 - Exploring Co Created Value From Tourist Perspectives In Forest Based Regenerative Tourism

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This study examines how value is co-created from tourist perspectives in forest-based regenerative tourism, with particular attention to the place-based and relational processes through which such value unfolds. Building on Service-Dominant Logic, the paper responds to calls within tourism geography to move beyond outcome-oriented accounts of value and to consider how tourism experiences are embedded in everyday local contexts. Empirically, the study draws on phenomenographic interviews conducted in a rural Japanese forest destination developed under a regenerative tourism framework.

The analysis identifies four qualitatively distinct ways in which tourists experience value co-creation: sense of connectedness, sense of community, sense of belonging, and self-expansion. These ways constitute a continuum of relational depth and spatial involvement. At initial levels, value is generated through point-to-point encounters, such as guided walks by local residents. As engagement deepens, tourists begin to form connections with multiple people, sites, and practices, giving rise to multi-nodal relations embedded in everyday activities. At more advanced levels, these nodes become interconnected, and tourists' experiences extend from isolated encounters toward a networked relational space, where value is sustained through ongoing participation in local social relations, shared practices, and affective attachments to place.

From a tourism geographical perspective, the findings conceptualize tourism space not as a pre-given setting for consumption but as an emergent relational space, continuously produced through interactions among tourists, local residents, and environments. By tracing how value co-creation evolves from point-based encounters to networked spatial relations, the study contributes to tourism geography by demonstrating that regenerative tourism is inseparable from place-making processes and lived spatial practices, offering a relational understanding of how tourism can support socio-ecological regeneration grounded in the local lifeworld.



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2026 - Scalve Map Participatory Mapping As A Tool For Community Empowerment And Just Tourism

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Tourism development in mountain regions is often shaped by dominant narratives and externally driven models that marginalise local knowledge and community priorities. In the Valle di Scalve, a pre-Alpine valley in the province of Bergamo (Lombardy, Italy), traditional models based on winter ski infrastructure and summer holidaymaking have been challenged by environmental change and shifting tourist behaviours. Participatory mapping can function as a tool for community empowerment, supporting the identification of local resources that are often insufficiently recognised by the communities themselves and promoting alternative tourism imaginaries.

Scalve Map is an ongoing participatory mapping project aimed at documenting the social, cultural, environmental, and economic resources of the Valle di Scalve. The process integrates the collection and systematisation of existing data, field surveys and direct observations, with participatory activities involving residents, associations, and stakeholders, valuing local knowledge and spatial capital. The approach is grounded in the principles of critical cartography, understanding maps as performative and socially constructed tools capable of influencing territorial governance and local decision-making.

Participatory mapping aims to increase community awareness and engagement by highlighting often overlooked resources and narratives and by providing tools for collective reflection on the territory's development, including tourism development. The project seeks to challenge dominant representations focused on ski infrastructure or isolated points of interest, and to foster the construction of alternative tourism imaginaries based on slow, relational, and community-led practices. Finally, Scalve Map highlights the potential of cartography as a tool to support community empowerment.



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2177 - Reheating The Local Sauna Tourism And Values Based Entrepreneurship In Regional Japan

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Background/hypothesis

Recent tourism research has emphasised the local turn that critiques the industry's extractive tendencies, advocating relational forms of community engagement (Higgins-Desbiolles & Bigby, 2023). The process is further complicated by uneven urban-to-rural mobilities that transform peripheral destinations according to urban and neoliberal sensibilities (Yamagishi & Doering, 2025). This paper examines Japan's sauna boom to explore how sauna entrepreneurs articulate sustainability and community collaboration through organisational values and enable longer-term, locally rooted tourism initiatives.

Materials and methods

The study draws on ethnographic research at sauna facilities across regional and rural Japan, combining participant observation, interviews, and videography. The analysis focuses on three interrelated value domains: social, green, and digital values.

Results

The findings reveal how values-based entrepreneurship shapes sauna tourism outcomes. While social and community-oriented values are widely articulated, their embeddedness into everyday organisational practices supports sustained local engagement. Green values are guided by entrepreneurial intent but constrained by infrastructure and regulations, resulting in uneven sustainability practices regionally. Digital values play a double-edged role; online visibility can increase reach but risks privileging short-term consumption unless locally anchored.

Conclusions

The entrepreneurs' sauna tourism initiatives reveal the ambivalent role of values-based business operations. Although sauna facilities can function as sites of community empowerment and even regenerative practice, this requires careful and negotiated mediation. The paper offers insights for sauna entrepreneurs and policymakers while contributing to debates on the local turn in tourism by demonstrating how values-based entrepreneurship operates through contingent socio-material arrangements.

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2273 - Framing Community Action For Justice And Inclusivity In Tourism Governance

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Research on tourism and local development acknowledges the importance of better understanding the context-specific arrangements between the environment, society, policy and the economy in the pursuit of sustainable and inclusive development. In particular, participatory and inclusive planning are increasingly viewed as ways to address fragmented governance and extend decision-making and governance in tourism beyond traditional state and market actors. To date, scholars have primarily focused on the steering initiatives and alternatives that local communities can pursue or on the epistemology of justice and inclusivity through tourism. However, much of the conceptualizations and arguments build on the positivist assumption that this local turn is a spontaneous and unavoidable change that will permeate the existing socio-institutional settings and turn them for the better. Moreover, there is a concerning naivety in the way justice and inclusivity are expected to bring to a genuine change in tourism governance and development.

These assumptions become particularly visible in the growing tensions between, on the one hand, state and economic stakeholders and, on the other, civil society organisations and grassroots associations around issues such as infrastructure development, market regulation, environmental protection and travel-related emissions. Rather than resolving governance failures, participatory arrangements often become sites of contestation, co-optation, or political marginalization. This presentation critically examines how community action for justice and inclusivity is framed, mobilized and constrained within contemporary tourism governance. It explores how participatory initiatives are shaped by existing power relations, institutional logics and policy imaginaries. The presentation shows that community-led action is neither spontaneous nor inherently transformative, but emerges through negotiated, uneven and frequently conflictual processes in the effort to overcome dominant governance structures.

By re-framing community participation as a political practice, this presentation contributes to debates on tourism governance by moving beyond normative calls for inclusivity. It highlights the conditions under which community action can meaningfully influence decision-making, as well as the limits of justice-oriented approaches in tourism when wider structural inequalities and state-market alliances remain unaddressed. The paper concludes by outlining implications for more reflexive and politically attuned approaches to participatory tourism governance.



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2517 - Exploring The Potential Of Regenerative Tourism In South Africa's Rural Landscapes **Siyabulela Nyikana¹**

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Rural communities in the South Africa face persistent socio-economic challenges, including high unemployment rates, underdeveloped infrastructure, and limited access to sustainable livelihoods. Traditional tourism models have often failed to deliver long-term benefits to these communities, sometimes leading to environmental degradation and cultural exploitation. As a response, regenerative tourism, a holistic approach that seeks to restore and enhance social, ecological, and economic systems has emerged as a potential tool for rural transformation. However, the practical application and impact of regenerative tourism in rural South African contexts, particularly in the Eastern Cape, remain underexplored. While tourism holds potential as a catalyst for rural revitalization, prevailing models often fail to deliver equitable and sustainable outcomes for local communities. Policymakers are increasingly called upon to identify innovative, inclusive, and environmentally responsible development strategies. Regenerative tourism, with its emphasis on restoring ecosystems, enhancing community well-being, and fostering long-term resilience, presents a promising alternative. However, there is a lack of localized evidence to guide policy formulation and implementation in this emerging field. This study seeks to investigate how regenerative tourism can be effectively leveraged to drive sustainable rural development in the province, identifying both opportunities and challenges within the local context. In the South African context, literature on regenerative tourism remains limited, though studies highlight the untapped potential of rural tourism in regions like the Eastern Cape. Given the province's socio-economic challenges and ecological assets, there is a compelling need to explore regenerative tourism as a viable tool for transformation. This study seeks to fill a gap in both academic literature and policy discourse by examining how regenerative tourism can be implemented in this setting and what outcomes it may yield for local development. This study contributes to the growing body of knowledge on sustainable and regenerative tourism by contextualising it within rural transformation efforts in the Global South, specifically in South Africa's Eastern Cape Province. This is particularly important as most of the research on regenerative tourism models has been conducted in the well-resourced Global North context



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2520 - When Governance Falls Short Of Place Based Needs The Local Turn And Community Agency In A Peripheral Coastal Territory

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Background / Hypothesis

Recent debates in tourism geography increasingly call for a local turn that places communities and territories at the centre of tourism governance, shifting attention from abstract models to locally grounded practices. In peripheral regions shaped by long-term neglect, environmental vulnerability and fragmented institutions, these conditions create space for bottom-up dynamics through which local actors build skills, resources and collective capabilities to address socio-environmental challenges. This paper understands resilience as a place-based process shaped by power relations, institutional limitations and community agency, arguing that long-term abandonment and institutional fragmentation can paradoxically foster local skills, social capital and collective capacity. It hypothesises that, in the absence of effective governance, local actors and community groups emerge as key agents shaping tourism governance under global environmental change.

Materials and Methods

The study adopts a qualitative case-study approach of the Ebro Delta (Catalonia, Spain), a peripheral coastal region vulnerable to climate change, environmental degradation and governance fragmentation. Empirical material comprises 22 semi-structured interviews with key tourism-related actors, focusing on governance practices, crisis responses, power asymmetries and institutional capacity.

Results

Findings reveal a persistent mismatch between formal institutional governance arrangements and the socio-environmental realities of the Ebro Delta, where fragmented and ill-suited structures create opening for locally driven forms of governance. Historical abandonment has fostered locally embedded skills and adaptive capacities among local actors, making bottom-up governance dynamics as a primary source of resilience in the Ebro Delta. These practices are neither homogeneous nor conflict-free but emerge through negotiated and contested processes shaped by power relations.

Conclusions

The study contributes to debates on the local turn in tourism governance by showing how community agency and place-based capacities become central where formal governance proves insufficient, reframing resilience as a contingent outcome emerging from empowerment, skills and collective action in peripheral and environmentally vulnerable destinations facing global environmental change.



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C24.17-Geography of Tourism, Leisure, and Global Change => Cryotourism Geographies in the Polycrisis



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1257 - The Tourism Industry's Perceptions Of Permafrost Degradation In The Arctic

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Background

Permafrost degradation is one of the most significant consequences of climate change in the Arctic, with growing impacts on infrastructure, livelihoods, and community well-being. At the same time, tourism has expanded rapidly across Arctic regions and has become an important driver of local and regional development. Despite this, the implications of permafrost degradation for tourism remain largely underexplored. This study examines how tourism stakeholders in the Yukon Territory, Canada, perceive permafrost degradation and its relevance for tourism activities, safety, and long-term sustainability.

Materials and methods

The study draws on semi-structured interviews conducted in June 2025 with tourism entrepreneurs, tourism policymakers, search and rescue personnel, and permafrost experts. Interviews explored participants' experiences with permafrost degradation, perceived impacts on tourism operations and visitor safety, and expectations for the future in a context of intensifying climate change and growing tourism. The material was transcribed and analyzed using content analysis.

Results

Results indicate that permafrost degradation is primarily perceived as an emerging challenge for transportation infrastructure, particularly highways that are critical for tourist mobility, and for the preservation of cultural heritage sites such as Dawson City and Herschel Island. In contrast, participants reported minimal impacts on nature-based tourism and did not associate permafrost degradation with significant direct safety risks for visitors. Permafrost-related impacts were often normalized as part of operating in the North/Arctic and were considered less pressing than more immediate hazards, especially wildfires and flooding.

Conclusions

The study concludes that while permafrost degradation is not yet seen as a critical threat to the Yukon tourism industry, its cumulative and long-term impacts may challenge sites accessibility, may further impact cultural heritage, and erode tourism-dependent community resilience. Integrating permafrost degradation into tourism governance, risk communication, and adaptation planning is therefore essential to support safe tourism and resilient Arctic communities under ongoing rapid environmental and cryospheric change.



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1441 - Melting Glaciers And Tourism Paradoxes In A Warming World

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Glaciers have long played a significant role in tourism, attracting visitors with their aesthetic, scientific, spiritual and recreational value. However, the rapid retreat of glaciers due to climate change is profoundly transforming these relationships. As they melt and disappear, glaciers have become symbols of environmental loss, drawing increasing numbers of visitors who wish to witness these vanishing landscapes before it is 'too late'. This presentation will examine the paradoxes that are emerging at the intersection of glacier tourism, climate change and adaptation, and will explore the social, environmental and political implications of these issues.

We argue that contemporary glacier tourism is shaped by a set of intertwined contradictions. On the one hand, glaciers are increasingly being used as locations for last-chance tourism and ecological mourning, where visitors seek an emotional connection and a sense of purpose in the face of global loss. Activities such as commemorations and 'glacier funerals' demonstrate how glaciers have become subjects of mourning and collective contemplation, occasionally promoting environmental awareness and political action. Conversely, local tourism systems often respond to glacier retreat with short-term technical adaptations, such as geotextile covers, snowfarming, new infrastructure or helicopter access, which aim to maintain visitor numbers and economic viability. However, these measures can intensify environmental pressures, increase emissions and delay deeper transformations, thereby risking maladaptation.

The presentation also emphasises the uneven distribution of costs and benefits associated with glacier tourism. Although glaciers are global icons that can catalyse climate action and policy change, local communities often suffer the consequences of glacier loss, including increased hazards, water insecurity and unstable tourism economies. Meanwhile, profits may accrue to external actors while structural vulnerabilities remain insufficiently addressed.

In conclusion, we identify key research priorities for glacier tourism in a warming world. These include critically assessing adaptation strategies and their implications for justice, improving our understanding of the processes of ecological grief and commemoration in tourism contexts, and preparing for post-glacial futures through the anticipatory governance of deglaciated landscapes. Together, these perspectives encourage a shift away from short-term solutions towards more transformative and equitable approaches to tourism in rapidly changing cryospheric environments.



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1498 - A Geobibliography Of Ski Tourism And Climate Change

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Ski tourism and recreation is a significant contributor to regional economic development and societal wellbeing. Today, ski areas are spread out all over the cryosphere, generating economic growth and employment. Yet skiing experiences the impacts of global warming in the harshest way, while also driving climate change through its own carbon emissions. Such duality requires skiing to engage in both the adaptation and the mitigation aspects of SDG 13 - Climate Action, making skiing and the climate crisis a hot topic on the research agendas. In this study, we provide a comprehensive literature survey on the subject, reviewing more than 800 studies. These studies are then analyzed in terms of their themes relevant to tourism and climate and further mapped according to their study areas. The resulting layer is overlaid with ski geographies, consisting of existing and potential areas and demand origins. This step helps show the spatial research gaps. Moreover, space time pattern mining techniques are also employed to determine regions where new research is needed. Overall results are gathered on a Web GIS, i.e. a 'geobibliography', where the users can filter the studies thematically and interact in 2D, 3D and virtual reality environments. Last but not least, application of GeoAI is discussed in terms of its potential to predict future research avenues.



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2313 - The Harbin International Ice And Snow Festival A Benchmark For Artificial Cryotourism Sites In The Context Of Climate Change

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The Harbin International Ice and Snow Festival in China is recognized as a global reference in cryotourism, transforming extreme winter conditions into a key driver of urban and regional development. Originating from local ice lantern traditions, the festival has evolved into a large-scale international event attracting millions of visitors each year and contributing to the revitalization of former industrial territories in Northeast China. The festival is situated within a broader global geography of snow and ice festivals, allowing for a comparative perspective on the circulation of models, practices, and representations of winter tourism worldwide. However, its model is increasingly challenged by climate change, which threatens the availability and reliability of ice and snow resources.

This communication examines the role of the Harbin International Ice and Snow Festival within broader ice and snow tourism strategies and national policy frameworks, particularly China's Northeast Revitalization Plan. The analysis is further extended through a comparison with other Chinese ice-related sites, including the Shougang district in Beijing, a former industrial area reconverted into a hub for ice sports and winter leisure activities after the Beijing Winter Olympic Games.

By highlighting the paradoxes of cryotourism in a warming climate, this research shows how a destination built around a temporary and climate-dependent event faces a dual challenge: increasing climate risks that threaten its long-term viability, and strong tourist demand that simultaneously drives economic growth and intensifies environmental pressures. The Harbin case provides broader insights into the future of winter tourism destinations confronting climate uncertainty.



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2521 - 'ice End' A Game Based Approach To Glacier Tourism And Climate Change Adaptation

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Glacier tourism destinations are increasingly affected by climate change, with glacier retreat, evolving risk conditions, and growing uncertainty challenging tourism development and local livelihoods. These challenges call for integrative and collaborative approaches that foster understanding of complex socio-environmental systems and enable informed discussions on sustainable adaptation, carbon risks, and land-use conflicts. Against this background, this presentation examines the development of a game-based approach in the context of glacier tourism and climate change adaptation. Game-based simulations have emerged as a valuable tool in research and education, offering a playful and integrative way to stimulate dialogue and facilitate knowledge co-creation. A game-based approach combines scientific information with interactive, scenario-based learning, allowing participants to explore adaptation options, stakeholder perspectives, and trade-offs associated with glacier change. Building on an interdisciplinary collaboration including anthropologists, tourismologists, geographers, geophysicists and glaciologists, we developed a game prototype designed to foster dialogue around glacier tourism issues. In doing so, we contribute to the advancement of creative, game-based methods as educational tools for engaging with complex social-ecological challenges. The prototype takes the form of a board game in which participants are invited to construct their own game board using freely downloadable materials and guided instructions developed by the research team. In the context of glacier tourism adaptation, we contend that game-based approaches thus function not only as pedagogical tools but also as arenas for transformative learning, enabling stakeholders to reframe problem understandings, challenge existing assumptions, and explore emergent adaptation pathways. We conclude the presentation by reflecting on our experiences and the key lessons learned from developing and playing the game.



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2638 - Towards A Climate Resilient Ski Tourism Development In Erzurum Türkiye

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Türkiye's northeastern province of Erzurum has for decades been an attractive region for snow sports and tourism, with new investments and mega events setting its recent agenda. Moreover, our recent research shows that the destination's future snow reliability is relatively promising and its capacity to adapt to the impacts of climate change is also strong. That being said, a comprehensive understanding of how ski tourism will face the climate crisis is still needed, as the previous studies have mostly focused on vulnerability assessments, without much emphasis on the climate resilient development (CRD) laid forth by the Intergovernmental Panel on Climate Change (IPCC) to promote a holistic engagement with climate action that acknowledges both the climate and the carbon risks of tourism. In this study, we depart from a project that pursued a participatory and multimethod approach during 2018-2021, firstly, to understand the state of ski tourism and climate change in the region, and then, to co-produce an adaptation roadmap. In 2026, we ran a follow-up study through climate and document analyses and interviews with the key stakeholders to reveal the progress with adaptation and to seek for any initiatives towards a climate resilient ski tourism development that responds to the climate crisis with integrated adaptation and mitigation efforts. Our findings show that whilst the destination capitalizes on its relative snow reliability and further invests into adaptation, such progress occurs within a defragmented destination governance framework, and a mitigation discourse remains limited with systemic and locational challenges.



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C24.17-Geography of Tourism, Leisure, and Global Change => Degrowth in Tourism: Rethinking Mobilities Amidst a Changing Climate



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1132 - A Biopolitical Reading Of Overtourism Mitigation Politics And An Exemplary Case The “access Fee” To Venice

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Background

A widening number and range of destinations around the world faces situations of overtourism, loosely defined as a socially constructed perception of facing an excess of tourists. Reactions to overtourism seem to be aligning globally, into manifestations of discontent that have been frequently tagged as ‘anti-touristic’ by the mainstream polity and media. Especially in tourism hotspots where the ‘crisis by (over)tourism’ has been aggravated by other critical change processes, or polycrises – such discontent has risen into constituencies that actually managed to take action against the reproduction of those very growth models, however patchy, untimely and contested such initiatives appear to be.

Materials and methods

In this contribution we develop an account of the formation and discursivization of overtourism and its most evident manifestations framing it in biopolitics, an emerging epistemological apparatus in tourist studies that examines the way in which power is played out on populations and space production in the formation and management of tourist places. This approach complements examinations founded in political economy with a closer analysis of the reproduction of power relations through subjectification and legitimation, control over the bodily practices and spaces of individual and collective freedom, and the social ordering of mobility and access.

Results and conclusions

The case of Venice is perhaps the most outstanding example of a whole city governed as a tourist attraction through the recent introduction of a tool that intentionally stratifies its ‘customers’, but so doing being mirrored by a re-legitimation of the ‘locals’ and their rights to their livelihoods, while it only superficially tackles the structural roots of its overtouristic crisis. This contribution thus challenges the ‘actually implemented’ politics of tourism degrowth at local level as part of a wider entrenchment of a governmental shift towards the biopoliticization of tourist mobilities and the reproduction of tourist places as living communities.



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1174 - Exploring Degrowth In Marine And Coastal Tourism Perspectives Of Socio Ecological Stakeholders In Semporna Malaysia

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Marine and coastal tourism is among the fastest-growing segments of the global tourism industry; yet it is increasingly questioned for its socio-ecological impacts. Shaped by a neoliberal capitalist model that prioritises economic growth over ecological integrity and social well-being, tourism development often produces overcrowding, resource depletion, habitat destruction, increasing travel emissions and widening socio-economic inequalities at destinations. In response, de-growth has emerged as an approach that calls for a deliberate reduction and restructuring of economic activities to restore ecological balance and support local livelihoods under post-humanist perspectives. However, degrowth strategies may destabilise tourism-dependent communities, particularly in the Global South, where social complexities make these countries more vulnerable. This makes local context crucial for understanding how degrowth can be implemented in ways that distribute benefits and burdens equitably among communities, tourism operators and ecosystems.

This research explores the feasibility of tourism degrowth in Semporna (Sabah, Malaysia), a renowned dive and island-hopping destination where rapid expansion has contributed to coral bleaching, anchor damage and marine debris, while sharpening inequalities across ethnic groups, including population living with precarious legal status. Using semi-structured interviews and focus groups with community members, tourism operators, public administrations, and conservation organisations, this study examines context-specific degrowth pathways that could mitigate ecological pressures while also reducing social inequalities. Emphasising community resources and locally defined needs, it foregrounds decision-making that reflects diverse viewpoints within the broader socio-ecological system.

Preliminary analysis indicates broad recognition of ecological and social limits and the need for a transformative approach. However, there is a sharp divergence over what is feasible, particularly due to widespread perception of corrupt governance structures that bend to economic interests at the expense of society and environment, fueling distrust and a growing sense of a foreclosed future.



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1752 - Reimagining Urban Tourism Post Growth Policy Transitions In London

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Tourism is widely regarded as a key driver of economic growth; however, evidence shows that excessive tourism can have adverse effects on the broader dimensions of social, environmental, and economic justice (Milano et al., 2019). In response to these challenges, new post-growth approaches to tourism development have been advanced as valuable alternatives to conventional growth-oriented policy perspectives, which continue to frame economic expansion as a prerequisite for sustainable development (Fletcher et al., 2019; Higgins-Desbiolles et al., 2019). Yet, despite growing interest in these debates from a conceptual perspective, limited empirical understanding of how postgrowth ideas are interpreted, operationalised, and contested within tourism policy and governance, particularly in urban contexts. This paper therefore examines how transformative approaches to tourism development - including degrowth, postgrowth, and regenerative tourism - are being incorporated into urban tourism policy, using London as a case study. As a global city with extensive tourism-related mobilities and strong climate ambitions, London offers a great context in which to explore tensions between growth-oriented tourism strategies, climate commitments, and local wellbeing. The research asks: to what extent do urban tourism policies move beyond growth-based logics, how are alternative success measures articulated, and what barriers constrain the adoption of postgrowth-oriented approaches?

To achieve its objectives, the study combines thematic analysis of tourism and urban policy documents with semi-structured interviews with key stakeholders involved in tourism governance, including policymakers, destination organisations, and community actors. Through the application of postgrowth debates to policy practice, the paper contributes empirically to discussions within degrowth literature, as well as sustainable tourism policy debates, while offering insights into the governance challenges of transforming tourism mobilities. This case study is part of a wider project involving several other European cities, including Amsterdam, Venice, Copenhagen among others.



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2411 - Climate Change Risks And Tourism Development On The Arabian Peninsula

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Globally tourist destinations are extremely dependent on the quality of environmental resources, favourable weather conditions and resilient communities. The Arabian Peninsula has been experiencing the impacts of accelerated climate change, manifesting through increased flooding, storms and extreme heat in the past decade. These environmental challenges pose threats to the region and its local communities. Despite these climate related impacts and continuous risks, the Arabian Peninsula has seen a rapid expansion of its tourism infrastructure in the past years. This growth has given rise to a trend of 'enclosed tourist bubbles' and global transportation hubs on land, in the air, and at sea. I refer in particular to developments in the aviation sector, space travel and mega-cruise tourism, contributing significantly to carbon emissions in the Gulf Cooperation Council (GCC). My research is informed by personal, lived experiences, qualitative research conducted with local government stakeholders in The Sultanate of Oman, and a thorough examination of tourism policy documents in the GCC. Based on these insights, I argue that it is necessary to shift towards tourism models that are slower, locally focused, community-driven, and centered around religious values. Such regenerative tourism initiatives are essential for creating valuable, long-term changes in the development of tourism in the GCC region.



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2416 - Could The Decline Of The Size Of Ski Resorts In The French Alps Be Part Of A Degrowth Strategy

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Alpine skiing has long been a growth driver for many mountain regions that specialise in winter tourism, and it remains a significant pillar of economic dynamism today. However, these areas are increasingly facing various constraints, whether climatic, economic or relating to local issues of social equity and governance. These challenges call into question the viability of a tourism model that is struggling to reinvent itself. In response, adaptive strategies are gradually emerging, aiming to improve the liveability of these areas, ensure the sustainability of ski area operations and prepare for the end of skiing, depending on the context.

The trend of reducing ski facilities in Alpine resorts — the strategy adopted by some operators to remove ski lift equipment in response to economic difficulties — has become increasingly common in the French mountains in recent years. It strikes a balance between enhancing production capacity through technical solutions and complete closure. However, the motivations behind these decisions and how they fit into a sustainable framework have so far received little analysis.

Our contribution analyses the trajectory of decommissioning through the lens of the concept of degrowth. The central question is whether these changes are merely an expression of economic decline or if they form part of a genuine degrowth strategy adopted by operators. First, this contribution documents the reduction in skiing provision identified in 18 French ski areas. It also analyses the underlying motivations for this reduction and their link to degrowth.

In this regard, we demonstrate that, although some processes associated with reduction resemble certain aspects of degrowth, it often remains a forced decline. However, the reduction of the Métabief ski area in the Jura Mountains in winter 2024–25 illustrates how opportunities can arise from an apparent decline in skiing activity to organise a transitional tourism strategy and achieve sustainable territorial degrowth.



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2561 - Understanding Mobility As A Universal Basic Service A Lever For Radical Transformation In The Tourism Sector

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In this contribution, we aim to build a bridge between the debates and advancements in the tourism degrowth literature and the field of mobility degrowth. While tourism degrowth rarely assesses the entire tourism value chain and mostly disregards transport, it offers important debates towards the development of more sustainable forms of proximity tourism (Ballantine, 2020). Particularly noteworthy is the critique of the UNWTO's construction of a supposedly universal "right to tourism" that in practice privileges the few, contrasted with an alternative formulation of a "right to leisure and mobility" for the many, one grounded in principles of inclusivity and equity rather than financial means (Higgins-Desbiolles et al., 2019). Mobility degrowth scholarship conceptualizes mobility as a fundamental social need that must be met within ecological limits (Dillman et al., 2021). This framing shifts attention away from maximizing transport volumes and technological throughput toward questions of universal access, sufficiency, social justice, and public or commons-based provisioning (Cattaneo et al., 2022).

By bringing these debates into conversation, we seek to prompt a radical rethinking of tourism and mobility. In doing so, we raise the seemingly paradoxical question of whether universal access to mobility and its understanding as a universal basic service can serve as a transformative pathway toward genuinely sustainable tourism practices? The rejection of the right to tourism and the resulting conceptualization of the right to leisure, which should entail the right to mobility, forms the basis for understanding mobility as a basic public service, thereby enabling resource-efficient and socially inclusive proximity tourism. By combining different strands of degrowth research that have not previously been considered together, we aim to develop practical recommendations for action. We believe that advancing the spatial conceptualization of the right to mobility might be a starting point to develop degrowth mobility practices into radical politics.



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2650 - Pro Growth Futures And Degrowth Critiques Sustainability Discourses In A Contested Airport Development Project

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Degrowth represents a fundamental shift away from growth as the dominant development paradigm, reframing sustainability debates in light of global ecological challenges. While degrowth may appear utopian within current economic and political structures, it nevertheless prompts a necessary discussion about societal transformations required to address ecological limits in the Anthropocene. An increasing body of scholarship calls for strong sustainability approaches and alternative paradigms to counter prevailing pro-growth discourses. Within tourism studies, air transport is particularly contested, as many scholars argue that meaningful reductions in carbon emissions, and tourism's contribution to global warming, are unlikely without reducing non-essential air travel and, consequently, tourism growth.

This study analyses public discourses surrounding the development of a new airport near a major ski resort in rural Sweden. The project was highly controversial, with proponents and opponents expressing conflicting interests and perspectives. To capture these debates, newspaper articles published between 2008 and 2020 were analysed.

The findings reveal two opposing discursive perspectives on future development. The dominant discourse frames growth as a pathway to a prosperous and hopeful future, justifying the investment through anticipated increases in tourism, employment, and economic development aimed at counteracting regional peripherality. Environmental impacts, particularly climate-related concerns, were acknowledged but largely framed as manageable through technological innovation.

In contrast, a critical discourse challenged the project by questioning perpetual economic growth and existing power structures. These voices argued that the airport primarily served corporate interests at the expense of local communities. Overall, the analysis suggests that the destination is locked-in a pro-growth development model favouring revitalisation through internationalisation and large-scale infrastructure projects.



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C24.17-Geography of Tourism, Leisure, and Global Change => Emerging Geographies of Tourism in the Asia-Pacific Amidst Crisis, Conflict and Stasis



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1229 - Infrastructure Tourism Mobilities And Socio Material Assemblages The Impact Of The Laos–china Railway On Vang Vieng Laos

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-Background: Tourism infrastructure is widely recognised as an important driver of tourism development, particularly in developing countries such as Laos, where tourism is a pillar of the national economy. State-led transportation projects not only improve accessibility but also reshape tourism mobilities and the spatial organisation of tourist destinations. This study conceptualises tourism infrastructure not merely as a transport facility but as a socio-material assemblage through which tourist mobilities, destination space, and tourism practices are continuously reconfigured. Drawing on ethnographic research, this study examines how the completion of the Laos–China Railway (LCR) under China’s Belt and Road Initiative has transformed Vang Vieng, a town previously constituted as a backpacker-oriented tourism destination.

-Materials and methods: The study draws on documentary analysis of tourism policies and statistical data to understand the broader development context, combined with qualitative fieldwork conducted in Vang Vieng in February 2025, including semi-structured interviews with tourism stakeholders and participant observation.

-Results: The findings show that the opening of the LCR has accelerated and intensified tourism mobilities by increasing visitor numbers and enabling the influx of new tourist segments from neighbouring countries, particularly Chinese tourists travelling via the LCR. These changes are not linear but multi-directional and dynamic, involving the movement of people, services, and tourism-related activities. As a result, the tourism space in Vang Vieng has been restructured. Facilities and services originally oriented towards backpackers have been repurposed or expanded to serve mass tourism, including rapidly growing Chinese visitor segments, while backpacker spaces have become more spatially concentrated rather than disappearing. The railway has also facilitated the convergence of diverse tourist segments and tourism infrastructures, placing the destination in a process of ongoing transformation.

-Conclusion: This study suggests that analysing transport infrastructure as a socio-material assemblage offers important theoretical and policy insights into how infrastructure-led development reshapes tourism mobilities and destination space in emerging tourism areas.



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1756 - Reimagining Tourism In The Context Of Geopolitical Tensions At Highly Touristified Areas Residents' Perspectives From Kyoto Japan

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In response to growing concerns about overtourism and rising tensions between residents and tourists, tourism research has increasingly called for attention to local residents' perspectives on how tourism might be reimagined by residents (Cheer & Mostafanezhad, 2025; Gillen, 2025). In parallel, there is growing interest in conceptualising tourism imaginaries in Asian destinations (Lovell & Sharma, 2025). A key challenge in this debate lies in understanding how residents themselves conceptualise desirable forms of tourism and tourism governance. This conference presentation addresses this challenge by examining resident-articulated imaginaries of tourism in Kyoto, Japan.

As one of Japan's most prominent heritage tourism destinations, Kyoto is economically dependent on tourism, while residents increasingly experience tourism as a disruption (Prough, 2022; Schmidt et al., 2025). Most recently, diplomatic tensions between Japan and China have been accompanied by travel advisories issued by the Chinese government and a sharp decline in visitor arrivals from mainland China, from previously stable double-digit growth to around 3%. This development is particularly significant for Kyoto, given the economic importance of Chinese visitors as one of the largest and highest-spending visitor groups (Niki & Ishikawa, 2025).

The presentation is structured in four parts. First, it provides an overview of tourism governance and adaptation practices implemented by the city of Kyoto, with particular attention to approaches emerging from resident activities. Second, building on previous research with residents in Kyoto and neighbouring cities, it examines how residents differentiate between "tourists" and "tourism" in their experiences at heritage sites (Schmidt et al., manuscript under revision). Third, it explores initial empirical insights into how residents imagine changes to tourism management. Across these materials, residents rarely reject tourism outright, but instead articulate differentiated perspectives on tourists and tourism, often accompanied by calls for more effective governance and forms of cultural tourism that support local practices. Finally, the presentation concludes with an outlook on future research directions, focusing on the transferability of resident-articulated tourism imaginaries across.



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1995 - The Materiality Of Responsibility An Actor Network Perspective On Birdwatching Tourism

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Responsible tourism mitigates the adverse impacts of tourism activities and improves sustainable development of tourist destinations. However, existing studies largely frame tourists' environmental responsibility as a product of socio-psychological factors, neglecting the role of non-human actors. Taking birdwatching tourism as a case study, this research adopts Actor-Network Theory to conduct a symmetrical analysis of the formation mechanism underlying tourists' environmental responsibility, drawing on in-depth interviews with 26 participants in China. The findings indicate that birdwatchers' environmental responsibility is constructed within a heterogeneous actor network and evolves through a dynamic three-stage process. First, optical instrument actors, spatial actors, birdwatchers, and avian actors jointly form an observation network, which underpins the development of birdwatchers' sensory cognition of avifauna. Second, avian actors emerge as core nodes in the network and enroll birdwatchers through their embodied attributes, driving the evolution of the observation network into a fascination network. In this network, interactions among diverse actors foster and deepen the emotional bonds between birdwatchers and birds, thereby shaping the former's sense of responsibility toward the latter. Nevertheless, the emotions cultivated in this network may potentially induce inappropriate and bird-detrimental behaviors, such as luring birds for more photogenic shots. Third, knowledge actors join the network and rectify such inappropriate behaviors by disseminating avian science and conservation knowledge, which further shapes birdwatchers' responsible environmental awareness and behavioral patterns, and facilitates the evolution of the fascination network into a conservation network. This study enriches the theoretical framework and empirical evidence in the field of responsible tourism, and offers practical insights for the sustainable development of birdwatching tourism globally.



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2583 - How Culture Shapes Tourist Behavior Through Cultural Schemas□case Of Jiangnan Culture

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In the context of culture shaping tourism, existing studies have largely focused on differences in tourist behavior and their driving factors, while the guiding role of region-specific cultures in promoting behavioral convergence among tourists remains underexplored. Drawing on a cultural schema perspective, this study takes Suzhou as a case and employs TopicGPT analysis combined with qualitative text coding to investigate the mechanisms through which Jiangnan culture shapes tourist behavior. The results show that: (1) Jiangnan cultural schemas are holistic and socially shared. When tourists encounter cultural settings, these schemas are automatically activated, enabling the completion of cultural scenes through default assumptions and the pre-selection of behavioral possibilities prior to action, thereby producing culturally consistent behaviors; (2) cultural schemas influence tourist behavior through multi-layered pathways—guiding scene interpretation at the initial stage of visitation, maintaining behavioral coordination through implicit categorization and rhythm adjustment during the experience, and, at deeper experiential stages, embedding cultural scripts into embodied practices, emotional resonance, and immersive experiences, thus facilitating cultural reproduction; (3) the effects of cultural schemas are conditioned by environmental accessibility, the appropriateness of cultural expression, and contextual applicability. High levels of congruence strengthen the guiding role of cultural scripts, whereas under low congruence tourists adjust their visitation strategies through personal schemas; (4) personal schemas play a moderating role in the operation of cultural schemas by selectively activating and situationally adapting them, allowing individual variation to emerge within overall behavioral convergence. This study clarifies the generative mechanisms of tourist behavior under the influence of cultural schemas and provides theoretical insights for tourism behavior research and destination cultural presentation.



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2601 - The Evolution Of Destination Tourism Supply Chains Under Digital Technologies A Longitudinal Single Case Study From A Digital Ecosystem Perspective

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As digital technologies shift from auxiliary tools to core production factors, the organizational forms and governance logics of tourism supply chains are being profoundly reconfigured. Existing research has noted the disintermediation effects of digitalization and the early contours of smart tourism ecosystems, yet it has largely emphasized instrumental, technology-enabled improvements or shifts in relationships among human actors (e.g., suppliers, intermediaries, and consumers). Drawing on a digital ecosystem perspective, this study investigates the evolution of the group-tour supply chain in Zhangjiajie, China through a longitudinal single-case design, integrating documentary materials and fieldwork data from 2011 to 2025. We examine how digital technologies—by reshaping information flows, transaction rules, and collaboration patterns—operate as a core force that transforms both the organizational configuration and the modes of social embeddedness of the supply chain, driving a shift from a linear chain toward a platformized digital ecosystem.

The findings reveal three major transitions: (1) the destination supply chain has evolved from socially embedded linear provision, to networked channels enabled by technological intervention, and further to an algorithm-driven hub-and-spoke digital ecosystem; (2) the mechanisms enabling collaboration have fundamentally changed: trust formation has shifted from long-term relational (guanxi-based) trust to data- and algorithm-backed system trust; value logics have moved from information-asymmetry-based channel dominance and deferred reciprocity to traffic-matching-based value co-creation and near-instant settlement; and power has been reallocated from travel agencies' resource dominance to algorithmic discipline imposed by digital platforms; and (3) in the current hub-and-spoke ecosystem phase, supply and demand nodes have become increasingly fragmented, and matching is progressively decoupled from temporal and spatial constraints. Under this configuration, low-price competition has shifted from strategies rooted in informational monopolies to traffic leverage strategies aligned with platform distribution mechanisms.

Beyond documenting techno-social change, this study demonstrates how digital technologies, as nonhuman actors, enact latent governance and redistribute power through their material properties and institutionalized rules, offering an explanatory framework for industrial transformation in the digital economy.



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C24.17-Geography of Tourism, Leisure, and Global Change => Geographies of Heritage Tourism



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1038 - Spectral Authenticity And Interpretation Of Asylum Heritage An Uneasy Relationship

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The contested nature and lack of commemoration of asylum heritage through tourism have rarely been examined. The Crichton Royal Institution (CRI) in southwest Scotland operated as an asylum between 1838 and 2013, pioneering an internationally recognised system of creative therapy. Yet, the commodification and interpretation of asylum heritage of those operating small-scale ‘ghost’ tours on site are developed as commercial entertainment with some educational elements.

Using a qualitative research approach including participant observations of the Crichton heritage tours and semi-structured interviews with key stakeholders who are directly or indirectly involved in the Crichton heritage interpretation and development, this paper examines the managerial challenges associated with perceptions of authenticity and spectrality in the context of asylum tourism. It asks:

- How is authenticity experienced in a ghost tour at the Crichton in relation to the spectral?
- How is authenticity conceptualised by tourism suppliers operating within the re-enactment of the past shaped by spectrality?
- In what ways do they perceive, perform, and enact the “real” within such environments?

The paper first investigates how different models and dimensions of authenticity are applied within asylum-related tourism experiences. It then offers new perspectives for understanding the role of authenticity and spectrality in asylum sites as spaces of both heritage tourism and socio-political education. Finally, the paper raises the question of whether, and to what extent, the historical re-enactment or representation of displacement, confinement, and suffering can foster meaningful experiences for visitors engaging with asylum tourism.

This research contributes to ongoing debates in authenticity, heritage interpretation and re-enactment events, offering new perspectives on how performances, embodied experiences and spectral elements contribute to the production of authenticity in asylum heritage settings.



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1100 - Research On Route Selection Of Historical And Cultural Greenways From The Perspective Of Regional Heritage Spatial Network

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Jinzhong City, a heritage-rich region in Shanxi, China, boasts abundant cultural relics, traditional villages, and diverse cultural landscapes, but faces fragmented “island-like” heritage distribution and unsystematic linear space planning, which hinders integrated development of cultural protection, ecological conservation, and sustainable tourism. This study hypothesizes that a culture-oriented and objectively quantified route selection method can effectively connect scattered heritage sites, balance multi-dimensional demands, and realize networked heritage protection with enhanced tourism accessibility. Taking Jinzhong as the case study, 12 key resistance factors were systematically screened across four dimensions: cultural heritage, ecological suitability, spatial structure, and urban construction. Principal Component Analysis (PCA) was used to objectively determine factor weights, eliminating subjective biases, and a GIS-based comprehensive cost surface was constructed. With 11 county central urban areas as “source points” and 370 high-value heritage/ecological nodes as “sink points”, potential routes were generated and optimized via the Minimum Cumulative Resistance (MCR) model. The results show that six core factors (heritage network, land use, population density, elevation, water systems, historical routes) accounted for over 70% of total weights; Jinzhong’s comprehensive resistance surface showed a “high southeast, low northwest” pattern, with the northwest (resistance 4.44-5.75) as the core suitable area—boasting 21.6% of the area within 500m of national/provincial highways, 22.2% with $\geq 13,130$ heritage sites/km², and 75.6% with $\geq 70\%$ vegetation coverage—reducing construction cost by 29.5% compared to the southeast (resistance ≥ 6.82). The optimized “Three Belts and Four Districts” scheme connected 93% of national key cultural relics, with 68% reuse of existing roads and 67% route overlap among six plain counties. The PCA-MCR integrated method effectively addresses the limitations of traditional subjective weight assignment and disjointed route selection, and the “Three Belts and Four Districts” scheme provides a quantifiable, operable path for networked heritage protection and sustainable tourism, which is replicable for regions with abundant heritage and significant topographical differences, enriching geographies of heritage tourism research with practical insights.



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1362 - Governing Heritage Tourism In Practice Legal Complexities And Institutional Challenges In Yunnan China

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Set against the backdrop of heritage tourism development in Yunnan Province, China, this study examines the practical functioning of the country's complex legislative framework governing heritage tourism.

Adopting a legal-analytical approach, the research focuses on three representative sites—the Old Town of Lijiang, the Shilin area of the South China Karst, and the ShizhaiShan National Archaeological Site Park. The study aims to clarify the roles of relevant authorities throughout the entire process of heritage tourism development, from heritage protection to tourism operations. In addition, to understand the government's developmental orientation, a series of policies and regulations issued in recent years will be analyzed.

Two key issues are identified in the study. First, at the legislative level, at least three independent authorities are involved. The absence of centralized oversight for both protection and tourism operations leads to divergent institutional priorities. In the case of Yunnan, the implementation of heritage tourism policies relies heavily on regional governments and individual sites, resulting in fragmented and discretionary enforcement. Second, although recent administrative efforts have promoted the integration of the cultural and tourism sectors, many of these initiatives remain incentive-based and depend on voluntary participation. As such, the issue of fragmented governance remains unresolved. The study highlights the need for a more coherent institutional structure and stronger legal mechanisms to ensure the sustainable development of heritage tourism in China.



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1543 - Digital Translation Typologies And Public Understanding Pathways In Architectural Heritage Tourism A Comparative Study Of 60 Cases

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Compared with traditional heritage tourism centred on on-site visits, digital media have increasingly become a key channel through which the public encounters and understands heritage. Cognitive theory suggests that heritage meaning is not fully acquired at once but emerges through interconnected processes of understanding, media translation, and feedback. However, how different digital translation strategies shape public understanding and sustained attraction within heritage tourism remains insufficiently examined through systematic comparison.

To address this gap, this study examines digital interactive projects related to architectural heritage through a meaning-making framework structured around understanding, translation, and feedback. A comparative database of 60 cases and 29 design and narrative variables was constructed. Multiple Correspondence Analysis (MCA) and cluster analysis were applied to identify 7 typologies of digital translation strategies. These typologies were further examined using social media metrics, including exposure, reach, interaction, communicative evolution, and evaluative feedback, to assess their differentiated performance within heritage tourism contexts. The results indicate that most projects adopt mass-oriented strategies focused on emotional experience and narrative consumption, which are effective in generating initial interest but less capable of sustaining long-term engagement. In contrast, strategies emphasising spatial structure exploration, long-term participation, and knowledge construction, though less prevalent, demonstrate greater potential for communicative persistence and sustained heritage tourism visibility.

This study conceptualises digital interaction not merely as an auxiliary display tool for heritage tourism, but as a geographical mediator shaping the spatio-temporal pathways through which the public understands heritage and influencing its visibility, interpretability, and long-term attractiveness within tourism systems. From a heritage tourism geography perspective, this research proposes an operational analytical framework for comparing digital heritage translation strategies, offering theoretical and methodological implications for the design and communication of digital heritage tourism experiences.



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1561 - Reinventing Historic Urban Landscapes As Photographic Scenes Aesthetics Governance And Social Media Cultures In China

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Existing scholarship has examined how historic urban landscapes (HULs) are represented through social media. However, the processes and mechanisms through which these HULs are actively reinvented through the specific aesthetic norms and logics that dominate social media require more critical investigation. This study advances this line of inquiry by investigating the dynamic interplay between state entrepreneurialism, social media cultures, and consumerist lifestyles in transforming HULs as digitally consumable scenic assets.

Employing a mixed-methods approach that integrates online data analysis with onsite observations, this research reveals that entrepreneurial local states, sometimes acting through market instruments, are proactively reinventing HULs in China. Their strategies preferably align HULs with prevailing aesthetic norms such as the Instagrammable, the minimalist, or the nostalgically chic to enhance place recognition and competitive attractiveness within the digital economy.

Meanwhile, social media users become key participants in this reinvention, though their involvement produces uneven outcomes. Digital visibility and influence are unevenly distributed, often amplifying curated narratives that prioritise photographic appeal over historical depth or socio-cultural complexity. Common practices such as sharing geotagged check-in guides, posting curated photographs, and selecting aestheticised scenes were not done to show appreciation of HULs; rather, they were done to amplify consumerist tastes and lifestyles.

This research, thus, contributes a critically nuanced perspective to heritage tourism and urban aesthetisation in the digital age. It elucidates how social media platforms do not neutrally mediate but fundamentally facilitate a new regime of aesthetic governance. This regime is characterised by a convergence of state entrepreneurialism, heritage commodification, and consumerism, which together transform HULs into staged photographic scenes for online circulation, production, and consumption.



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1729 - Polyphony Of Nature Value Production And Interpretation Mechanism Of Mountain Type World Heritage Site

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Mountain-type World Heritage Sites embody the complexity of multiple narratives intertwining history and locality, culture and nature, and thus urgently demand a multi-subject, decentralized logic to interpret their pluralistic values. Drawing on polyphonic theory spanning musicology and literary studies, this research takes the World Heritage Site of Mount Lu, China, as a case study. Based on historical records and fieldwork, it explores the multi-agent construction and multi-threaded narrative logic underlying the production of its heritage value. Grounded in the multi-scale discourse and multi-level value spectrum across the global-national-local continuum, this study clarifies the objectives of value articulation, probes the coupling mechanism between value interpretation and the deep integration and transformation of cultural tourism, and proposes diverse paths and models for creative transformation. The study finds that: 1) The production of Mount Lu's heritage value encompasses four interwoven dimensions: an artistic and romanticized representation embedded in traditional cultural contexts, a sanctified and idealized schema shaped by ancient religious discourses, the deep embedding of modern foreign cultures and capital, and the socio-ecological construction under contemporary multi-stakeholder certifications. This manifests a polyphonic logic characterized by the parallel interweaving of subjectivity and equality across diverse cultural systems. 2) The systematic and dynamic interpretation of Mount Lu's multi-dimensional value system not only shapes the identification of existing values but also underpins the assessment of value persistence and the emergence of new values, thereby serving as a critical basis for the articulation of heritage values. 3) The articulation of heritage values should be underpinned by open dialogue, emphasis on the value of critical reflection, and adherence to the principle of individual equality—guiding polyphonic reflection on the current monolithic narrative discourse model of mountain-type World Heritage Sites. Concurrently, grounded in the contextualized discourses of multiple stakeholders, this process must respond to multi-level goal demands spanning the global, national, and local scales, account for the coordination and trade-offs of value objectives across different levels and actors, and thus conduct polyphonic elaboration of narrative discourses from a multi-dimensional perspective.



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1808 - Differences In Communist Museums And Their Historical Background In Terms Of Dark Tourism

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Tourism of socialist-era relics and museums is popular in former socialist countries. I have investigated numerous communist museums in these countries. While the names of these museums are similar, their contents vary significantly from country to country due to their historical and social backgrounds.

In this report, I will examine the historical background behind the significant differences in exhibit content, focusing on the Polish museum of socialism and the Hungarian House of Terror.

The Polish museum of socialism is called Museum of Life under Communism which dominated by life-related exhibits, exuding a somewhat idyllic atmosphere.

On the other hand, the Hungarian Museum of Communism, as its name “House of Terror” suggests, conveys the serious human rights violations of the socialist era.

What is the origin of this difference? As satellite states of the Soviet Union, both countries belonged to the socialist camp after World War II, and the socialist system collapsed at roughly the same time. However, Poland is characterized by its inherent anti-Russian tendencies, the presence of intermittent resistance movements even during the socialist era, and the full-scale implementation of political reforms through Solidarity since the 1980s. In contrast, a clear lineage can be discerned in Hungary from pro-Nazi activities to postwar Communist rule. Furthermore, during the one-party Communist dictatorship, many political prisoners were arrested and killed. This number is incomparable to that of Poland, and the horror of this loss is still vividly handed down among the Hungarian people.

In other words, even if the name is the same “Communist Museum,” its substance is based on historical context, and the exhibits it displays will naturally differ depending on the social background. In this report, I hope to logically demonstrate this obvious logic, using concrete examples.



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1876 - China's Intangible Cultural Heritage And Its Approach To Conservation And Tourism A Study Of Two Museums In Beijing

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In recent years, China's Ministry of Culture and Tourism identified Intangible Cultural Heritage (ICR) as a key area of development. Among the many measures is the establishment of grand ICR-oriented museums or cultural centres in Beijing and elsewhere in the southern part of the country. As the capital, Beijing's approach to ICR conservation and tourism development will serve as an exemplary model for the country. This paper examines recent ICR-related policies and developments and evaluates two ICR museums: the China National Arts and Crafts Museum (est. 2022) and the Beijing Eight Imperial Handicrafts Museum (est. 2020). The former is an official establishment in the newly constructed Olympic Park that serves as a tourist attraction, while the latter is a private museum located in the western suburb of the city, run by a local craftsman who strives to preserve traditional handicrafts passed down from imperial times. The two museums will shed light on how the official and private spheres interpret intangible cultural heritage in relation to historical and geographical contexts. Yet both examples demonstrate a clear tendency to rely heavily on contemporary individual ICR practitioners, having them present their works and craftsmanship for cultural and tourism purposes. Geographical factors, as well as the historical trajectory of specific ICH, appear to have been sidelined in favour of what museum-goers call experience.



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1953 - Tourism Pathways In Post Industrial Destinations As Heritage Conditioned Systems

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Theoretical background

A key question that needs to be addressed concerns new economic values, or even development paradigms, in post-industrial destinations. The first issue relates to the role of tourism in the future economy of post-industrial destinations, the potential risks associated with replacing one economic monoculture with another, and the mechanisms and procedures that could effectively mitigate these risks. The second issue concerns industrial heritage as a focal resource for developing a new local economy. The ways in which this asset is used, conserved, and protected are crucial for the future resilience and sustainability of tourism and, consequently, of the wider economic system. In post-industrial destinations, industrial heritage tourism might represent one possible response.

Conceptual approach

Based on a narrative literature review, we discuss post-industrial destinations not as fully coherent systems, but as uneven, contested, and often weakly integrated heritage-conditioned configurations, in which tourism may emerge as a development pathway that can either contribute to diversification or reproduce new forms of monocultural dependence. In this context, particular emphasis is placed on the development potential of industrial heritage tourism.

Discussion and conceptual implications

The limitations of industrial heritage tourism may paradoxically constitute a strength from the perspective of sustainability and destination resilience. While it is well established that such tourism rarely compensates for the economic, social, or cultural decline following industrial closure, its limited scale can encourage the development of more diversified local economies in which tourism remains only one component rather than a dominant development strategy. The relatively low development pressure associated with industrial heritage tourism also reduces the risks linked to mass tourism, facilitating more effective heritage conservation and long-term management. Moreover, by drawing on history, tradition, and industrial identity, industrial heritage tourism can stimulate participatory planning and community engagement – key resources for both tourism governance and broader local or regional development. In this sense, industrial heritage tourism occupies a conceptual crossroads between sustainability, resilience thinking, and evolutionary approaches to regional development.



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2075 - Contemporary Contested Dark Tourism Heritage Sites

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Keywords

#Dark tourism

#Contested heritage tourism

#Dissonant heritage

Background/hypothesis-

Contested heritage tourism explores how places are commodified for profit, and the tension at times between official state narratives versus local populace's memories versus media interpretation of events. This transdisciplinary research considers dissonant heritage - sometimes called 'heritage that hurts' - covering sites of death and disaster, including analysing the intersection with tourism. This encompasses investigating the role of 'thanatourism' - from the Greek word 'thanatos', meaning death (AKA 'dark tourism') - in rehabilitating and rebranding former trauma sites. It covers such controversial locations as the Jonestown massacre site in Guyana where over 900 people died in 1978 through murder/suicide at the "The People's Temple" cult, and the former coca-cartel capital of Medellín, Colombia – where drug lord Pablo Escobar is both reviled and revered.

Materials and methods -

This research is mainly based on auto-ethnographic and phenomenological research, as well as drawing on a quarter of a century's academic analysis of thanatourism dating back to the 2000 seminal work, *Dark Tourism - The Attraction of Death and Disaster* (Lennon, J. J., & Foley, M: Continuum). It includes observations undertaken on location in South America at sites such as the former Hacienda Nápoles – a 20 km² estate built and owned by Pablo Escobar approximately 150 km east of Medellín and 250 km northwest of Bogotá.

Results/conclusions-

This research is still underway and forms part of a wider analysis of the nexus between demand (interest) and supply (tourism product) in thanatourism. Dark tourism is currently a USD \$32 billion industry globally, predicted to compound grow at 2.5% annually to USD \$41 billion within the next decade (Future Market Insights, 2025). However, despite its importance to the global economy, there is a knowledge gap in academia about the causal connection between generating Attention, Interest, Desire and Action (the AIDA marketing model) in terms of intention to visit dark tourism destinations.



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2179 - Heritage As Seen By A Gamer. New Horizons For Tourism

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The relationship between cultural heritage, tourism and video games is an emerging field of interest in contemporary tourism research, which is part of broader debates on spatial representation, place-making and digital mediation. From a geographical perspective, video games can be understood as spatial narratives that construct, reinterpret and disseminate representations of heritage landscapes, historical environments and places of cultural significance. In this context, this paper examines how interactions between heritage, tourism and video games affect travelers' motivations and their role in new trends in destination tourism promotion.

Video games increasingly reproduce and reimagine heritage spaces through detailed digital environments inspired by real-world places, monuments, and landscapes. These virtual geographies are selective and interpretive constructions that reflect cultural values, power relations, and dominant historical narratives. Furthermore, video games participate in the production of heritage imaginaries, influencing the way players perceive and relate to places across spatial and temporal scales. Other relevant issues from a heritage perspective include the theme of perceived authenticity, spatial accuracy and the role of digital media in shaping cultural identity.

In relation to tourism, video games can act as mediators between virtual and physical spaces, contributing to new forms of tourist motivation and spatial practices. Video game-induced tourism shows how digitally experienced places can stimulate desire, emotional attachment and physical mobility, encouraging travel to places associated with or inspired by the worlds of video games. These processes affect the visibility of destinations, tourist flows and the symbolic value of places. In this context, the study analyses different dimensions (selection of cultural elements, types of heritage, educational and cultural outreach, impact on heritage preservation) in four video games set in different territorial contexts: Black Myth: Wukong (Shanxi, China), Assassin's Creed: Origins (Egypt); Assassin's Creed: Unity (Paris, France) and Yakuza (Japan). Likewise, a survey of players of the first video game has been carried out, which has made it possible to evaluate the shift from a passive position to the consideration of players as active agents, which may have consequences for new tourism practices and new relationships with heritage among younger generations.



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2234 - Soviet Military Heritage Tourism Magnet Or Local Burden

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Military heritage sites are not only an essential part of historical heritage but also a historically significant motive for travel and a considerable attraction for travellers. Despite their social, educational, economic, and symbolic significance, military heritage - including its tourism context - remains an underexplored field in academic research. The “genius loci” of military heritage relates to historical events such as past wars and battles, evoking, on the one hand, the glory of armies and nations and, on the other, loss, mass casualties, ideological pressures, and helplessness between two fires.

In Latvia - once the USSR’s westernmost frontier - Cold War legacies remain starkly visible across sites from tourist hotspots to degraded, abandoned ruins. Yet the country lacks national or local strategies to preserve these as heritage assets, despite their transnational value. Some sites have even been “disinherited” amid national identity-building, highlighting challenges of managing difficult heritage.

Globally, interest in military heritage is increasing, particularly in tourism, where well-preserved, well-promoted sites strongly attract visitors. However, the Cold War legacy is tied to the Soviet occupation’s dark past for Latvian residents, making it essential to understand their attitudes toward preservation and tourism presentation - beyond merely meeting demand.

This study examines two Latvian Cold War sites via stakeholder analysis:

- (1) Ligatne Bunker: A 9-meter-deep subterranean complex built to shield communist elites from nuclear threats, now a flagship inbound tourism attraction.
- (2) Baltic Sea Coastal Zone: Former fortified, restricted border littered with Soviet-era relics, increasingly part of tourism offerings.

The two single case studies draw on residents’ perception research and tourists’ visitation motives and experiences to assess development potential while balancing local attitudes with tourism demand.



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2666 - Tourism Gentrification In Heritage Sites A Comparative International Perspective

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Heritage sites are increasingly embedded in global tourism circuits and frequently mobilised as drivers of economic development and place branding. However, the social effects of tourism intensification vary significantly depending on local contexts, heritage configurations, and governance arrangements. Drawing on a critical geographical perspective and the theory of the right to the city, this paper examines inequalities and conflicts of use associated with tourist presence in heritage sites, while questioning the systematic use of the concept of tourism gentrification.

The paper is based on a comparative study of four heritage sites in two national contexts: Istanbul and Safranbolu in Turkey, and Mont-Saint-Michel and the Perret district in Le Havre, France. Combining field observations, semi-structured interviews with residents and local stakeholders, and analysis of planning, tourism, and heritage policies, the research analyses how tourism development interacts with social environments, residential dynamics, and processes of patrimonialisation.

The findings reveal marked differences between the four sites. In the case of Mont-Saint-Michel, the interaction between the heritage site and its surrounding social environment remains weak, and the concept of tourism gentrification appears of limited relevance. In contrast, the historic town of Safranbolu exhibits a clear process of tourism gentrification, marked by the arrival of external capital, the transformation of housing into tourist accommodation, and the progressive exclusion of the local population, who are increasingly forced to relocate. Tourism development has profoundly reshaped the initial patrimonialisation process, reorienting it towards commercial and entrepreneurial interests.

Despite differences in urban scale, the cases of Istanbul and Le Havre display comparable dynamics. In both cities, tourism-related gentrification primarily affects neighbourhoods located in close proximity to protected or heritage-designated areas. Processes of exclusion linked to tourism are particularly evident in the Küçükpazar neighbourhood in Istanbul and the Eure district in Le Havre, where rising property values, changes in commercial functions, and conflicts over public space undermine residents' right to the city.

By highlighting both convergences and divergences, this paper argues for a context-sensitive and critical use of the concept of tourism gentrification. It emphasises the need to situate heritage-led tourism within broader political relations and linkages between representations and spatial justice.



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C24.17-Geography of Tourism, Leisure, and Global Change => Green Transitions in Tourism: Sustainability, Climate Adaptation, and Renewable Energy Futures



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2406 - Alpine Drought Climate Adaptation And Snowmaking In Alpine Ski Resorts Insights From The A Drop Project

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Episodes of drought in Alpine environments remain insufficiently understood, despite their potential growing intensity under climate change. Water uses in mountain tourist territories are multiple, often competing and competition might increase along with the pressure to adapt. Beyond domestic and tourism-related consumption, an increasingly significant use has emerged in ski resorts: water abstraction for snowmaking. Snowmaking has become a widespread technical adaptation strategy to climate change, aiming to maintain favourable snow conditions for skiing in the face of decreasing and more variable natural snow cover.

However, the intensification of this practice raises questions regarding the future sharing of water resources, particularly in contexts where water availability itself is expected to evolve due to climate change. These tensions call for a better understanding of local water systems, their uses, and their sensitivity to climatic variations, as well as for tools capable of supporting collective decision-making. This dynamic is critical to choose between adaption options that limit the risk of maladaptation.

This communication presents key insights from the ongoing European Alpine Space Interreg project A-DROP (September 2024–August 2027), which addresses drought risks in Alpine territories. The analysis focuses on two partner ski resorts: Avoriaz (France) and La Thuile (Italy). The project follows a participatory approach. First, a shared territorial diagnosis was developed with local stakeholders to identify and characterize the different water uses and perceived vulnerabilities. Second, water resources were modelled to assess their current functioning and potential evolution under different climate change scenarios. Finally, the results will be shared and discussed with local actors through dedicated workshops, with the objective of co-constructing climate services related to water, tailored to local needs.

By combining scientific modelling and stakeholder engagement, this contribution highlights the opportunities associated with water management in Alpine tourist destinations, and discusses how climate services can support more anticipatory water governance in a context of increasing climatic uncertainty.



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2489 - Cultural Ecosystem Services In Urban Tourism

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Cultural ecosystem services in urban tourism

Jan Henrik Nilsson

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This paper discusses central conceptual perspectives related to nature-based solutions in urban tourism, most importantly green infrastructure, ecosystem-based adaptation, and cultural ecosystem services, how they relate to one another, and how they relate to urban tourism practices. Together, these factors are seen as preconditions for tourist development to take place. Conceptually, ecosystem services can be described both as verbs (processes) or as nouns (outcomes) which gives the concept a double meaning, including both ecosystem services as practices/processes and ecosystem services as values/benefits. This is also the case with cultural ecosystem services that often have been viewed as outcomes or benefits from ecosystems. They need to be viewed as socio-cultural and material processes that take place in green infrastructure.

The theoretical findings are illustrated by case studies of best practice in Sweden, Denmark and Germany. We find that co-production of urban ecosystem services take place as place-specific processes in green infrastructure. There is also evidence of reciprocal connections between different ecological processes and between human and natural processes; the different co-production processes involved in creating space for ecosystem services in green infrastructure create “double value” by strengthening multiple ecosystem services. Cultural ecosystem services strengthen and are themselves strengthened in processes involving other ecosystem services. In relation to tourism planning, this means that there are strong arguments for developing places in green infrastructure with the aim both to enhance cultural and social experiences and promote ecosystem-based adaptation.

This paper contributes to the scientific discussion by combining two under-researched perspectives on the relationship between nature-based solutions and tourism: Firstly, the urban perspective on cultural ecosystem services and tourism. Secondly, the focus on creating, and not only preserve, ecosystem services in green infrastructure.



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C24.17-Geography of Tourism, Leisure, and Global Change => Immobility, Stuckness, and Work



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1029 - Performing Precarity Homeless City Tours And The Immobilising Paradox Of Entrepreneurial Inclusion

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Background:

In many cities, alternative tours that move beyond the conventional tourist gaze, e.g. decolonial walks, political tours, or socially engaged routes, have become an established niche within urban tourism. Homeless city tours, guided by people with experiences of homelessness, are part of this trend. Promoted as forms of entrepreneurial empowerment and social inclusion, they simultaneously raise critical questions about how tourism work may reproduce, rather than relieve, conditions of precarity. This study examines how such tours create opportunities for visibility and income while embedding guides in new forms of immobility and stuckness.

Materials and Methods:

The research draws on qualitative fieldwork in German cities, combining participatory observation of tours with interviews with homeless tour guides and social workers who organize them. The analysis is informed by critical tourism geography and urban sociology, mobilizing concepts of advanced marginality (Wacquant) and stigma (Goffman) to understand how space, labor, and inequality intersect in this context.

Results:

Findings show that guides' livelihoods depend on narrating personal hardship for mobile publics, transforming lived precarity into a consumable encounter. While tours provide short-term income and symbolic recognition, they remain embedded in informal arrangements with limited pay, bureaucratic constraints, and conditions that suspend futures rather than offer professional development. This creates a paradox: economic survival depends on sustaining the stigma of homeless identity, which in turn reinforces and reproduces cycles of immobility, leaving guides feeling 'locked-in' to a precarious present.

Conclusions:

Homeless city tours illustrate the immobilizing paradox of entrepreneurial inclusion. They mobilize marginalized lives as tourism products while immobilizing the workers who perform them, revealing how tourism's celebrated mobilities rely on the material and affective stuckness of its labor force. The case contributes to tourism geography by foregrounding how alternative urban tours can aestheticize and/or commodify inequality even as they perpetuate precarious forms of work.



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1238 - Stuck Between Categories Working Holiday Makers And The Paradox Of Immobile Mobility

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Working Holiday Maker (WHM) schemes are marketed as opportunities for youthful freedom, adventure, and cross-border mobility. Yet, beneath this veneer of fluidity lies a complex reality of spatial immobility, categorical entrapment, and precarious futures. Drawing on a systematic review of 78 peer-reviewed studies and ongoing ethnography, this paper examines how institutional visa architectures produce multiple forms of “stuckness.”

While imagined as mobile “working tourists,” evidence suggests 40% of Australian WHMs remain geographically immobile, often staying in a single location. More profoundly, WHMs experience categorical stuckness, legally defined as holidaymakers despite lived realities centered on labor. This creates a “permanently temporary” status where futures are suspended. This stuckness is institutionally engineered: visa conditions restrict movement, mandate specific regional work, and create hierarchies that privilege certain nationalities. For those seeking residency, cultural exchange rhetoric masks a protracted journey through sequential precarious visas. In Australia, regional work requirements channel migrants into exploitative farm labor—not as exchange, but as a mandatory passage through institutional gates.

However, stuckness also catalyzes resistance. WHMs exhibit motivational fluidity, navigating between categories like Cultural Exchange Seekers and Aspiring Migrants, demonstrating agency within constraint.

Focusing on the Australian WHM program, the US J1 visa, and potential UK-EU youth mobility schemes, this research argues that contemporary migration governance produces stuckness as a deliberate policy outcome to manage labor markets. Four policy scenarios are proposed, ranging from restrictive “Cultural Bubbles” to facilitative “Skill-Based Mobility” pathways, illustrating how institutional approaches can either entrench or alleviate the experience of being stuck. This challenges tourism scholarship to move beyond celebratory narratives of mobility and examine how work-travel regimes manufacture immobility.



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1678 - Staying In A Coveted Territory Subaltern Tourism Workers And Housing Employment Tensions In Coastal Brittany

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The local tourism labor market, which cannot be relocated (Dehoorne, 2002), is largely composed of service jobs dominated by operational functions. A defining feature of tourism employment is its precariousness, linked in particular to the predominance of seasonal and discontinuous contracts. This article therefore examines, from subordinate positions in the world of work, the ways in which tourism workers live, adapt, and sometimes resist in territories where maintaining their place has become increasingly difficult.

Focusing on local tourism workers implies a shift away from approaches that primarily associate tourism with mobility, including that of seasonal workers. Instead, the study analyzes the social relations produced by tourism and its effects on resident populations, particularly lower-level tourism workers. Drawing on a field survey conducted as part of doctoral research, the study is based in a long-established and highly touristic area on the southern coast of Brittany. This article advances the hypothesis that, while tourism is a job-creating sector that contributes to sustaining a permanent population in tourist areas, it simultaneously fuels and normalizes precariousness through the characteristics of the employment it generates.

The field survey takes place in two seaside resorts in Brittany. To explore the different ways in which they relate to the territory, the survey, primarily qualitative, aims to analyze the life trajectories of local tourism workers. Employers and recruiters are also being interviewed to better understand the local job market. Currently, around forty semi-structured interviews have been conducted with a diverse range of local stakeholders.

From these interviews with recruiters and employers, we can already identify some salient elements, notably forms of competition in recruitment that highlight ambivalences regarding the perceptions of local workers and mobile seasonal workers. Moreover, the development of jobs stemming from the digital economy contributes to a segmentation of tourism workers. Consider, for example, the cleaning jobs in short-term tourist accommodations, where invisibility is striking and can sometimes even be carried out undeclared, reinforcing the process of making workers invisible.

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2327 - Stillness In Motion Housekeeping Work And The Paradoxes Of (im)mobility

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Background

Housekeepers occupy a paradoxical position within contemporary regimes of mobility. They contribute to industries defined by movement through working in tourism, hospitality, and domestic services, yet their own lives are often marked by immobility, stillness and stuckness.

This paper highlights how housekeeping work both enables and constrains the workers' mobility. It shows how housekeepers are both kept immobile and stuck due to factors such as immigration policies (housekeeping is still a sector dominated by migrant workers), and socio economic inequalities, yet negotiate their immobility in ways that offer distinct perspectives on current understandings of stillness, stuckness, and immobility.

Methods

This research utilises working participant observation. Empirical fieldwork was conducted in five hotels in Sweden over eight weeks. The three researchers involved in the research worked with different housekeepers, making beds, cleaning toilets, and talking with the housekeepers about their work and personal lives.

Analysis took the form of researcher de-briefing sessions where each working researcher discussed their experiences of the day with the other researchers. These daily narratives formed the basis of a thematic analysis resulting in a nuanced and rich interpretation of the experiences of the housekeepers involved in the research.

Results

What emerged were stories of how housekeepers often creatively negotiated the temporalities of their labour. Lingering in unused spaces or taking micro breaks between cleaning each room room emerged as subtle acts of resistance. At the same time, the unceasing tempo of guest turnover and algorithmically scheduled workloads, including managerial monitoring, imposed restraints that immobilised workers within repetitive cycles of precarity.

Conclusions

This paper concludes by highlighting that whilst housekeeper's lives involved multilayered forms of immobility which restricted geographical mobility and stalled imagined futures, they often found ways to use stillness and stuckness as self-care and as a quiet reimagining of work's purpose and value.



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C24.17-Geography of Tourism, Leisure, and Global Change => Island Contestations: Reclaiming Utopia From Touristification



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1121 - Insularity From Necessity To Utopia

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The insular condition has historically fostered locally embedded forms of knowledge and practice grounded in the recognition of limits, fragility, and interdependence. This capacity to adapt social metabolism and social relations to conditions of scarcity and vulnerability famously attracted Walter Benjamin, who characterised such knowledge as existing “outside civilisation” (Valero, 2017). Insular cultures are shaped by the pursuit of a necessary form of metabolic autonomy, forged through a structural dependence on external sources for what cannot be locally produced. Under these conditions, island-based forms of knowledge have emerged, alongside mechanisms for managing the social conflicts generated by enforced proximity and coexistence.

This locally grounded knowledge of adaptation to isolation originated in necessity but acquires utopian potential in times of social and ecological crisis. On the one hand, it informs bottom-up collective responses to touristification. Grassroots movements thus contribute to the formation of a political subjectivity grounded in the right to influence democratic decision-making and oriented toward social reproduction, care, life, and the equitable distribution of well-being (Armas, et al., 2023).

On the other hand, the utopia of metabolic and social insularity—and even its defensive local responses (Harvey, 2002)—also attracts elites and capital seeking refuge from global turbulence through land grabbing and rentier strategies. Fantasies of escape to the sea, or in offshore contexts a dual form of evasion, give rise to top-down utopian imaginaries of oceans and islands as “spaces beyond the interference of politics and the nuisance of class antagonism” (Campling & Colás, 2021: 272).

This paper examines island-based contestations that seek to reclaim utopia from touristification, highlighting experiences of social empowerment among local communities from a class perspective. Preliminary findings suggest that expressions of resistance and defensive strategies take diverse forms: first, through public participation in social movements; second, through the reinforcement of locally rooted habitus—for example, deliberate slowing down, selective disengagement, the rejection of tourism-related social relations, and the prioritisation of cooperation among residents; and finally, through the adherence to far-right discourses that displace the roots of social conflict onto lower-income labour migrants or reinforce nationalist claims based on alleged ethnic superiority.



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1167 - Tourism Contestations In South Europe – A Review And Future Research Agenda

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Tourism in Southern Europe is increasingly contested as evidenced by the emergence of a variety of social movements under the network of Southern Europe against Touristification (SET). The appearance of protest against touristification across South Europe –the “pleasure periphery” of Europe– can be understood as a defense of the “right to the island” (Armas-Díaz et al., 2020), the “right to the city” (Zaimakis & Papadaki, 2025) or “urban-philía” (Blanco-Romero et al., 2019). Social contestations increased particularly since 2010 in the aftermath of the financial crisis 2008 and the pandemic episode 2020 with the rapid expansion of urbanization and short-term holiday rentals that reshaped housing markets and socioenvironmental relations. Social movements claim for more autonomy and power in the design of tourism in their corresponding territories, often using a framework of degrowth and socioenvironmental justice. Albeit the increase in contestations in South Europe, a comprehensive review of the current state of art is missing. Henceforth, this study aims to review academic literature about social contestation against touristification in the context of Southern Europe. Therefore, it analyses scientific publications that examine case studies of tourism protest throughout South Europe putting the focus on island territories. The following questions guide the inquiry. When did first case studies about tourism protest appear and how did they evolve temporarily? Where are struggles against tourism studied, indicating where touristification is experienced. Concentrate protests on islands? What diagnosis about touristification do social movements provide and what are their claims? What proposals and alternatives for future tourism pathways are discussed? And related to the study design, how is protest against touristification studied? Which methods are used and which theoretical perspectives are dominant in the field? This review provides a comprehensive overview about touristification in Southern Europe and the growing social and ecological contestations surrounding them. The contribution concludes by identifying knowledge gaps for future investigations into touristification and its contestations.



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1168 - Between Opportunity And Overload Touristification Environmental Pressures And Islander Perceptions From The Zadar Islands (croatia)

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Touristification has emerged as a significant transformative process on small inhabited islands, reshaping spatial structures and community life while intensifying pressures on environmentally fragile systems. This paper examines tourism-driven transformation on the inhabited Zadar islands (Croatia), positioning the archipelago as a representative Mediterranean island case characterized by strong seasonality, environmental constraints, and an increasing dependence on tourism.

The study adopts a mixed-methods approach integrating spatial, environmental, and social dimensions of touristification. Quantitative analysis is based on tourism and accommodation data, including the number and spatial distribution of short-term rental units, tourist arrivals, and overnight stays. These indicators are analyzed in relation to environmental pressure variables, specifically waste generation, electricity consumption, and water use.

Geospatial methods are employed to identify spatial concentrations of tourism infrastructure and to relate accommodation density and tourist intensity to patterns of environmental stress across the islands. Where temporal coverage of datasets varies, the analysis prioritizes seasonal dynamics and relative pressure rather than absolute thresholds, enabling for meaningful comparison despite uneven data availability.

The qualitative component consists of semi-structured interviews with members of local island communities, exploring perceptions of tourism development, changes in everyday life and environmental concerns. This approach provides insight into how residents interpret and negotiate tourism-related change, complementing quantitative indicators with experiential and place-based knowledge.

The paper aims to identify spatial and seasonal hotspots of tourism pressure, assess the extent to which tourism intensifies environmental pressures, and reveal convergences or divergences between measured impacts and community perceptions. By focusing on inhabited islands with limited water and waste-management infrastructures, the study contributes to island studies and tourism geography by highlighting the material and social limits of tourism growth and by informing context-sensitive approaches to sustainable island development.



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1433 - Local Memory And The Revitalization Of The Caoshan Mandarin Orange A Case Study Of Beitou District Taipei City

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Background & Hypothesis: Under the impacts of global environmental change and accelerating urbanization, traditional agricultural systems in rural–urban fringe areas face increasing pressure from land-use transformation, climate change, and industrial restructuring. Many locally distinctive crops have consequently declined. This study focuses on the Caoshan Mandarin Orange in Beitou District, Taipei City, which was once a key economic crop supporting hillside agriculture and local livelihoods. It hypothesizes that locally symbolic agricultural products can be recontextualized through revitalization and tourism–leisure practices, enabling them to function as mediators linking local memory, sustainable agriculture, and human–environment relationships.

Materials & Methods: This research adopts a qualitative approach combining literature review, historical document analysis, field observations, and semi-structured interviews with farmers, residents, and community organizations. Geographic Information System (GIS) analysis is also employed to examine changes in cultivation areas, land use, and agricultural landscapes over time, allowing an integrated analysis of material landscape transformation and symbolic place-making processes.

Results: The findings document emotional narratives and memory networks associated with the Caoshan Mandarin Orange across different generations. Revitalization and replanting initiatives have reshaped agricultural landscapes and generated new place-based practices that integrate agricultural production, ecological conservation, and tourism–leisure activities. Through experiential tourism and heritage interpretation, the mandarin orange has been transformed from a declining crop into a cultural and experiential resource.

Conclusions: The revitalization of the Caoshan Mandarin Orange represents a process of local recontextualization integrating social, cultural, and ecological dimensions. This case demonstrates how local-scale agricultural and leisure practices can address global environmental change while fostering sustainable development and the rearticulation of place identity in rural–urban fringe areas.



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1434 - Recapturing Island Imaginaries Through Nighttime Urban Tourism The Formation Of Tourism Spaces And Place Images In Yancheng District Kaohsiung

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Background / Hypothesis

Islands have long been imagined as spaces of retreat, refuge, and reconnection with nature. However, tourism-led urban development has increasingly reshaped these imaginaries, creating tensions between leisure-oriented spatial production and everyday urban life. This study hypothesizes that nighttime urban tourism functions as a critical spatial-temporal mechanism through which island imaginaries are rearticulated and negotiated within contemporary island cities, rather than simply extending daytime tourism activities.

Materials and Methods

This research adopts a mixed-methods approach using Yancheng District in Kaohsiung as a case study. Spatial mapping and classification are employed to identify the distribution and typologies of nighttime tourism spaces. Qualitative methods include nighttime field observations, policy and event document analysis, semi-structured interviews with government actors, local business operators, residents, and visitors, as well as questionnaire surveys, to examine how nighttime tourism spaces are produced, imagined, and experienced.

Results

The results indicate that Yancheng's nighttime tourism spaces are spatially dispersed across waterfronts, cultural facilities, commercial streets, and residential areas, rather than concentrated in designated entertainment zones. This dispersion intensifies the interweaving of tourism practices and everyday urban life. Different actors contribute unevenly to shaping nighttime spaces and place images, while users' perceptions highlight both attractive atmospheres and emerging frictions related to noise, crowding, and temporal disruption.

Conclusions

This study conceptualizes nighttime urban tourism as a spatial process through which island imaginaries are translated into governable and consumable urban forms. By foregrounding nighttime as a temporal lens, it demonstrates how island tourism imaginaries are continuously reworked through everyday practices and lived urban experiences in contemporary island cities.



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1501 - Title From The People's Revolutionary Government's 'new Tourism' To 'citizenship By Investment' An Analysis Of Grenada's Tourism Industry

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Abstract

In October 1983, the international airport under construction at Pt. Salines, in Grenada, became the site for US invasion, as US paratroopers parachuted, unmolested, on the newly constructed runway. The airport was to be a central infrastructure for the People's Revolutionary Government's economic strategy, to which an expanded and restructured tourism industry, that privileged local over foreign ownership, and was horizontally integrated into other sectors of the economy, was crucial. With the airport completed by the Americans, tourism expanded to dominate the economy and ultimately became the focus of foreign investment under its Citizenship by Investment program. Yet, the vision of tourism that the PRG hoped to advance once the international airport was completed was very different. Rather than an industry that was integrated with agriculture, the other key sector of the economy and centered on local ownership empowering Grenadians, tourism, over forty years, has consolidated to privilege foreign ownership, remains siloed from the rest of the economy, and increasingly marginalizes ordinary Grenadians. The tourism industry functions as emblematic of a model of neo-liberal 'development' pursued, not just in Grenada but across the Caribbean that located a focus on services, rather than manufacturing as the only viable economic strategy for small territories unlikely to be competitive producers of goods. This paper analyses the location of tourism, branded under the slogan 'Pure Grenada' in economic strategies pursued by subsequent governments since 1983, the underlying rationale, and the outcome of these for the industry and the location of Grenadians within it. It assesses the various local responses to the sector and considers how tourism can be refashioned along more equitable and sustainable lines.



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1553 - Spatiotemporal Analysis Of Land Use Changes Of The Cape Town Table Bay Induced By Land Reclamation

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Land Reclamation (LR) from the sea has been practised for decades by developing coastal cities in order to gain an economical forte through port expansion, increased investment opportunities, infrastructure development, and increased employment opportunities. Historically, LR represents one of the most significant anthropogenic modification of coastal lines, achieved through techniques such as dredging and poldering. While these processes are good for the economy, they are pervasive and induce environmental impacts such as loss of sand, altered hydrodynamics, reduced silt deposition, turbidity, wetland degradation, biodiversity shifts and increased flood risks in low-lying areas.

The entire world has espoused LR including South Africa's City of Cape Town, which is the administrative centre of the Western Cape Province and a major coastal metropolis in Southern Africa. The city's oldest building, the Castle of Good Hope (CoGH), built in the 17th century and once located adjacent to the shoreline, now lies about two (2) kilometres from the Table Bay Harbour, illustrating coastal changes induced by land reclamation.

A spatiotemporal analysis of the reclaimed land on the Cape Town foreshore was conducted using historical maps (1932, 1942), aerial photographs (1972 to 1992), and Landsat satellite imagery (1992-2022) processed through a hybrid classification approach, in order to determine the decadal land use land changes (LULC). Object-Based Image Analysis (OBIA) was applied to the historical maps in ArcGIS, Maximum Likelihood Classifier (MLC) for the aerial photographs in ArcGIS, and Random Forest (RF) classifier for Landsat satellite data processed via Google Earth Engine (GEE) cloud computing platform using JavaScript.

The classification results revealed sustained encroachment into coastal waters; an increase in Built-up areas (19,59% to 33,74%), a decrease in Bareground (19,68% to 2,53%) and Water (60,20% to 57,43%), and a Vegetation enhancement (0,54% to 6,29%) respectively. The study quantifies the decadal LULC, identifies trends of coastal line shifts, and introduces a predictive model for reclamation over the next 50 years. These findings provide critical insights for climate-resilient urban planning and sustainable coastal management.



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2719 - Not A Paradise Not An Island Apart Tourism And The Reconfiguration Of Insularity In Alicudi Aeolian Islands

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Background / Hypothesis

Small Mediterranean islands are frequently represented as remote paradises, a narrative that underpins and legitimizes processes of touristification. This contribution examines Alicudi, the westernmost and least accessible island of the Aeolian archipelago, in the southern Tyrrhenian Sea, historically framed as marginal, isolated, and resistant to modernity. The study argues that these representations coexist with, and often conflict with, the island's contemporary social and cultural practices. It hypothesizes that Alicudi exemplifies a form of “reticular insularity” marked by persistent tensions between external tourist imaginaries and situated forms of everyday life, belonging, and self-representation.

Materials and Methods

The research adopts a mixed qualitative–quantitative approach, combining the analysis of historical cartographic and travel sources, demographic data, and an ongoing survey of contemporary narratives. These include literary and cinematic representations as well as social media practices, with particular attention to narratives produced by new residents and women authors who increasingly mediate the island's image and tourism discourse.

Results

Preliminary results reveal a structural tension between tourist imaginaries constructing Alicudi as an isolated paradise and the island's lived, relational condition. While tourism has become central to recent demographic stabilization and economic sustainability, it has not produced extensive urbanization or large-scale landscape transformation. Instead, tourism operates as a field of friction in which imaginaries are selectively appropriated, negotiated, or resisted through everyday practices and narrative production, contributing to a plural but internally differentiated insular identity.

Conclusions

Alicudi emerges as neither a tourist paradise nor an island apart, but as a space where insularity is continuously reconfigured through tension, negotiation, and relational networks. The case offers a meaningful perspective on how minor islands engage with the contradictions of tourist utopias and, without resolving them, contribute to alternative and potentially more sustainable articulations of insular futures grounded in local practices and cultural plurality.



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C24.17-Geography of Tourism, Leisure, and Global Change => Island Tourism Futures: Rethinking Resilience and Regenerative Practice



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1203 - Art Island And Her Entrepreneurs A Study On Female In Migrants' Creative Agency

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While the contribution of creative in-migrant enterprises to rural revitalization has gained significant academic traction, the nuanced and dynamic entrepreneurial pathways of female pioneers remain critically underexplored. This study shifts the focus from result-oriented community enhancement to the intrinsic mechanisms of migration and entrepreneurship among women in creative rural contexts. Using Naoshima—Japan's premier “Art Island”—as a critical case study, the research investigates how symbolic cultural capital and large-scale art tourism infrastructure influence the “creative halo” that attracts and sustains in-migrant talent.

Adopting the lens of Actor-Network Theory (ANT), the methodology integrates extensive ethnographic observations with 15 semi-structured, in-depth interviews with 16 female in-migrant entrepreneurs. By challenging the human-centered perspective prevalent in rural entrepreneurship research, this study demonstrates that non-human actors—including art installations, physical infrastructure, and housing—are not merely static backgrounds but dynamic agents that actively attract, sustain, and sometimes challenge female entrepreneurs. The findings reveal a complex motivational hierarchy: while the island's unique creative atmosphere and symbolic capital are the primary drivers for initial in-migration, the decision to maintain long-term settlement is fundamentally contingent upon superior physical infrastructure and material stability. This indicates that effective rural revitalization requires more than cultural promotion; substantial investment in infrastructure and solutions to housing shortages are essential for sustaining settlement.

Furthermore, the study constructs a comprehensive conceptual model of the “dynamic entrepreneurial pathway,” identifying housing accessibility and socio-cultural community embedding as the most significant structural bottlenecks. It highlights specific challenges such as language barriers, labor shortages, and the difficulty of balancing childcare with career demands. Most pivotally, the research uncovers a persistent sociological paradox; although explicit gender discrimination appears absent in the creative public sphere, traditional patriarchy continues to operate through invisible, internalized, and implicit forms within the private domestic realm. By extending the focus beyond institutional discrimination to the male-centric traditions lingering in creative communities, this study offers critical theoretical contributions to the interplay between creative agency, materiality, and gendered power dynamics. These insights provide strategic guidance for attracting and settling female in-migrants to revitalize rural areas effectively.



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1665 - Rethinking Island Tourism Through Agricultural Regeneration Evidence From Ōmishima Island Japan

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This paper examines the future of island tourism through the lens of agricultural regeneration on Ōmishima Island in Japan's Seto Inland Sea. Facing rapid population ageing, youth outmigration, and widespread abandoned farmland, Ōmishima exemplifies the structural vulnerabilities shared by many small islands in Japan and elsewhere. At the same time, the island hosts emerging grassroots initiatives that link agriculture, tourism, and community wellbeing in ways that point toward regenerative island futures. Drawing on qualitative fieldwork with local newcomer farmers and other local actors, the study explores how agriculture can be re-positioned not only as an economic activity but as social, cultural, and ecological infrastructure for island resilience. Findings highlight three interconnected challenges: declining motivation among ageing farmers, institutional and cultural barriers to reutilising abandoned land, and increasing human-wildlife conflict linked to land abandonment. In response, local actors are developing place-based practices that circulate value within the island, including agri-tourism and gastronomic experiences and festivals that attempt to attract visitors but also to reinvest income into local socio-economic and cultural life and heritage. By situating agriculture at the centre of island tourism futures, this case argues that resilience on small islands can't be achieved through tourism alone, but through regenerative practices that integrate land stewardship, intergenerational engagement, and locally rooted economies.



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1763 - Community Driven Regenerative Tourism In Fragile Island Environments Dune Restoration Ecological Care And Climate Narratives In The Îles De La Madeleine (canada)

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Atr Iles De La Madeleine, Development, Iles-de-la-madeleine-Canada¹ Uqam, Deut, Montréal-Canada²

In island destinations increasingly affected by climate change, coastal erosion, and environmental fragility, tourism is often framed through economic performance or risk management narratives. This paper adopts a practice-based and reflexive approach to explore how community-driven, experiential initiatives can reposition tourism as a form of ecological care and collective responsibility, while contributing to long-term wellbeing for island communities.

Drawing on the case of the Îles de la Madeleine (Québec, Canada), the presentation focuses on dune restoration activities organized by Attention Fragiles, a local environmental organization dedicated to protecting sensitive coastal ecosystems. Centered on the participatory planting of *Ammophila breviligulata* (American beachgrass), these activities are open to both residents and visitors and combine hands-on environmental action, climate change education, and place-based learning. Rather than positioning visitors as passive consumers, the initiative actively involves them in the maintenance and regeneration of fragile island landscapes.

This case illustrates how regenerative tourism practices can contribute to shifting imaginaries of islandness—from idyllic and consumable spaces toward living, vulnerable environments requiring care, stewardship, and long-term commitment. The activity also highlights the deeply relational nature of island tourism, where environmental organizations, tourism actors, local residents, and visitors collaborate within dense networks of trust and mutual support. Such forms of collaboration and maillage, strongly embedded in the archipelago's social fabric, reinforce community resilience while fostering a shared sense of responsibility for island futures.

Finally, the paper introduces an emerging initiative aimed at developing a common climate change narrative for tourism stakeholders in the Îles de la Madeleine. This project seeks to equip local actors with shared language and storytelling tools to better inform and educate visitors about climate impacts, adaptation efforts, and regenerative practices. By linking experiential tourism, ecological care, and collective climate narratives, the presentation contributes to ongoing debates on regenerative travel as a socially embedded, community-driven pathway toward more just and sustainable island tourism futures.



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1849 - Choice Of Island Choice Of Place Location Decisions Of Female (co)entrepreneurs In Tourism
Carolyn Funck¹

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Female entrepreneurs play an increasingly important role in tourism development in rural and peripheral areas. Research has focused on motivations, barriers and challenges and pointed out that entrepreneurship can both challenge and reinforce gender stereotypes. Motivations have been analyzed in the tension between necessity and opportunity, as well as push- and pull factors, but research rarely emphasizes active choices made in the process of starting a business, especially concerning the selection of place. This paper will analyze the complex factors for location decisions from the examples of three islands on the Western edge of Japan striving to attract population and business. I will analyze these factors on three levels. On the macro level, the island fields are compared through characteristics such as tourism structure, support policies and peripherality. On the meso level, the analysis of social networks and their importance explains choices for leaving as well as choosing specific locations. Finally, on the micro level, the existence of gendered strategies and active selection of places is examined. The research is based on longitudinal studies of the three islands and the qualitative analysis of interviews with 20 female (co-)entrepreneurs involved in tourism industries. The interviews were transcribed and then coded in MAXQDA to provide information on the three levels of choice of location for life and business.

Results indicate important results on all three levels. On the macro level, natural tourism resources classified as world heritage and policies to support start-up businesses distinguished the three fields, while possibilities to choose between degrees of peripherality on large islands were identified as a common factor. On the meso level, experience of social networks positively influenced location choices, as did existing connections to family and partners. Finally, on the micro level, an active process of finding the ideal locations on the selected island could be observed, leading to a diversification of business locations, although gendered strategies played no major role. Results suggest the need for a more detailed analyses of location decision processes and for policies to support diverse location patterns.



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1874 - Heritage Process On A Tourism Island A Cross Sectional Study Of Miyajima Japan

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With the development of Critical Heritage Studies, heritage is no longer understood as an unchanging entity but as a social, cultural, and political process. Tourism becomes embedded in this process by bringing flows of knowledge, information, culture, and people. In doing so, it strengthens exchanges between local communities and the outside world, reshapes socio-cultural dynamics within local societies, and further complicates heritage-making processes.

This study focuses on the heritage process in Miyajima, a representative tourism island in Japan. Miyajima is famous for Itsukushima Shrine, a holy site of Japanese Shinto, also nominated as a World Cultural Heritage site in 1996. In addition to the careful preservation of shrine buildings, religious events and festivals have been continuously maintained and supported by the local community. Despite a growing number of tourists—reaching 4.85 million in 2024—the island has experienced a severe population decline, with fewer than 1,400 residents in the same year. Miyajima is reaching a critical turning point that will profoundly influences its heritage process as well as its future as a heritage tourism island.

This study presents a cross-sectional view of the heritage process in Miyajima and highlights the diversification of identities, values, and cultures associated with tourism influxes. Despite the decline in the island's total population, new businesses and projects are initiated by newcomers with different backgrounds, motivations, and personal histories related to Miyajima. By sorting out newcomers' attitudes toward Miyajima's living culture as well as their engagement with community affairs, this study offers insights into the island's future transformation.

The contributions of this study can be summarised in two points. First, this study emphasises the complexity and diversity of local communities, which have mainly been conceptualised as homogeneous groups in the existing heritage tourism literature. Secondly, this study demonstrates that islands constitute an appropriate geographical setting for investigating heritage processes in tourism, as their relatively isolated socio-cultural environments not only well preserve long-standing traditions but also clearly reveal the interactions between tourism influxes and heritage transformation.



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1986 - Towards A Better Understanding Of Tourism Critical Social Movements

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Background

Recent years has seen increasing mobilisations of social movements critical of tourism, often but not exclusively in cities and on islands. While many studies have addressed the underlying issues the movements protest about, namely instances of overtourism and its consequences, such as overcrowding, resource conflicts, pollution, pressures on housing and land, and changes to social and economic infrastructures, there is to date very little research that uses social movement studies approaches to investigate tourism critical social movements (TCSM).

Materials

It is widely unknown, for example, what class composition TCSM have. Are these classical workers rights movements, or more like new social movements often defined by middle class backgrounds. This includes the crucial question whether TCSM members entail owners of property or are more dominated by people renting their housing. There are similar questions about the gender and race compositions of TCSM, and specifically the question to what extent members claim or understand themselves to be 'locals' or, conversely, identify as having more mobile, trans-local backgrounds. We also do not know very well to what extent TCSM in different regions compare and what differences exist between different places in which these movements occur. Lastly we know that tourism is sometimes seen as a social movement and entails movements of solidarity and struggle on the site of the tourists, but how if at all does this relate to TCSM. Key further questions relate to the success and failures of TCSM, their repertoires of action, waves of mobilisation and inter-movement learning.

Methods

Drawing from social movement studies, sociology and political science this paper proposes to explore some conceptual foundations of a better understanding of TCSM. The paper will further collect existing empirical knowledge on TCSM, working towards a conceptual frame for broader comparative and comprehensive studies of different TCSM.

Results

This work will be of benefit to all who, in the broadest sense, hope to better understand tourism and its social and political effects. Specifically we hope to support efforts to better understand current and past mobilisations of TCSM.



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2250 - Beyond Performance Re Presenting Traditional Music And Dance In An Indigenous Led Music Festival

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Existing island studies often approach islandness from many perspectives, such as policy or socio-economic development. Relatively little attention is paid to how indigenous-led cultural practices serve as concrete spaces for reimagining island cultural heritage, especially within the East Asian context. This study aims to explore how the Dulan tribe, an indigenous community in Taiwan, uses an indigenous-led music festival as a cultural practice. It creates a new way to present indigenous traditional music, dance and cultural identity through performance within the festival. Based on these objectives, this paper employs participatory observation, semi-structured interviews, and textual analysis as research methods to understand how island cultural heritage is practiced and interpreted within the music festival. This study shows that the Amis Music Festival is not merely a cultural event, but a space where participants can experience the shaping of island culture. At the same time, the festival strategically collaborates with external partners while retaining local cultural authority over representation and decision-making, thereby further revitalizing the community. The contribution of this study lies in demonstrating, through the case of an indigenous-led music festival, that island cultural heritage does not only exist in specific locations or historical objects, but can be continuously generated through cultural practices.



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C24.17-Geography of Tourism, Leisure, and Global Change => Resilience and Sustainability in Tourism Geographies



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1063 - Tourism (de)growth In National Parks; Implications On Arctic Resilience Towards Tourism Growth.

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Tourism growth in Arctic national parks creates governance challenges as increasing visitation intersects with ecological fragility, uneven regional development and declining public funding. Less is known about how national parks governors and adjacent communities stay resilient towards tourism growth. Drawing from social constructionism, the study examines how growth is interpreted socially, and on degrowth, which questions the difficulty of implementing limits to nature-based destination governance. The study utilises qualitative interviews with senior specialists and managers of the Finnish national park principal governor, in addition with key management documents from the most visited arctic national parks of Finland. Findings show that growth is socially constructed as a self-reinforcing and legitimate trajectory: once visitation surpasses certain thresholds, additional growth becomes numbingly socially normalised by communities, and governors totally disallowing degrowth-mindset. Parks with minimal growth tend to stay in certain limits due to reputation, remote location and lack of additional touristic infrastructure. Based on the findings, two frameworks are established to conceptualize resilience in Arctic national parks: 1) governance-resilience and 2) community-resilience. Community-resilient adaptation describes how local communities over time adapt to tourism growth, thus increasing social resilience. The governance-resilience framework displays how principal governors build capacity to overcome challenges through the accumulation of experience and trust in their own ability to manage complex growth-related issues. The study further identifies three distinct arctic national park growth systems: 1. Tourism-center-based – national parks situated within or adjacent to established tourist infrastructure, such as ski resorts. 2. Reputation-based – parks that have gained popularity primarily due to specific attractions. 3. Wilderness-based – where growth is deliberately limited to preserve the authenticity of the wilderness experience. The proposed frameworks offer a foundation for understanding how both communities and governance structures can maintain resilience in the face of tourism growth, providing theoretical insights for arctic resilient governance.



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1394 - From Extractive To Experiential Re Imagining Forest By Products As Sustainable Tourism Resources

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In Europe, traditional forest by-products such as potash, tar, resin, and charcoal (PoTaRCh) are being re-positioned from extractive commodities to experiential tourism assets. Although this transformation reflects larger trends toward sustainable tourism, the development of circular bio-economies and the valorisation of intangible cultural heritage, the spatial patterns, governance processes and socio-ecological effects remain under-researched. This paper aims to examine how PoTaRCh-related practices are being transferred into tourism experiences, and how this process recreates the relationship between heritage, nature and regional development. By using a comparative mixed-methods design, the study analyses 30 PoTaRCh-based tourism products in four European regions, combining spatial mapping, content analysis on tourism narratives, semi-structured interviews with traditional bearers, tourism operators and heritage managers (n=18), and a pilot visitor survey (n=50). The study considers three aspects, including: (1) the experiential re-framing of extractive processes (production to performance), (2) creation of authenticity and sustainability in tourism storytelling, and (3) tensions arising between economic valorisation, cultural continuity and environmental constraints. The results provide three dominant transformation pathways: heritage interpretation in the museum, immersive craft experiences, and hybrid bio-cultural innovation models that can be used to connect tourism with bio-economy endeavors. Although these pathways increase the visibility and income opportunities of the local communities, they create novel forms of commodification, selective tradition-making and ecological pressures. The paper holds that the extractive-to-experiential transformation is not only a tourism innovation, but a geographical restructuring of forest landscapes as cultural-economic spaces. Placing PoTaRCh tourism in the context of sustainable development, heritage governance and global change, the research will contribute to the interpretation of how peripheral forest territories can find their way through post extractive futures and how cultural tourism can both facilitate and disrupt sustainability transitions.



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1473 - The Causality Of Tourism Spatial Control In Protected Areas

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Effective spatial control is a prerequisite for achieving sustainable goals in protected area tourism, but there are gaps in actual governance, and the causal mechanisms of implementation remain a black box. This article conducts a detailed empirical tracking of the operational process of the demolition in X Scenic Area, China. It reconstructs the causal evidence of the mechanisms behind the four segments of “cannot be demolished,” “cannot be moved,” “cannot be completed,” and “unwilling to be demolished,” and further compares and summarizes the intrinsic causal mechanisms of spatial control implementation. The study found that the implementation of spatial control in China’s nature reserve tourism is governed by a causal mechanism involving four interrelated components: “elements—capabilities—actions—norms.” The residual relationships and overlapping ownership of control elements, the hierarchical constraints and interactive transmission of control capabilities, the agency relationships and opportunism of control actions, and the internal transformations and external rectifications of control norms collectively determine the actual outcomes of spatial control. To ensure the long-term effectiveness of local spatial control implementation, it is essential to clearly define specific protection objectives, assess the actual contributions of regulatory interventions during the process, and dynamically adjust governance tools based on actual gaps and unexpected outcomes to achieve adaptive governance. The paper argues that a long-term system that ensures the implementation of local zoning control should not only have a clear goal of conservation, but also be able to monitor the real results of the intervention process in the long term. It also needs to be capable to choose different governance instruments to realize the dynamic debugging of the adaptive implementation according to the actual gaps and unintended results. The paper enhances the theoretical knowledge about interactive practice of governmental departments in tourism zoning control in protected areas. It is of some value for the insight into the local micro-action logic of nature conservation and tourism governance. Meanwhile, the paper is of academic significance in terms of methodology to promote the theory-based evaluation paradigm in the tourism research field.



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1635 - Designing A Tourism Geography Lesson □ Tourist Spot; Miyazaki □ As Sdgs Tourism Education Incorporating Viewpoints Of People Timeline And Economy

Kihachiro Sakai¹

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The government of Japan enacted the □Tourism Nation Promotion Basic Act□, Accordingly, the ACT positioned the realization of Japan as a tourism-based nation as a national strategy and contributed to economic development, improvement of the stability of people's lives, and international mutual understanding.

From the viewpoint of Sustainable Development Goals, the realization of a tourism-based nation to aligned with the sustainable development of regional society is an urgent issue to resolve in Japan.

Against such a social background, tourism education is becoming increasingly important with respect to citizens' active engagement and pride in and attachment to the region.

While the Course of study determined by the Ministry of Education in Japan, include geography education, tourism education has yet to be sufficiently included.

Therefore the present study sought to be develop a tourism geography education model lesson. First, the model lesson focused on the essential question of ; “Why we study tourism?”.

In this stage, students can understand how important tourism in industry shrinking and aging population and decline of regional economies problem in Japan.

Specifically, the inbound tourism generates 4.8 trillion yen for the Japanese economy, which ranks third, after the auto industry, and chemical industries at 12 and 8 trillion yen respectively.

Second, the model lesson used a case study of Shotaro Iwakiri, who is known as the father of Miyazaki tourism. Iwakiri dedicated himself to regional formation as touring destination.

Students could explore from his career.

Third, students consider the problem of overtourism in Kyoto and Mt. Fuji, as well as both positive and further negative aspect of tourism.

To verify the tourism-geography education model lesson, the author taught this lesson to university students. The results suggested the importance of home town education incorporating person, timeline, and economics in tourism geography education.



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2065 - Embedded Networks And Social Capital Building Tourism Resilience And Transformative Governance In Bali's Rural Tourism (case Study Of Bangli Regency)

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The Ministry of Tourism and Creative Economy of Indonesia identified rural tourism as a recovery strategy to increase tourism during the COVID-19 pandemic. Rural tourism is essential to sustainable rural development, and Bali was the key focus. The Tourism Village Programme, which prioritises rural tourism development economy, establishes 238 destinations across Bali, creating a paradox. Villages show strong internal social capital and community solidarity through local initiatives and traditional institutions, but remain vulnerable, indicating how governance failures fragment social capital and place communities in reactive resilience rather than transformative sustainability. This study examines governance complexity, funding politicisation, and policy implementation gaps as major challenges to rural tourism in the Bangli Regency. A qualitative study used semi-structured interviews and focus group discussions to collect data from rural tourism stakeholders. This empirical study shows how strong bonding social capital (menyama-braya (brotherhood), mutual reciprocity, traditional institution (customary village, Banjar, Subak, Tourism Awareness Group), and participatory decision-making rooted in Ti Hita Karana philosophy undermine rural tourism resilience in Bangli Regency. However, it cannot compensate the weakness of bridging and linking social capital when governance structures fail. The study found systemic governance failures affecting tourism resilience. Instead, persistent implementation gaps, inadequate infrastructure, limited youth participation, gender exclusion in decision making, and capacity constraints, show that conventional programmes delivery cannot catalyse transformative governance for sustainable rural development without external support. The study concludes that governance frameworks must recognise embedded networks and social capital as transformation drivers aligned with local wisdom and equitable community resilience to sustain rural tourism transformation. Without bridging and linking capital, even the strongest bonding social capital generates fragile resilience, where communities endure but cannot thrive and adapt and cannot transform to achieve sustainable development.



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2290 - Building Destination Resilience To Health Related Crises A Longitudinal Study Of Lisbon

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Background

Health-related crises represent non-linear, uncertain and dynamic disruptions that challenge traditional destination governance structures. Although resilience has gained prominence in tourism geographies, most crisis management frameworks continue to adopt linear and mechanistic approaches that fail to capture the complex and evolving nature of public health emergencies. Grounded in complexity theory, this study conceptualises destinations as adaptive systems in which resilience emerges through continuous interaction reminder of interdependent actors, feedback loops and institutional learning. Therefore, this study argues that destination resilience must be reframed through a transformational governance lens, integrating adaptive capacity, cross-sectoral coordination and institutional learning to foster sustainable recovery pathways.

Materials and Methods

A longitudinal mixed-methods case study was conducted in Lisbon between 2020 and 2024. Qualitative data were collected through two rounds of semi-structured interviews with nine institutional tourism stakeholders, complemented by content analysis of the national tourism board's digital crisis communication. Quantitative data were obtained through surveys administered to 21 hotel managers and 98 short-term rental operators. Additionally, a systematic literature review and meta-analysis of 36 peer-reviewed articles were undertaken to critically assess existing crisis management frameworks and their theoretical limitations, particularly regarding non-linearity, uncertainty and learning processes.

Results

The findings demonstrate low levels of pre-pandemic preparedness and an initially reactive response among tourism stakeholders. However, the crisis functioned as a catalyst for adaptive transformation, triggering operational restructuring, digitalisation, implementation of health protocols and the progressive institutionalisation of sustainability principles. From a complexity perspective, governance responses evolved through iterative feedback processes and multi-scalar coordination. Organisational learning emerged as a central resilience mechanism, reflected in enhanced cross-sectoral collaboration between tourism and public health authorities, the institutionalisation of crisis planning and the development of flexible response capacities. Based on these insights, a non-linear five-phase crisis management framework is proposed: prevention, prodromal, emergency, long-term recovery, and resolution and learning, underpinned by internal feedback loops and adaptive governance mechanisms.

Conclusions

The proposed framework advances current debates on resilience and sustainability in tourism geographies by operationalising transformational governance principles. It provides a theoretically grounded and empirically validated tool to support sustainable destination management and enhance long-term resilience to future health-related crises.



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2300 - Who Remembers Heritage Tourism Place And Community Resilience

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Heritage tourism is frequently promoted as a means by which to not only ensure adequate site preservation but also to aid in the achievement of sustainable development in local communities, with heritage tourism being a key factor in many community-based tourism projects in the Global South. However, heritage often plays a significant role in community identity construction and as an impetus for community collective memory, which may diverge from the formally constructed authorized heritage discourses used in tourism. In the long term, this can cause a schism between communities and their heritage, but even in the short term, this can still have significant implications for community place attachment and, by extension, community resilience. This is due to the important intersections between heritage and place, which are often the loci for individual and collective memories. Place attachment has been noted as playing a key role in community responses to change, with stronger levels of place attachment having been noted as important for the development of local community resilience. Thus, this presentation will interrogate the use of heritage tourism as a sustainable development mechanism by unpacking the complex relationships between collective memory, place attachment, and community resilience in a rapidly changing world.



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2371 - From Risk To Regeneration Strategic Disaster Risk Management For Tourism Resilience In Petrópolis Brazil

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Introduction/Hypothesis

This project investigates the Petrópolis-RJ paradox: a destination whose mountainous landscape generates tourism attractiveness while simultaneously increasing vulnerability to climate-related disasters due to the social construction of risk. The central hypothesis is that current management practices, reactive and disconnected from systematic risk analysis, threaten the long-term economic continuity of the tourism sector. The objective is to develop a strategic management framework that integrates Disaster Risk Reduction (DRR) with the principles of Regenerative Tourism to mitigate impacts.

Materials and Methods

This study adopts an applied research design and a critical case study approach, using a mixed qualitative–quantitative methodology structured in three phases. Phase 1 employs geoprocessing and statistical analysis to diagnose risk patterns using data from S2iD and IBGE. Phase 2 examines managerial risk perception through interviews with tourism stakeholders and public authorities. Phase 3 applies action research, triangulating data through collaborative workshops to validate management and communication protocols, grounded in Mintzberg’s emergent strategy framework and Coombs’ crisis communication theory.

Results

The study is expected to identify the spatial overlap between risk areas and tourism infrastructure and to correlate disaster occurrences with economic flows. The main outcome will be a Technical–Technological Product (TTP): a practical crisis management and communication guide for the hotel sector, comprising validated protocols and a risk intelligence indicator dashboard to support strategic decision-making.

Conclusions

The study concludes that resilience requires moving beyond neutral sustainability toward regeneration, in which tourism actively contributes to the socio-environmental healing of the territory. The proposed framework seeks to transform the tourism sector from a passive victim into a proactive agent, aligning local management with global climate agendas such as the Sendai Framework and COP30.



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2581 - From Protection To Constraint Non Intervention And Tourism Resilience Under Extreme Heat

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Background / Hypothesis

Tourism landscapes in ecologically sensitive regions are often managed through principles of minimal intervention, based on the assumption that limiting physical infrastructure protects environmental quality while sustaining visitor access. Under accelerating climate change, however, this protection-oriented approach may become increasingly misaligned with on-the-ground conditions. In hot and arid destinations, extreme heat, prolonged drought, and concentrated visitation intensify ecological stress while simultaneously undermining the resilience of tourism systems. Focusing on Sedona, Arizona, this study examines how non-interventionary tourism management performs under extreme climate conditions and how the absence of climate-responsive access and facilities affects ecological and operational resilience.

Materials and Methods

The study employs a qualitative, mixed-method approach combining site-based field investigations at high-use tourism locations, questionnaire surveys examining visitor behavior and perceptions during periods of extreme heat, and 31 semi-structured interviews with Indigenous representatives, conservation agencies, planners, tourism professionals, and visitors. These methods are complemented by participatory workshops that examine governance challenges, institutional constraints, and the adaptive capacity of existing tourism management strategies under climate stress.

Results

Results indicate that insufficient climate-responsive infrastructure and access management contribute to declining destination resilience. Unmanaged parking and informal access accelerate erosion and landscape degradation, while limited shade, circulation, and heat-adaptive facilities reduce visitor safety, comfort, and duration of stay. Survey and interview data further suggest that extreme heat shortens visits, shifts temporal patterns of use, and introduces uncertainty into tourism operations. Rather than enhancing adaptive capacity, non-intervention in this context constrains the ability of tourism landscapes to respond effectively to climate stress.

Conclusions

The research argues that resilience in climate-stressed tourism geographies is shaped through governance processes rather than emerging solely from restraint. Under conditions of extreme heat, non-intervention can shift from a protective logic to a constraining one, limiting adaptive capacity across ecological and operational dimensions. Recognizing this shift is critical for aligning tourism resilience with long-term sustainability goals and for understanding how existing management approaches may inadvertently reproduce vulnerability as climate stress intensifies.



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C24.17-Geography of Tourism, Leisure, and Global Change => Rethinking Access to the City



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1098 - Locality Visuality Performativity And Identity ‘checking In’ The Rockbund Art Museum Manifested Four Dimensionally Geographical Space Of Shanghai Urban Tourism

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Background/Hypothesis

Rockbund Art Museum (RAM) is a non-profit contemporary art institution opened in 2010 which is located on the Bund, the best-known landmark of Shanghai, and where once belonged to the Shanghai International Settlement occupied by ‘Western imperialism’ during the period of Chinese semi-colonial history. At the same time, the museum is also housed in an Art Deco (colonial) heritage architecture (Royal Asiatic Society) decorated with Chinese traditional cultural details and motif that was established in 1932 originally as one of the earliest museums in China during the Chinese semi-colonial period.

Materials and Methods

Within the background above, due to its overwhelming superiority of geographical location and the unique architectural style characterised by a mixture between Western and Eastern, the RAM visually attracts the various tourists to do ‘checking-in’ for photographing and vlog-filming. In doing so, inspired by the understanding of ‘checking-in’ culture being popular among ‘social-media-tourists’, this paper leverages extensively the methods of visual autoethnography by ‘checking-in’ the RAM as a ‘Chinese-researcher-performed-tourist’ to explore how RAM re-forms Chinese cultural identity in the geographical space of Shanghai urban tourism.

Results

As a result, this geographical space manifests four dimensions, and they can be deconstructed as: 1) Museum space (of exhibition), 2) Architectural space (of colonial heritage), 3) Local space (of the Bund) and 4) Urban Space (of Shanghai). These dimensions of space also adhere to the representation of a new/modern mixed-cultural Chinese image and urban identity in contemporary Shanghai, which can also be then displayed in four-dimensionally geo-cultural binary relations: 1) Eastern/Western, 2) Local/Imported, 3) Rural/Urban and 4) Absent/Present.

Conclusions

Taking the colonial history and postcolonial discourse of the Bund in Shanghai into consideration, the RAM, relying on its own protection of cultural heritage and geographical advantages of cross-cultural integration in Shanghai urban tourism, has developed a new geo-culturally aesthetic space to promote contemporary arts and lifestyle and shape a new Chinese cultural identity. This said, the tourist behaviour of ‘checking-in’ the museum can be seen as a microcosm of the contemporary Chinese urban culture with the ‘modern’, ‘fashionable’ and ‘vanguard’ characteristics in the post-reform present of Mainland China.



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1778 - Access To Energy An Approach To New Indicators Of Urban Fragmentation Based On The Use And Availability Of Renewable Energy

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Urban fragmentation analyses are usually approached through economic and social indicators. However, studies linking urban inequality with access to renewable energy remain relatively scarce. In Spain, this type of “clean” energy accounted for 18% of available primary energy and 9.5% of final energy consumption in 2023. Compared with 2022, this represents an increase of 14.5% and 14.3%, respectively. Nevertheless, according to our hypothesis, access to this type of energy is neither socially nor spatially equitable, and may therefore contribute to increasing urban fragmentation.

In this context, the aim of this paper is to examine unequal access to renewable energy and digitalisation tools in Palma (Spain) as a means of delineating the social map of renewable energy. This analysis combines indicators of energy consumption by urban districts and solar panel potential based on four variables: neighbourhood type and building age, income level, housing tenure regime, and foreign population rate (Global North and Global South). The sources used combine commonly employed statistical data, such as the Cadastre and the National Institute of Statistics, with other recently available but still underexplored datasets with high research potential, such as the Balearic Islands Photovoltaic Map and the Building Solar Power dataset. The results show that the most affluent urban districts of Palma not only enjoy better access to renewable energy and installation subsidies, but also greater access to digitalisation tools. In conclusion, within the broader debate on the right to the city, it is necessary to implement public policies that ensure genuine spatial justice in the use and enjoyment of renewable energy within urban environments.



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1825 - Access At The Margins Industrial Zoning And Spatial Inequality In Seattle's Lower Duwamish River Corridor

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Background / Hypothesis

Access to the city is increasingly shaped by land-use regimes and infrastructural priorities that privilege regional logistics and industrial functions over everyday needs of residential communities. This paper examines how industrial zoning structures lived access in Seattle's Lower Duwamish River corridor, focusing on the long-established neighborhoods of Georgetown and South Park, where industrial land use and daily life have long coexisted.

Materials and Methods

The study employs a mixed-methods approach that connects spatial analysis with community perspectives to examine how planning decisions translate into everyday experience. GIS-based spatial analysis is used to assess zoning orientations, the availability of public and environmental resources, and patterns of everyday movement, drawing on municipal zoning data and socio-economic indicators from the American Community Survey. These spatial patterns are complemented by interviews and workshops, which show how residents encounter access constraints in daily life and understand their position within land-use and planning processes.

Results

The findings reveal a strong spatial concentration of industrial land use across the Lower Duwamish River corridor. In Georgetown, approximately 87% of land is designated for maritime manufacturing and logistics, while the figure reaches about 61% in South Park. These zoning patterns correspond with limited provision of public green space, waterfront access, and weak local transit coverage. Socio-economic data further indicate both neighborhoods exhibit median household incomes below the King County average. Interviews with residents suggest that these access constraints are experienced as persistent and structural, rather than as temporary outcomes of recent development.

Conclusions

The research argues that unequal access in industrial river corridors is not incidental but produced through land-use regulations and governance decisions. By linking spatial patterns with community perspectives, this study contributes to debates on access to the city and underscores the need for planning approaches that engage more seriously with lived access and social equity in industrialized urban neighborhoods.



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2104 - Rethinking High Income Urban Fragmentation Through Narratives Of Luxury And Exclusivity In Barcelona

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In a context of growing social inequalities linked to increasing barriers to housing access, this paper examines the production of high-end residential enclaves and explores their implications for access to the city in the Spanish Mediterranean. It assesses whether the emergence of residential projects targeted at affluent groups reflects a recent tendency towards reinforced urban fragmentation in a context traditionally characterised by relatively open urban forms. While the academic literature has rarely identified gated communities comparable to those observed in other regional contexts, this contribution focuses on the development of semi-enclosed high-income residential complexes in the metropolitan area of Barcelona.

The analysis adopts a mixed-methods approach combining critical discourse analysis, socio-economic indicators and urban morphological analysis. First, it examines the discourses produced by a selected group of developers specialising in luxury residential projects operating in the metropolitan area. Second, it analyses a documentary corpus of recent real estate advertisements associated with some of these developments. Third, it characterises the social and morphological differentiation of the resulting residential complexes in relation to their surrounding neighbourhoods through the use of synthetic statistical indicators and cartographic analysis.

This approach enables an examination of how imaginaries of residential luxury are constructed and how exclusivity and security are formalised in developments oriented towards economic elites, contributing to the regulation of access from both symbolic and physical perspectives. The findings highlight convergent trends towards increasing urban fragmentation that challenge the idea of Spanish Mediterranean metropolitan areas as being less affected by enclave urbanism. By moving beyond a narrow focus on formally gated communities driven by security concerns, the paper contributes to broader debates on how access to the city is reconfigured through high-end residential production in tourism-intensive metropolitan areas.



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2152 - Caring Under Pressure How Ongoing Touristification In Lisbon's City Centre Has Been Affecting Mothers And Their Children

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This research draws on key concepts from feminist geography and urban planning to explore how touristification has been affecting the everyday lives of mothers and their children in Lisbon's historic centre. Research on urban tourism shows that the growth of tourist-oriented activities in residential areas disrupts local life. These changes include housing instability driven by short-term rentals, the decline of proximity commerce, and the rise of tourism-focused retail. Studies also highlight the overcrowding of public spaces and the weakening of local support networks as tourist pressure intensifies. At the same time, feminist and gender studies demonstrate that women, particularly mothers of young children, remain primarily responsible for care and domestic work. Their daily lives depend on nearby services, safe and accessible public space, and stable community networks. When these infrastructures are transformed by tourism, their routines become more difficult, reinforcing gender inequalities. This research draws on nine walking interviews with mothers living in the city centre. Participants shared their everyday experiences while moving through their neighbourhoods. In some cases, participants were accompanied during tasks such as taking children to school or shopping. This approach enabled access to situated and embodied knowledge and allowed observation of sensory and symbolic effects of touristification. Initial findings show that touristification increases daily stress, lengthens routine journeys, and weakens informal support networks due to neighbour turnover. These changes affect mothers' wellbeing, contributing to frustration, isolation, and psychological distress. For children and adolescents, reduced access to safe outdoor spaces and the lack of neighbouring peers limit play and socialisation, hindering the development of skills such as communication, cooperation, and autonomy. Touristification, combined with persistent patriarchal structures, amplifies inequalities that particularly affect mothers and caregivers. Gender-sensitive planning and tourism policies are therefore needed to protect care infrastructures and support everyday life in touristified neighbourhoods.



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2161 - The Fragmenting Paper Of Gated Communities. A Study Case In Spanish Cities.

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Gated communities constitute a form of urban fragmentation that has been widely studied and has spread across the globe, originating in the United States in the second half of the twentieth century and rapidly expanding worldwide in parallel with processes of suburbanization and metropolization. These urban morphologies originally developed under conditions shaped by security concerns, social isolation, and a clearly defined planning logic; however, in the Iberian Peninsula, this phenomenon has emerged under far more heterogeneous conditions.

Drawing on an original database of residential developments across four metropolitan municipalities in the urban regions of Palma and Barcelona, this study examines the spatial logics, morphological configurations, and amenity structures associated with enclosed residential forms. The analysis critically engages with the applicability of the concept of gated communities in the Spanish context, interrogating its analytical limits and proposing a more nuanced understanding of enclosure, access control, and symbolic boundaries.

Findings reveal a high degree of morphological heterogeneity, shaped by temporal and locational factors. Rather than being primarily articulated around security concerns, these developments are more closely associated with imaginaries of tranquility, lifestyle differentiation, and social distinction. Within certain coastal and metropolitan environments, enclosed residential forms have become a dominant urban morphology, contributing to the consolidation and intensification of sociospatial inequalities and reinforcing processes of urban fragmentation in Mediterranean cities.



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3215 - Public Private Partnerships In Urban Parks In São Paulo And The Limits Of Access To Nature In Cities

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Public-private partnerships have, through the concession model, been consolidating as a growing practice in the management of public-use areas within protected natural areas in Brazil. Initially restricted to national parks of high touristic value, these practices have, in recent years, expanded to territories more closely linked to local and everyday use. Based on two case studies of urban parks in the São Paulo Metropolitan Region — namely, the Parque Estadual da Cantareira and Parque do Trianon — the proposal aims to demonstrate the contradictions present in the discourses that promote concessions and their practices. The methodology involves the analysis of concession contracts, public hearings, and news related to the partnerships in the parks under study. Although concessions result from the search for new forms of managing protected areas, within a neoliberal context, the model raises reflections on contemporary issues involving protected areas, since recurrent arguments in its promotion often minimize the role of the State and present private companies as a “solution” to the problems faced in managing these territories. The analysis of the results seeks to demonstrate that adherence to these policies often results in spatial, economic, and social practices that reproduce inequalities within protected territories. While at the level of discourse — disseminated by both public and private actors — they promote efficiency, service improvement, and ideas of sustainability, in practice they may generate processes of access elitization, marketization of nature, and a reduction in the role of the State in the promotion of public policies. These practices also reveal conflicts between different conceptions of protected territories: on the one hand, perspectives associated with environmental and cultural agencies, which emphasize preservation and access to nature as a common good; on the other, perspectives linked to private companies, which tend to treat them as merchandise.



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C24.17-Geography of Tourism, Leisure, and Global Change => Rethinking Tourism as a Site of Protest, Resistance and Political Action



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1059 - Tourism Encounters And Experiences To Conflict Ridden Sites In Bethlehem Palestine

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This study analyses people's emotional encounters when visiting sites associated with conflict in Palestine. The data were gathered from prominent travel blog websites. This study employs a range of qualitative and quantitative methodologies, including netnography, semantic network analysis, and content analysis, to gain a deeper understanding of visitors' emotions and experiences. These online narratives offer valuable insight into authentic, unprompted emotional responses that might not emerge through more traditional data collection methods. The analysis reveals a broad emotional spectrum, with visitors describing their experiences as sad, heartbreaking, depressing, heavy, eye-opening, and at times hopeful. These emotions arise from direct encounters with symbolic and material manifestations of the conflict, including the segregation wall in Bethlehem, refugee camps, and the Walled-Off Hotel. Despite the prevalence of negative affect, many visitors also reported feelings of hope, empathy, and moral reflection, indicating a complex emotional layering characteristic of conflict tourism, thereby generating innovative managerial and theoretical implications. To date, no academic research has focused specifically on emotional experiences at conflict-ridden tourist sites in Palestine. By examining visitors' emotional responses to the segregation wall, refugee camps, and the Walled Off Hotel, this paper addresses this notable gap and contributes valuable insights into how tourists emotionally engage with and interpret conflict landscapes. This paper aims to bridge the existing literature gap and provide valuable insights into the emotions and experiences that visitors elicit.



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1075 - Decolonizing Hospitality Through Volunteer Tourism

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Background / Hypothesis

Contemporary tourism continues to reproduce the epistemic and material hierarchies of coloniality, most visibly through the commodification of hospitality and the normalization of unequal host–guest relations. This study begins from the hypothesis that meaningful decolonial change in tourism cannot be achieved solely by reforming the industry; instead, the deeper ethical and relational practice of hospitality itself must be decolonized. Volunteer tourism—particularly Workaway-style, non-monetary exchanges—creates openings within the capitalist architecture of global tourism. These exchanges take place in intimate domestic settings where everyday coexistence, shared labor, and trust-based negotiation allow hosts and volunteers to encounter each other beyond the standardized expectations of commercial tourism.

Materials and Methods

This research is conceptual and draws on decolonial theory, critical hospitality scholarship, and Southern epistemologies. The analysis incorporates insights from Mignolo’s epistemic disobedience, Santos’s ecologies of knowledges, and non-Western cosmologies of hospitality. It is further informed by the author’s reflexive engagement with volunteer tourism contexts, used as interpretive material rather than empirical data. The goal is to theorize the epistemic and relational dynamics that emerge in volunteer tourism encounters and to establish a foundation for subsequent empirical fieldwork.

Results

The analysis identifies three interrelated dynamics through which volunteer tourism can fracture inherited colonial hierarchies:

- (1) Reconfigured South–North host–guest relations, where hosts may articulate agency and epistemic presence;
- (2) South–South encounters, enabling recognition grounded in shared histories and socio-ontological orientations;
- (3) Engagements with(in) Southern cosmologies, where relational, spiritual, and place-based understandings of hospitality challenge Eurocentric expectations.

These dynamics create border spaces in which embodied, situated modes of knowing unsettle the universalizing gaze of the modern traveler.

Conclusions

The study concludes that volunteer tourism—although limited and uneven—offers a meaningful site for reimagining hospitality as an ethical, relational, and socio-ontological practice. Such encounters support epistemic justice, facilitate the resurgence of marginalized cosmologies, and offer pathways toward more plural, non-extractive futures of mobility. This conceptual groundwork prepares the basis for future empirical research and contributes to broader geographical debates on decoloniality and planetary ethics.



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2743 - Conceptualizing Politicized Tourism Critical Debates

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Tourism is commonly described as a leisure activity shaped by market demand and destination appeal. Recent research has increasingly approached tourism as a political practice through which values, beliefs, and dissent are expressed. This shift has led to wider use of the concept of ‘politicized tourism’, yet the term remains weakly specified and often applied without clear theoretical grounding. This paper offers a critical review of politicized tourism research by situating it within political consumerism theory. Political consumerism theory understands consumption as a form of political participation, where individuals act on ethical and political concerns through marketplace choices. Applied to tourism, this perspective highlights how travel decisions become a means of expressing approval, refusal, or protest. Politicized tourism can therefore be defined as tourism-related practices in which political and ethical positions shape destination choice, travel avoidance, and engagement with tourism services. These practices include boycotts linked to political, environmental, or social concerns; buycotts that support tourism providers aligned with ethical practices; discursive engagement that shapes narratives around tourism ethics and governance; and lifestyle-based travel choices reflecting longer-term value commitments.

The review shows that much of the literature relies heavily on a consumer-focused understanding of political action. Tourists are often treated as central political actors, with emphasis placed on motivation and individual responsibility. While this approach has expanded discussion of ethics and agency in tourism, it also creates limits. By focusing on individualized action, existing studies often overlook structural conditions such as state policy, corporate power, labor relations, and unequal access to resources shaping tourism systems. As a result, political action is frequently framed as symbolic rather than material.

The review also identifies a narrow treatment of resistance. Research grounded in political consumerism theory tends to prioritise boycott participation and online activism, while giving less attention to struggles by local communities and Indigenous groups who contest tourism development itself. These struggles are often treated as background context rather than central political projects.



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C24.17-Geography of Tourism, Leisure, and Global Change => Rural Tourism Geographies: Toward New Rural Futures



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1210 - Local Identity As A Driver Of Socially And Environmentally Sustainable Development

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Background/Hypothesis

Local identity, rooted in place-based culture, heritage, and social practices, is increasingly recognized as a key driver of sustainable development. Previous research suggests that communities with strong local identities exhibit higher levels of social cohesion, environmental stewardship, and economic resilience. This study hypothesizes that strengthening local identities positively contributes to sustainability outcomes by aligning development strategies with local values, knowledge systems, and participatory governance.

Materials and Methods

The research employed a mixed-methods approach that combines qualitative and quantitative data. The case studies were conducted in three territorially diverse communities with active local development initiatives. Data collection included semi-structured interviews with local stakeholders, surveys measuring perceived attachment to identity and sustainability indicators, and document analysis of local policy frameworks. Analytical methods included thematic analysis of qualitative data and multivariate regression to examine the relationships between the strength of regional identity and indicators of social, environmental, and economic sustainability.

Results

The results indicate a statistically significant relationship between a strong local identity and improved sustainability outcomes. Communities with higher levels of attachment to place and cultural continuity showed greater civic participation, more effective environmental management practices, and more substantial support for local economies. Qualitative results revealed that local narratives and traditions function as mechanisms for intergenerational knowledge transfer and collective action, strengthening sustainable behavior. In contrast, weaker identity cohesion is correlated with fragmented governance and lower long-term project sustainability.

Conclusions

The outcomes support the hypothesis that strengthening local identities is a fundamental component of sustainable development. Policies and planning processes that integrate cultural heritage, local knowledge, and community participation are more likely to achieve lasting sustainability outcomes. These findings are consistent with the existing academic literature, which emphasizes endogenous development and cultural sustainability, highlighting the need for contextually sensitive, locally grounded approaches rather than standardized, externally driven models.



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1475 - Synergistic Evolution Of Homestay Tourism Entrepreneurial Ecosystems And Rural Areas

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Because Homestay is the industrial grip for promoting rural revitalization and entrepreneurship is the key driver of economic growth, it is of great theoretical and practical importance to give attention to the synergistic evolution of Homestay entrepreneurship and rural areas. This article proposes a framework for analysing the process of the rural Homestay entrepreneurship ecosystem on the basis of the concept of a strict distinction between Homestay enterprises and Homestay entrepreneurship. It analyses the characteristics of the Homestay entrepreneurship ecosystem resource structure using Moganshan as an example, depicts the entrepreneurial resource flow and production process, and explicates the core mechanism of the synergistic evolution of the system and the region. This study revealed that (1) Homestay is an important practical method to build an entrepreneurial ecosystem through entrepreneurial resource flow to compensate for the shortcomings of the countryside. The rural lifestyle attracts Homestay start-ups, and the value of business opportunities triggers the inflow and creation of entrepreneurial resources to form the entrepreneurial ecosystem, which outputs three types of entrepreneurial activities, namely, business upgrading and iteration, entrepreneurial intermediary services, and brand alliance diffusion. (2) The rural environment promotes the innovation and growth of Homestay lifestyle entrepreneurship, and the entrepreneurial ecosystem process is driven by entrepreneurs' identification and creation of opportunity value in a dynamic context. (3) The entrepreneurial ecosystem process evolves synergistically with the rural area, which successively generates rural tourism and vacation opportunities, Homestay entrepreneurship incubation and green innovation entrepreneurship. Intermediary services, government regulation, and the cogovernance of the regional public brand by multiple networks are the key reasons for synergistic evolution. This article provides a reference for promoting rural policy innovation and entrepreneurship to promote high-quality rural development at the practical level and links evolutionary studies of entrepreneurship geography and tourism geography at the theoretical level, providing an analytical path for analyzing the path mechanism of Homestay and other emerging tourism elements to promote rural revitalization.



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1552 - Rural Landscape Design Based On Multimodal Large Models Collaborative Innovation Between Planners And Models

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Background / Hypothesis:

Rural landscapes are crucial for enhancing tourism experiences and promoting sustainable rural development. With the rapid advancement of digital technologies, artificial intelligence, particularly multimodal large models, shows significant potential in optimizing landscape evaluation and improving design efficiency in rural planning. This paper hypothesizes that a human-AI collaborative design framework based on such models can enhance the scientific rigor and intelligence of rural landscape design.

Materials and Methods:

First, key tasks of landscape design within rural tourism development were analyzed, leading to the establishment of a comprehensive data and knowledge system. This system includes an ontology of landscape elements, a classification framework, and a database of landscape standards. Second, two core models were developed: a multimodal rural landscape evaluation model and a landscape design generation/optimization model. The evaluation model employs a multimodal encoder (e.g., CLIP) augmented with text knowledge for efficient landscape assessment. The design model integrates image editing and text generation techniques to automate the creation and refinement of tourism site landscapes.

Results:

Through multiple case studies, the human-AI collaborative approach demonstrated significant effectiveness. It substantially improved design efficiency and ensured greater landscape consistency. The framework successfully facilitated a synergistic workflow between planners and AI, translating analytical insights into actionable design optimizations.

Conclusions:

The proposed method advances the intelligence of rural landscape design. However, current models exhibit limitations in handling complex spatial relationships and dynamic 3D contexts. Future development should integrate 3D modeling, GIS technology, and self-supervised learning to further enhance model applicability and robustness. Such advancements will broaden the potential of AI-assisted planning, ultimately supporting the sustainable development of rural tourism.



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1640 - Revitalizing Geocultural Villages Through Neo Endogenous Development A Cross Case Analysis Of Sustainability Pathways In Zhejiang Province China

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This study aims to empirically examine how local rural areas can be revitalized through a neo-endogenous development model grounded in geological resource endowments. To achieve this objective, it integrates semi-quantitative scoring, cross-case comparison, and theory-based pattern matching to systematically examine how different configurations of neo-endogenous development factors shape sustainable rural transformation in small-N case studies. Drawing on the neo-endogenous development framework, this study develops five analytical dimensions to guide the analysis: local resource endowment, local economic activities, local governance and institutions, community agency, and external support.

Through the 2025 investigation of three pilot geocultural villages in Zhejiang Province, China, the comparative analysis reveals that distinctive geological resources and characteristic agriculture form the critical development basis. More importantly, the analysis demonstrates that, while sustainable development encompasses environmental, economic, and social dimensions, environmental improvement and socioeconomic development are driven by different mechanisms. Environmental improvement depends largely on effective local governance and external support, while socioeconomic sustainability is driven by the co-evolution of local economic activities and community agency. Further, local private entrepreneurs act as “key persons” by mobilizing private capital, connecting external resources with local needs, and strengthening collective action. These findings indicate that sustainable geocultural village development relies on locally rooted initiatives supported by appropriate institutional frameworks and external networks.



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1828 - Imaginary And Materiality Of Sugar Shacking In Québec Canada

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In 2021, the Québec government gives to Le temps des sucres (that we could translate as Maple syrup seasons) the status of intangible heritage. Maple syrup, and its derivative like sugar and toffee, play an important role in the rural heritage of Quebec, as still today its the main producers of maple syrup in the world. As a heritage practice, we could expect that the experience of the sugar party at the sugar shack would develop into a signature tourism experience, but today it is still linked with the tourism industry in subtle and discreet ways. The conference will explore the assemblage (Deleuze & Guattari, 1980) of the sugar shack with tourism, rural territory and history/tradition.

We will first offer a resume of the place of making maple syrup and sugar in the time and space of rural areas in Québec, then we will link it to the spatiality of maples and tourism, to close with a discourse analysis of regulations and representations at play within the tourism oriented sugar shack. We will conclude with an assemblage analysis of the territorialisation, deterritorialization of the practice of sugar shacking in the tourism context as a space of translation between tourism, territory and history.



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1866 - Rural Tourism And Revitalisation Creative Destruction Or Creative Enhancement

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In this paper, I reference and underline my discussion employing Claire Mitchell's (2013) seminal entreaty, Creative destruction or creative enhancement? Understanding the transformation of rural spaces. The term creative destruction was coined by Joseph Schumpeter in 1942, where he outlined the trajectory in which innovations are inevitable as progress renders former ways of doing things and related technologies and processes are no longer efficient and viable. In a sense, the commonplace pursuit to revitalise rural places epitomises Schumpeter's theorising, where once vibrant rural communities have become a shadow of themselves as industrial transformation, urbanisation and depopulation processes have become established patterns. Accordingly, Mitchell's submission of the term creative enhancement offers an advance on Schumpeter's nomenclature, highlighting that creative destruction may be better represented by creative enhancement - an alternative that hints at productive and beneficial processes that acknowledge the variations across rural contexts. I apply creative enhancement thinking in Japanese and Australian contexts and submit a theoretical framing that foregrounds the role that creative and entrepreneurial cultures can play in the broader rural revitalisation agenda.

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2193 - Tourism And Political Centralization Indigenous Protests In Russia's Rural Altai Republic **Ruth Remmers**¹

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Policy changes by the governor of the Russia's Altai Republic may lead to land dispossession for rural residents. The Moscow-appointed governor and business interests favor establishing additional elite tourism facilities, which provide tourism taxes for the economically disadvantaged region. The governor began changes in 2025 to improve tax revenues, and to increase centralized governmental control. After launching the tourism business registration process for the republic, he advocated the demolition of unregistered businesses, which mainly affects small entrepreneurs residing rurally across the republic. He endorsed the abolition of representational government across rural areas, eliminating elected village and settlement councils, and replacing elected district center members with appointed deputies. The rural councils had previously managed the use of shared areas for residents.

Indigenous citizens conducted protests in 2025 in opposition to the governor's policy changes. Although the changes affected all residents of the republic, predominantly Indigenous persons voiced their objections. Indigenous people account for 35 percent of the republic's population. Demonstrators disagreed with the loss of rural representational government. They feared the loss of their homes, businesses, and lands. Protests communicated residents' concerns, however, the republic's assembly members, who largely align with the dominant political party, still approved the changes. The government punished Indigenous dissent leaders. Information was gathered through available literature.



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2403 - Tourism Climate Change Defense New Rural Futures Or Just Adjusting The Discourses

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Background

In December 2019, a new airport was inaugurated in the mountainous region of Dalarna, representing the first airport built in Sweden in over 20 years. The project was controversial, as it was promoted as a preferable alternative to railway development. Simultaneously, the same actors—tourism industry and local authorities—involved in the airport's construction introduced a vision to rebuild and extend the former railway line to Sälen. Sälen, with approximately 800 permanent residents, is the largest winter tourism destination in Scandinavia and the fourth largest globally.

Methods

This study employs a critical discourse analysis of local and national newspaper coverage of the Scandinavian Mountains Railway project. Articles published between 2018 and the present were retrieved from the Retriever database. A (meta)governance framework is applied to identify dominant power discourses shaping the planning process, to examine tourism's role within these discourses, and to explore how certain interests gain precedence over others.

Results

Preliminary findings reveal a close entanglement between local authorities, the destination management organization, and the tourism industry, which collectively drive the railway initiative. In contrast, national transport agencies operate within separate discursive frameworks. Key themes include climate change, tourist mobility, and freight transport, alongside tourism's role as a generator of employment, economic growth, and future prospects for the region. Over time, these discourses have shifted in response to geopolitical developments, particularly the war in Ukraine and Sweden's accession to NATO. The railway is increasingly framed as having a “dual-use” function, serving both civilian and defense purposes. This shift introduces new transnational actors, such as the EU and NATO, which local stakeholders strategically engage to strengthen their influence.

Conclusions

The analysis highlights the considerable autonomy of local actors, who demonstrate flexibility and self-organization by mobilizing multiple networks to advance their objectives. Combined with political fragmentation, this underscores governance failures and ongoing struggles among actors to assert metagovernance and shape the region's future.



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2483 - Literary Tourism And Rural Futures Rethinking Spatial Justice In Cultural Led Development

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As literary tourism increasingly drives rural transformation globally, critical questions emerge about whose futures are being created and for whom. This study examines the spatial politics of literary IP-driven rural tourism development in China, revealing tensions between tourism-oriented spatial production and community-centered rural futures. Through a tourism geography lens integrating spatial production theory and critical heritage studies, we analyze Qingxi Village (Hunan Province)—developed as a literary tourism destination leveraging writer Zhou Libo’s cultural legacy. Intensive fieldwork reveals how state-led literary tourism development produces exclusionary spatial outcomes. Tourism planning prioritizes aestheticized “display spaces” for visitor consumption (receiving 78% of investment across 35% of village area) while marginalizing residents’ living and productive spaces. Literary cultural capital is commodified through top-down mechanisms, with 89% of villagers unfamiliar with the writer’s works yet required to perform scripted heritage narratives. Tourism revenue distribution remains inequitable: corporations capture 76.5% while communities receive merely 8.3%, with residents relegated to low-wage service positions. Four critical conflicts emerge: economic marginalization despite tourism growth, cultural dispossession as official heritage discourse silences local memories, spatial displacement as tourism aesthetics restrict traditional livelihoods, and fractured place identity with only 31.2% of residents identifying with the imposed destination brand. These findings challenge romantic narratives of cultural tourism as rural panacea, exposing how extractive development models undermine sustainable rural futures. We propose alternative pathways emphasizing spatial justice, community ownership of cultural resources, participatory destination governance, and hybrid spaces integrating tourism economies with resilient local livelihoods. Rather than treating rural communities as backdrops for urban tourist consumption, inclusive literary tourism models can catalyze equitable rural futures where heritage, economic development, and community well-being converge. This research contributes conceptual frameworks for reimagining rural tourism geographies beyond neoliberal development paradigms.



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C24.17-Geography of Tourism, Leisure, and Global Change => Sustainable Tourism in the Era of Global Climate Change



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1718 - Luxury Wine Tourism And Rural Peripheries Territorial Restructuring Inequality And Community Futures In Mendoza's Uco Valley (argentina)

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Peripheral regions have become key laboratories for tourism-led transformation, where territorial marginality, demographic fragility and weak governance intersect with new development imaginaries. Within this landscape, wine tourism is emerging as a significant form of rural tourism in peripheries, frequently promoted as a strategy to revitalise declining agrarian regions, attract investment and generate economic resilience. However, it is suggested in the literature that the socio-spatial impacts of wine tourism are complex, uneven and often contradictory. In particular, when tourism development is driven by capital investment in undercapitalised territories, the “financialization of the rural” may deepen social breaches and reproduce an extractive regime founded on unequal access to resources and motilities.

This research investigates such dynamics potentially at play through the case of Mendoza's Uco Valley in Argentina — a rapidly expanding luxury wine tourism destination undergoing profound territorial restructuring. Building on conceptual debates around rural transformation, gentrification, mobility and peripheral development, the study examines how wine tourism reshapes land and water access, labour markets, governance arrangements, demographic patterns and senses of belonging.

The project applies a sequential exploratory mixed-methods design combining semi-structured interviews, participant observation, visual documentation and secondary data. Preliminary insights from the literature and contextual analysis indicate the emergence of contrasting territorial narratives in Mendoza: one centred on aestheticised landscapes, investment growth and experiential consumption, and another emphasising inequality, resource pressure, precarious labour and exclusion.

Situated alongside complementary cases in Priorat (Spain) and Vayots Dzor (Armenia), the study seeks to rethink tourism development in peripheries by highlighting how wine tourism can function not only as a development strategy, but also as a mechanism of socio-spatial restructuring. Ultimately, the research aims to contribute new conceptual and empirical perspectives on rural futures, community agency and justice in peripheral tourism geographies.



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1972 - Tourism Management In Protected Natural Areas Of Croatia Under Climate Change

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Background/Hypothesis

Climate plays a key role in shaping destination attractiveness and tourist decision-making, and its importance is expected to increase under conditions of global climate change. Climate change affects environmental conditions, tourism flows, infrastructure, and long-term destination sustainability. Increasing extreme weather events raise important questions regarding the resilience and adaptive capacity of tourist destinations. While previous research has predominantly focused on urban and coastal tourism, protected non-urban areas remain insufficiently explored. This study hypothesises that protected natural areas with different climatic and environmental characteristics face distinct climate-related tourism challenges and adaptation responses.

Materials and Methods

The research was conducted in three protected natural areas in Croatia: Plitvice Lakes National Park, Kopački Rit Nature Park, and the Vis Archipelago Geopark. These areas represent diverse natural-geographical settings and differ in tourism intensity. A qualitative approach was applied using 18 in-depth interviews with key stakeholders, including protected area managers, tourism organisations, local authorities, and environmental associations. The interviews focused on assessing the current state of tourism and stakeholders' understanding of the interrelationships between tourism, climate change, and sustainability within protected area management.

Results

The interviews revealed climate-related changes affecting tourism activities, natural values, communities, and management practices, including extreme weather events, hydrological changes, heat stress, and ecosystem vulnerability, which influence visitor behaviour. Stakeholder perceptions and knowledge of the climate-tourism relationship varied across groups: environmental NGOs demonstrated a clear understanding of climate impacts, while tourism organisations generally acknowledged their importance in more general terms. Each protected area applies context-specific adaptation approaches reflecting different climate hazards and tourism pressures, and planned measures to strengthen climate resilience were identified.

Conclusions

Climate change impacts on tourism and adaptation responses in protected natural areas are highly place-specific and closely linked to geographical characteristics and tourism intensity. Integrating climate adaptation into tourism planning and protected area management is essential for enhancing destination resilience. The research was conducted within the framework of the PACT-VIRA project.



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2053 - Green Infrastructure As A Key Element Of Climate Resilient Tourism Planning. An Approach To The Valencian Autonomous Region (Spain)

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The Valencian Autonomous Region is one of the most important tourist territories in Spain and it has been experiencing constant and intense human and urban pressure for decades, especially along its coastline. In addition, climate change is having significant effects on precipitation patterns (high intensity, torrential rains), seriously increasing the risk of flooding.

In this context, it is necessary to highlight the role of Green Infrastructure as a strategically planned and designed structure of natural and semi-natural areas incorporating green spaces and other terrestrial and marine elements. A remarkable aspect is its ability to perform multiple functions, including mitigation and adaptation to the effects of climate change, protection against natural hazards, conservation of biodiversity, improvement of citizens' wellbeing, and development of spaces for public and tourist-recreational use.

This is an exploratory, analytical and critical study based on a review of several planning instruments relating to Green Infrastructure in the Valencian Autonomous Region. It also examines plans and actions that consider tourism and recreational practices associated with nature tourism, especially in natural parks. The work will be carried out from a multi-scale approach (regional, supra-municipal, local, urban) in accordance with the concept of Green Infrastructure as an ecologically coherent network that requires coordination between different actors, governance performances and levels of competence operating in the territory.

Preliminary results indicate that there are numerous and varied land use policies and instruments, but they face multiple problems that limit their actual implementation, especially at the supra-municipal level. For example, there is little cooperation and coordination between administrations, a lack of social commitment and a rejection of territorial models based on criteria of sustainability and regulation of economic and urban growth. All this in a context in which elements such as natural parks are being promoted to boost tourism and recreational development and the potential of nature tourism as a tourist resource.



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2499 - Green And Digital Transformation In National Tourism Strategies Evidence From Türkiye Norway Ireland And Spain

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Background:

Sustainable tourism practices are increasingly essential to address the sector's potential negative externalities such as environmental degradation, gentrification and food waste. In response, policymakers have begun formulating tourism strategies that emphasize green and digital transformation. While the incorporation of green and digital narratives in national strategies might help sustainable restructuring of the industry, key questions remain regarding the specific green and digital skills emphasized and the types of regions that are prioritized.

Material and Methods:

In this study, we aim to explore these questions in national tourism strategy documents. Adopting a multiple case study design, we employ the Gioia methodology to inductively analyse relevant sections of tourism strategy documents with respect to green and digital transformation. The selected case studies are Turkey, Norway, Ireland and Spain. The cases are geographically diverse representing different regions of Europe while also enabling within-group comparisons based on shared characteristics (Norway vs Ireland and Turkey vs Spain). Through first-order, second-order and aggregate level coding, we seek to theorize how green and digital transformation narratives are constructed in strategy documents.

Results: Preliminary findings demonstrate diverse conceptualisations of green and digital skills in planning for the future of tourism industry while place-specific findings are yet to emerge.

Conclusion: The study will lead to targeted and country specific policy implications to accelerate green and digital transformation in tourism industry.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism and Community Resilience: Symbiosis and Conflicts in the Anthropocene



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1631 - The Impact Of Digital Technologies On The Resilience Of Rural Tourism Destinations Theoretical Framework And Research Review

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For rural communities with underdeveloped socioeconomic conditions and fragile environments, is digital technology a catalyst for inclusive growth or a driver that exacerbates new disparities? To answer this question, this study conducts a systematic review and identifies critical gaps in existing literature. Prior research predominantly relies on macro-level panel data or examines isolated factors within socio-ecological systems, failing to capture the integrated dynamics of rural tourism destinations. Moreover, prevailing resilience evaluation frameworks often overlook the interactions among different resilience attributes. Crucially, few studies analyse the comprehensive response of rural tourism subsystems to digital technology from a human-land relationship perspective, and even fewer investigate its impact on specific resilience attributes.

To bridge these gaps, the study constructs an analytical framework for the impact of digital technologies on the resilience of rural tourism destination systems, based on the perspective of human-land relationships. The study conceptualizes the rural tourism regional system as three interwoven subsystems: the farmer livelihood subsystem, the rural subsystem, and the enterprise subsystem. Based on these three subsystems, the level of digital technology is decomposed into digital literacy at the farmer level, digital governance at the community level, and digital operation at the enterprise level. The multidimensional resilience of rural tourism destinations is further decomposed into farmer livelihood resilience, community rural resilience, and enterprise enterprise resilience, revealing the multidimensional spatial effects and transmission mechanisms of digital technologies influencing the resilience of tourism destination systems.

This research contributes to enriching and developing the application scenarios of human-land relations theory and technology empowerment theory in rural tourism destinations, providing a useful reference for tourism geography research in the context of the digital turn in geography.



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1968 - Tourism Development And Quality Of Life In A Mountain Destination The Case Of The Zlatibor Region Serbia

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Background:

Tourism is a major driver of socio-spatial transformation, influencing economic, social, cultural, environmental, and institutional dimensions of local development. These effects are most evident at the community level, where residents' perceptions and support play a critical role in achieving sustainable tourism outcomes. This paper examines the relationship between tourism development and residents' quality of life in the Zlatibor region (Municipality of Čajetina), one of Serbia's leading mountain tourism destinations.

Materials and methods:

The study employs the standardized Tourism-Related Quality of Life Index (TQOL), analyzing residents' perceptions across 36 indicators evaluating the importance, satisfaction, and perceived impacts of tourism on different life domains. Factor analysis identifies six key domains shaping residents' quality of life: urban issues, public services, community well-being, way of life, political power, and other community-related issues.

Results:

Results indicate a high perceived importance of tourism-related factors ($M = 4.24$), alongside a moderate level of satisfaction ($M = 3.42$), suggesting existing development gaps. Overall perceptions of tourism impacts are positive ($M = 4.08$). The calculated Quality of Life (QOL) score (12.15/20.00) and Tourism-Related Quality of Life (TQOL) score (25.53/60.00) confirm tourism's significant but uneven contribution to socio-economic and socio-cultural conditions in the region.

Conclusions:

The findings highlight the complex role of tourism in shaping local quality of life in mountain destinations and underline the need for spatially sensitive planning and governance approaches. The results provide relevant insights for regional development strategies and contribute to broader geographical debates on sustainable tourism and community well-being.



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2744 - Revisiting Resilience Narratives In Sanctions Ridden Tourism Destinations

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Tourism destinations are increasingly exposed to overlapping forms of disruption, including climate change, political instability, and economic shocks. Among these pressures, international sanctions represent a distinct and underexplored form of crisis. Sanctions operate through long-term economic restriction, financial isolation, and regulatory uncertainty. Unlike sudden disasters, they produce slow and uneven harm that reshapes everyday life and economic activity. Despite their wide social effects, sanctions remain largely absent from research on tourism and resilience.

This paper addresses this gap by examining tourism and resilience in destinations subject to international sanctions. It argues that sanctions should be understood as a structurally produced condition of vulnerability rather than a temporary shock. Sanctions affect tourism through reduced mobility, limited investment, currency instability, declining purchasing power, and restricted access to global networks. At the same time, tourism is often promoted as a coping strategy or survival option for communities facing economic pressure. Such claims require critical examination.

Drawing on qualitative fieldwork conducted in Iran, this study examines how tourism operates under prolonged sanction conditions and how different actors respond to these constraints. The analysis focuses on local households, small tourism businesses, and community-based initiatives. It examines how people adjust their livelihoods, rework tourism practices, or withdraw from tourism altogether in response to economic instability and policy uncertainty. Attention is given to uneven effects shaped by gender, class, and place.

The findings suggest that tourism-related resilience under sanctions is limited and uneven. While tourism may provide short-term income or informal opportunities for some groups, it often reinforces precarity, insecure work, and dependence on unstable markets. Responsibility for coping is frequently shifted onto individuals and communities, while structural causes of vulnerability remain unaddressed. In this context, resilience appears less as recovery and more as endurance under constraint.

The paper questions policy narratives that frame tourism as an adaptive solution in sanctioned destinations. By highlighting sanctions as a political and economic condition, it calls for a more critical approach to tourism resilience that takes inequality, responsibility, and justice seriously.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism Geographies: From Global Dynamics to Local Transformations.



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1019 - Mapping The Mobility Of Social Media Travel Influencers

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Background

Tourism territories today face many challenges, including overtourism issues that generate tensions in their ecological and social landscapes. Among the causes of overtourism, scholars have identified social media-induced tourism to be an important factor. Social media, and particularly social media travel influencers, have a powerful effect on the decisions of tourists and their selection of destinations. Travel influencers promote certain destinations and contribute to their popularity, attracting massive attention. Accordingly, they work closely with tourism boards and businesses.

Materials and Methods

This research analyzes the travel patterns of travel influencers and their representation of tourism destinations on social media. It tackles the over and underrepresentation of tourism territories on Instagram and the potential ramifications on the touristification of places, the inequality in the distribution of tourism flows, and the tensions arising from this situation. Data from the top 100 travel influencers on Instagram during a three-year period (2022, 2023 and 2024) were used. The data were analyzed statistically and spatially through Geographical Information Systems.

Results

The mobility of travel influencers is quantified and mapped. The results show a great overrepresentation on social media of destinations located in photogenic, remote and inaccessible places. Territories like Antarctica or exclusive islands in the Pacific Ocean are extremely popular among travel influencers on Instagram, but also the urban global hubs of global tourism (e.g., London, Paris, Dubai) are quite present on the platform. Travel influencers show a clear hypermobility, which has environmental and social implications that are highlighted.

Conclusions

The results shed light on the dynamics of the online representation of tourism places. The calculated curation of content and the over and underrepresentation of territories reveals power dynamics and inequalities that are reflected in the overcrowding of places and derived ecological and social issues.



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1236 - Tourism Driven Gentrification In Rural Japan Foreign Capital And Community Decline In The Kitanomine Ski Area Furano City Hokkaido

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Research background

In recent years, increasing transnational capital investment and the diffusion of neoliberal policy frameworks have intensified debates over neighborhood change and tourism development. However, empirical studies have largely focused on urban neighborhoods in Western contexts, leaving rural and Asian settings underexplored. By examining the phenomenon of rapid aging in rural Japan, this study offers a new perspective on tourism-driven regional transformation, or gentrification, beyond these dominant analytical frameworks.

Materials and methods

From 2023 to 2025, we conducted detailed fieldwork in the study area of Kitanomine, a small or mid-sized ski area in Furano City, Hokkaido, which also functions as a residential neighborhood. The methodology encompasses document analyses, participant observation at community events, and semi-structured interviews with local residents and real-estate companies.

Results

Since the late 2010s, Kitanomine has experienced a rapid influx of foreign capital accompanied by sharply rising land prices. Zoning regulations under Japanese urban planning law have concentrated on real-estate transactions and tourism-oriented development for foreign investors and tourists within a specific zone. Foreign capital inflows have accelerated the indirect displacement of elderly residents from this zone. The inconvenience of living far from the city center, concerns about the gradual loss of neighboring households, and attractive purchase offers from foreign companies have led many to sell their homes. Therefore, community ties have weakened significantly, reflected in a decline of approximately 40 percent in neighborhood association membership between 2018 and 2025.

Conclusions

This case demonstrates how foreign capital inflows reshape not only land and asset values but also the social foundations of rural communities perceived by foreign investors as having high tourism development potential in Japan's aging society. The findings offer insights into the future trajectories of other Japanese rural areas increasingly targeted for tourism development in the face of a weak yen and demographic decline.



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1255 - Host Guest Dynamics In Tourism A Systematic Literature Review

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background/hypothesis

The relationship between ‘guests’ and ‘hosts’ is a central aspect of tourism (Smith, 1989), shaping tourists’ experiences and residents’ perceptions of tourism and tourists (Sharpley, 2014). With increasing tourism pressure at the local level, this research field is highly relevant for tourism scholars and destination managers. Therefore, an overview of the current state of research on host-guest dynamics is required.

Based on a systematic literature review, the following hypotheses are tested:

- Research primarily focuses on residents, while tourists’ perspectives and studies integrating both viewpoints remain underrepresented.
- The concept of the resident is insufficiently defined in the literature on host-guest dynamics.
- Research identifies several variables affecting host-guest dynamics; however, these factors vary considerably between studies and are rarely integrated into a coherent analytical framework.
- Host-guest research is spatially and geographically uneven, with certain regions and types of destinations receiving disproportionate attention.

materials and methods

More than 300 articles focusing on host-guest dynamics published in nine leading international tourism journals up to July 2025 are analysed (Journal of Sustainable Tourism, Tourism Geographies, Current Issues in Tourism, Tourism Recreation Research, Annals of Tourism Research, Tourism Management, International Journal of Tourism Research, Journal of Travel Research, Tourism Economics). Article identification follows the PRISMA flowchart (Page et al., 2021). Data extraction and coding are AI-assisted using ChatGPT, supporting efficiency, reproducibility, and flexibility (Alshami et al., 2023, p. 30).

results

The research will be completed by June 2026. It will provide a comprehensive overview of prevailing research foci as well as spatial and conceptual research gaps in host-guest dynamics.

conclusions

Beyond substantive insights in the topic of host-guest dynamics, the use of ChatGPT offers methodological insights into the application of AI in systematic literature analysis. Subsequent stages of the doctoral project will involve an empirical analysis of resident-tourist dynamics in Palma, focusing on selected influencing variables in a coastal-urban destination.



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1271 - Specialty Coffee Shops And Urban Transformation In Madrid

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In recent years, specialty coffee shops have experienced a notable expansion in Madrid, becoming relevant spaces within urban circuits of consumption, sociability, and even cultural production. Far from being merely commercial venues, these establishments are embedded in broader processes of urban restructuring, linked to the symbolic revalorization of space, social differentiation, and the incorporation of specific neighborhoods into global dynamics such as touristification, gentrification, and foodification. From a critical geography perspective, this research is based on the hypothesis that the spatial distribution of specialty coffee cafés in Madrid not only reflects socio-economic transformations in the city center, but also actively participates in their reproduction and consolidation.

To analyze these dynamics, the study adopts a mixed-methods approach that combines quantitative and qualitative perspectives. First, Geographic Information Systems (GIS) are used to examine patterns of location and spatial concentration of specialty coffee shops, as well as their relationship with structural variables such as income levels, rental prices, tourism intensity, and proximity to cultural amenities. This spatial analysis is complemented by semi-structured interviews conducted in a selected group of establishments, aimed at exploring the discourses, practices, and urban representations produced within these spaces.

Preliminary findings suggest that the expansion of specialty coffee shops contributes to the material and symbolic redefinition of Madrid's central neighborhoods, reinforcing processes of social selectivity and exclusion associated with gentrification, touristification, and foodification. These establishments operate as devices of distinction and normalization of lifestyles, playing a significant role in the everyday production of urban space.

Using Madrid as a case study, this research seeks to provide a critical reading of the role of consumption and food culture in contemporary urban transformations. The results aim to contribute to debates in critical urban geography concerning the commodification of space, socio-spatial inequalities, and the global circulation of urban models in cities of Southern Europe.



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1335 - A Performativity Perspective On The Mechanism Of Tourism Territorialisation

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With the rise of tourism geopolitics research, tourism territorialisation studies have received increasing attention in recent years. However, existing studies are largely dominated by specific case analyses and lack systematic

theoretical exploration of the mechanisms through which tourism influences territorial processes and produces territorial effects. To address this gap, this article draws on performativity theory to construct a mechanism-based explanatory framework of tourism-performativity-territory, clarifying how tourism affects territorial processes and generates territorial effects. The article de-essentialises the existence of territory and argues that tourism is an everyday performative force shaping territorialisation. Repetition and citationality are the main mechanisms through which performances produce territorial effects. Diverse actors in complex territorial relational networks continuously cite dominant power norms, repeatedly implement exclusionary, bordering and differentiating performances in tourism practices, and sustainably accumulate facts of ownership and control over time and space, thereby gradually “doing” the power space effect of territory through long-term accumulation. However, because the structure of territorial networks, multi-actor interactions, and the market logic of tourism affect the implementation and sustainability of specific territorial performances, tourism-induced territorial effects are dynamic and uncertain, requiring continuous maintenance after their generation. The theoretical discussion in this article contributes to expanding research on tourism territorialisation, tourism geopolitics, and performativity, and helps enrich academic explanations at the mechanistic level of territorialisation.



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1615 - Adaptation Strategies And Alternatives In Tourism Destinations In Times Of Change Discussing Urban And Rural Areas.

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Even in a globalised context, tourism territories show high variability in front of crises and disruptive/sudden changes. This five-years research* has explored how urban and rural destinations perceive and assess situations like the COVID pandemic or the 2008 global financial crisis, and how these areas develop strategies aiming at improving their territorial resilience.

To explore the adaptation strategies developed from the stakeholders' perspective (public and private, civil society, etc.), this research has considered the internal dynamics, existing governance mechanisms, social capital and local management capacity, as well as internal and relational cohesion factors. Based on documental analysis, in-depth interviews and the extraction of images shared via Instagram, this proposal summarises the results obtained in the cases of Barcelona (urban destination in Spain) and Pays de Nay (rural destination in the Pyrenees).

The triangulation of the different methods have resulted in updated territorial reports, deeper understanding of the perceptions of different stakeholders based on their role at the destination (interviews), the information that was published in the media between 2020-24 (news) or in social media (Instagram), as well as the strategies that have been planned and implemented (policies, etc.).

The main goal of this project was to analyse, assess and propose adaptation strategies for tourism destinations when facing situations of crisis. Our results show that, for both types of destinations, perceiving changes as challenges, understanding the nature and scope of the strategies planned to address these challenges, and the role of stakeholders and the actors' networks emerge as key aspects to increase territorial resilience. This proposal will conclude with a list of recommendations, for both urban and inland areas, to face global crises in local contexts and walk towards adequate tourism scenarios aligned with ecosocial principles.

*Grant PID2020-114186RB-C22 funded by MCIN-AEI/ 10.13039/50110001103 and SGR GRATTS 2021SGR0214.



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1617 - The Expansion Of Airbnb And The Interiorization Of Tourism In Brazil

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Introduction: This study analyzes how Airbnb has been redefining tourism in small and medium-sized cities in the interior of Northeast Brazil. The hypothesis guiding the work is that the platformization of the economy has contributed to the expansion of tourism to the interior of the country.

Materials and methods: The study investigated municipalities located in the interior of the Northeast region of Brazil (Guaramiranga/CE, Gravatá/PE and Lençóis/BA), which show a constant growth in the number of listings on the Airbnb accommodation platform. The methodology combined a literature review and analysis of secondary data available in the AirDNA database, the Brazilian Institute of Geography and Statistics, and the Brazilian Tourism Map.

Results: Despite the concentration of tourism on the coast of Northeast Brazil, its expansion to inland areas has been observed in recent decades. This movement is explained by several factors, such as public policies implemented by the federal government and the diffusion of the sustainability paradigm. The expansion of hosting platforms constitutes the third factor contributing to this process. The scarcity of traditional accommodation options is being met by properties registered on accommodation platforms aimed at satisfying tourist demand. Despite the relatively small number of accommodations (Guaramiranga and Gravatá), there has been an expansion of Airbnb listings in the three municipalities between January 2023 and January 2026 (Guaramiranga - 315.5%; Gravatá - 157.9%; Lençóis - 37.4%). The significant growth of Occasional Use Dwellings (second homes) in the analyzed municipalities indicates a correlation with platform-listed properties.

Conclusion: The data show that the platformization of the economy, through Airbnb, has boosted the interiorization of tourism in the Brazilian Northeast, expanding the area of operation of the global economy with the inclusion of new actors in the tourism economy.



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1781 - Recent Evolution Of Second Homes In Brazil

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Introduction:

Second homes constitute a phenomenon involving economic, sociocultural, and spatial dimensions. From detached houses to housing units located in large urban-tourist complexes, second homes have become, under neoliberal and financialized capitalism, a phenomenon whose analysis demands a multi- and trans-scalar reading. This work aims to analyze the expansion of second homes in Brazil in the 21st century, considering local specificities, their typologies, as well as their relationship with tourism and short-term rentals linked to digital platforms.

Materials and methods:

The methodological procedures consisted of bibliographic and documentary research, whose main data source was the Demographic Census of the Brazilian Institute of Geography and Statistics (IBGE), through which it was possible to identify the temporal and spatial evolution of second homes in Brazilian territory. A series of maps was produced from census data from 2000, 2010, and 2022, and the analysis of these maps constitutes the core of this work.

Results:

There is a correlation between the expansion of second homes and Brazilian tourism. In the last two decades, both have grown significantly, and this movement has occurred towards the Central-West and North regions of the country, which constitute new spaces for the expansion of investments for speculative capital linked to the real estate and service sectors.

Conclusion:

In times of financialization and platformization of the economy, second homes have become a business for real estate investors, deepening a process underway since the 1970s. In the Brazilian case, despite the strong concentration along the coast, a process of inland expansion of second homes was evident during the analyzed period. The dissemination of properties intended for short-term rentals boosted the growth of this type of property, which also began to assume new meanings linked to the profitability it can provide to its owners.



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1901 - Developing A New Indicator For Measuring Touristification A Proposal Based On The Local Scale

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Background

Touristification is defined as the functional and symbolic change of urban landscape, particularly evident in the context of high tourism pressure. It is a complex phenomenon that affects multiple destinations and causes a variegated array of negative effects on local societies and territories. However, measuring the degree of touristification of a given destination remains a remarkable challenge for researchers and policy makers alike. This research intends to develop a new touristification indicator aimed at measuring the tourism pressure beyond traditional tourism statistics. It is conceived for the local/municipal scale, and it is applied to a set of destinations from the Autonomous Region of Madrid (Spain). This new indicator has been coined as the Multidimensional Touristification Indicator (MTI).

Materials and Methods

To develop and apply the MTI, a set of variables were combined and statistically weighed. MTI combines statistics from official sources that provide data on tourism activity (tourist arrivals, overnights, accommodation offer, etc.) with population data and indicators of the popularity of tourism destinations on social media platforms. These data come from traditional statistics, but also novel sources such as online travel agencies, mobile phone data (geolocation of visitors) and social media.

Results

The results reveal that the selection of new variables not traditionally considered in literature can produce unexpected results. The touristification seems to be higher in smaller populations that are located in natural settings away from big urban areas or consolidated cultural destinations. The findings obtained show that tourism pressure can be extremely high in small rural destinations and that the online popularity of these places (especially since the COVID pandemic) has added extra pressure on them. However, we also find a high degree of touristification in urban destinations (Madrid city) and places that have been officially protected and promoted from a cultural standpoint.

Conclusions

The new indicator MTI sheds light on new ways of measuring touristification at the local scale. This is a critical step in identifying potential touristification issues and can be useful in the introduction of measures to control the undesirable ramifications of tourism activity.



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2153 - Landscape Wine And Tourism Promotion Disonances In The Institutional Image Of The Ribeira Sacra (galicia Spain)

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This research project analyses how the tourist image of Ribeira Sacra (Galicia) is constructed and communicated based on its wine heritage and wine tourism potential, in a context in which gastronomic and thematic tourism has become a key trend in inland destinations. It is proposed that wine, in addition to being a gastronomic product, is an element of identity and territory capable of structuring a distinctive tourism brand based on the landscape, tradition and culture associated with heroic viticulture.

The research focuses on the study of official tourism promotion carried out by the Xunta de Galicia and the Ribeira Sacra Tourism Consortium, using a mixed quantitative and qualitative approach: analysis of texts (18,413 words) and images from guides, brochures and websites, complemented by an analysis of digital visibility using Google Trends. The results show that the official tourist image is based mainly on the landscape and historical heritage, while gastronomy plays a marginal role. Although wine appears as a relevant resource, its promotion is linked more to the vineyard landscape than to specific wine tourism experiences (tastings, wineries, wine samplings), which are hardly mentioned in the institutional discourse.

There is a gap between the image projected and the tourist interests reflected in digital searches, where wine and catamarans occupy central positions. Our work concludes that wine tourism in the Ribeira Sacra is underutilised as an engine of sustainable development and highlights the need for coordinated strategies from a governance perspective that better integrate wine as a cultural and gastronomic experience, reinforcing the coherence between territorial identity, promotion and tourist demand.



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2167 - Tourism And Urban Peripheries. New Fronts Of Touristification In The City Of Madrid (spain)

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The rapid growth of visitors to urban tourism destinations in recent years has been accompanied by a spatial expansion of tourist activity beyond traditional cultural and historical districts. This process has led to the emergence of new areas of tourist interest within the urban periphery, reshaping the geography of tourism in contemporary cities. In this context, Madrid (Spain) provides a relevant case study to examine the dynamics of tourist valorization in peripheral urban neighborhoods. The expansion of tourism into these areas can be explained by a combination of factors, including public policies aimed at decentralizing tourism flows, the rise of new visitor profiles seeking “authentic” experiences beyond established tourist circuits, the adaptation and promotion of local resources as tourist attractions, and the diffusion of accommodation supply—particularly short-term tourist rentals—into peripheral districts.

The main objective of this paper is to analyze the scope and characteristics of tourism-driven transformation processes in the urban periphery of Madrid (Spain). The study adopts a predominantly qualitative methodological approach based on the systematic compilation of recent initiatives, projects, and interventions linked to tourism development in peripheral neighborhoods. Documentary analysis is complemented by the examination of socioeconomic indicators and tourism-related data, as well as fieldwork based on direct observation and on-site spatial analysis.

The results reveal the existence of peripheral spaces subject to varying degrees of tourism-related change. These transformations include functional shifts associated with the growth of leisure and recreational activities, social changes linked to early stages of gentrification, and processes of symbolic re-signification of urban space. In particular, tourism has contributed to the patrimonialization and valorization of what can be described as a “new peripheral heritage,” while also fostering the reconfiguration of previously stereotyped or stigmatized images of certain neighborhoods. The findings highlight the need to consider peripheral areas as emerging frontiers of urban touristification and as key spaces in current debates on sustainable and equitable urban tourism development.



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2568 - Evolutionary Pathways Of Mature Urban Destinations The Case Of Barcelona (2010 2025)

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Background / Hypothesis

Global tourism dynamics are reshaping mature urban destinations, where sustained international mobility generates persistent pressures that challenge traditional destination lifecycle models. Such models struggle to capture how multi-scalar forces, including governance and social contestation, interact within the complex and dynamic nature of destinations. Drawing on Evolutionary Economic Geography, this study examines the trajectory of Barcelona as a tourism destination from 2010 to 2025.

Materials and methods

A qualitative longitudinal design combines three empirical sources: documentary analysis of municipal and metropolitan policy documents and regulatory instruments; a participatory process (Barcelona CityLab); and semi-structured interviews with key stakeholders. This study adopts a path tracing methodology. This approach allows to reconstruct Barcelona's tourism governance trajectory, identifying critical junctures emerging from the interaction between global tourism dynamics and local regulatory and spatial responses.

Results

Findings highlight the pivotal role of agency in shaping Barcelona's evolutionary trajectory, marked by the politicization of tourism governance and the erosion of the social legitimacy of tourism-led growth. Escalating contestation over overtourism and the selective use of regulatory and data-driven instruments are evident. Governance responses combine incremental adjustment with attempts to recalibrate tourism's role in the urban economy, producing contested evolutionary pathways.

Conclusions

This study contributes to the growing body of research by applying EEG to examine the evolution of tourism destinations beyond linear lifecycle accounts. Its main innovation lies in operationalising an EEG lens in a highly complex urban destination, showing how agency enacted by a wide range of stakeholders, including political and social actors, shapes destination path development over time. By foregrounding governance as a key mediating mechanism between global tourism dynamics and local territorial change, this paper also advances debates in tourism geography on touristification, platform urbanism, and destination governance, highlighting how regulatory choices, institutional arrangements, and social mobilisation interact across scales to shape destination trajectories.



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2767 - The Vision Of Globalisation Meets The Reality Of Localisation – Reflections On The Process Of Undertaking Tourism Research

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Background:

Globalisation as a research phenomenon offers many opportunities including enhanced data sharing, novel interdisciplinary and cross-country perspectives and greater understanding of social complexity. However, with these opportunities come challenges, such as the potential for cultural misunderstandings, reinforcement of structural inequalities, amplification of power imbalances and ethnocentrism.

This paper presents one researcher's perspectives on the process of being involved in tourism and hospitality studies in three geographically and culturally distinct regions. Reflections centre on the struggle of reconciling the vision of globalisation in research with the lived reality of undertaking research both with fellow researchers and with communities embedded in their own socio-cultural local context.

Material and Methods:

Reflections draw on three ongoing studies. The first study, based in Vietnam focuses on the development of a mentoring programme for women entrepreneurs in tourism. The second is based in China and examines women's subjective career success in the hospitality sector. The third investigates a small Irish community's journey to world heritage designation. Two of the studies employ an action research approach while the third uses a qualitative research design.

Results and Conclusion:

Engaging in reflexivity and remaining constantly aware of one's own positionality as a researcher are essential strategies in navigating the complexities of cross-border research in a globalised world. Explicitly acknowledging power imbalances and actively asking and answering questions on socio cultural differences are also important tools in a researcher's arsenal. True collaboration, which may mean different things in different research contexts can also address some of the inherent challenges inherent in undertaking research through a globalisation-localisation lens.



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3184 - Spatial Spillovers Of Tourism Development Local Labour Markets Across Chilean Municipalities

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Tourism has become one of the most dynamic sectors of the global economy and a key driver of territorial transformation in many regions. As tourism expands, its economic impacts are not confined to individual destinations but often spread across neighbouring territories through labour markets, supply chains and spatial spillovers. Understanding how these dynamics shape local economic outcomes is therefore central to debates in economic geography and regional development.

This paper examines the spatial dynamics of tourism employment and wage bills across Chilean municipalities. While tourism is frequently promoted as a tool for local development, its capacity to generate broadly distributed economic benefits across territories remains an open empirical question. In particular, it is unclear whether tourism growth produces positive spillovers across local labour markets or instead reinforces spatial concentration and territorial inequality.

Using municipal-level data for Chile between 2013 and 2023, the study combines indicators of tourism specialization with spatial econometric techniques to analyse the distribution and diffusion of tourism-related employment and wage income. Location quotients are first used to identify municipalities with a high degree of tourism specialization. The analysis then applies spatial autocorrelation measures and spatial regression models to evaluate whether tourism-related labour market outcomes in one municipality are influenced by neighbouring territories.

Preliminary evidence indicates that tourism specialization is highly uneven across Chilean municipalities and displays considerable territorial volatility over time. While a group of municipalities shows persistent specialization in tourism activities, others enter or exit tourism specialization between 2013 and 2023, suggesting dynamic processes of territorial restructuring in local tourism economies.

The results reveal significant spatial clustering in tourism employment and wage bills, suggesting that tourism development tends to concentrate in specific territorial systems rather than spreading evenly across space. However, the analysis also identifies evidence of spatial spillovers between neighbouring municipalities, indicating that tourism can generate broader regional labour market linkages under certain conditions.

By providing new empirical evidence from Chile, the paper contributes to ongoing debates on tourism geographies, spatial inequality and the role of tourism in shaping local development trajectories in emerging tourism economies.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism Geographies: Personifying Interdisciplinarity



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1549 - Tourism Polycrisis And The Twin Transition Interdisciplinarity Personified

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Background/Hypothesis

Tourism is increasingly constituted within a condition of polycrisis marked by climate breakdown, geopolitical instability, digital acceleration and deepening sociospatial inequality. Within this conjuncture, the twin transition—green and digital—has emerged as a dominant framework in research and policy. This paper advances the notion that the tourism geographies field—situated at the intersection of people, place, space and environment—is uniquely positioned to interrogate the twin transition as a potentially spatially uneven, politically charged and relational process rather than a mere technological solutionism-driven pathway. By centring on questions of justice, power and responsibility, the paper also conceptualises interdisciplinarity in tourism geographies as a situated and embodied practice in the context of the twin transition.

Materials and Methods

This contribution is dialogically theory-advancing rather than empirical. It draws on a moderated interdisciplinary conversation structured around five thematic blocks—digitalisation and polycrisis; structures and sustainability transitions; power, inequality and control; knowledge and responsibility; and future imaginaries. The paper synthesises insights from political economy, political ecology, digital and economic geographies, mobilities research and critical tourism studies and is anchored within the NOUTUR Research Group's TWINTUR project (ref. PID2024-162019OB-I00).

Results

The paper generates three key conceptual contributions. Firstly, it reframes digitalisation in tourism as constitutive of the polycrisis itself, producing new algorithmic and data-driven geographies of extraction, visibility and exclusion across tourism spaces. Secondly, it demonstrates how green and digital transitions often intensify existing inequalities by operating through incumbent regimes of accumulation, sacrifice zones and precarious labour in tourism places. Thirdly, it foregrounds epistemological responsibility, showing how tourism research itself can be entangled in digital infrastructures and socio-environmental relations that demand reflexive historically and spatially grounded critique.

Conclusions

By aiming to personify interdisciplinarity through critical dialogue in a tourism geographies framework, the paper sets an agenda that foregrounds spatial justice, environmental responsibility and the politics of knowledge in navigating tourism futures in the midst of polycrisis and transitions.



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1875 - Social Licence And Tourism Geographies A Heuristic For Resilience Thinking

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Amidst enduring discourses, a noticeable absence in conversation threads concerning tourism and resilience thinking is the notion of social licence - more specifically, 'social licence to operate'. The concept of social licence has been applied extensively to enquiries into extractive industries, including mining, forestry, fisheries and agriculture. Owen and Kemp (2013) describe social licence as premised on the idea of informal or 'tacit' licensing, signalling the absence of a critical mass of public consent, which may range from reluctant acceptance to a relationship based on high levels of trust. Apropos, I apply the term to tourism and allied geographies and query how social licence might be employed as a heuristic to guide praxis and policy development, as well as theoretical development. My express intention is to propose and advocate for the integration of social licence thinking into the tourism and related geographies discourses, leveraging the three pillars of tourism geographies – people, place and space. Allied to social licence is the praxis-oriented social licence to operate (SLO) – a compact underlining the rules of engagement negotiated between instigators of development, usually public and/or private institutions, and relevant stakeholders with an interest in the resultant outcomes. The twin issues of social and ecological resilience and the protection of the commons and communities from irreversible and adverse outcomes are as important in tourism as they are in extractive endeavours and personify interdisciplinarity. For all the discussion about the impacts of tourism and measures to address adverse outcomes, the employment of social licence in policy and planning frameworks is largely muted. I argue that elevating social licence to operate (SLO) as a necessary tourism policy and planning heuristic can help underline the prosperity and sustainability of people and place, and resilience capacities. Social License is poised to feature more prominently in tourism geographies and mobilities research as we grapple with just how destination communities might address the power disparities between them and the global travel supply chain.



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2030 - Timespace Of Tourism And Boundary Practices A Case Of Setouchi Triennale In Japan

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This presentation attempts to apply practice theories—reconsidered and further developed since the late 1990s—to tourism studies from a geographical perspective. Over the past two decades, practice-theoretical research has gained a distinct and privileged position in many fields of applied research, where it has been used to reframe questions of social order, change, and everyday life (Blue, 2025). Although applications of practice theories in tourism studies are relatively rare and recent (Lamer et al., 2017), they demonstrate the merits of practice theories (Bargeman et al., 2016; Rantala, 2010).

This intellectual lineage is underpinned by “The Practice Turn in Contemporary Theory” (Schatzki et al., 2001). Schatzki’s practice theory advances a flat social ontology, which entails that practice theories accept no stratification of social reality: the constitution of society evolves through, and takes the form of, a myriad of interconnected social practices being (re)produced in time and space (Schatzki, 2016). He also introduces the idea of orchestration, arguing that places and paths are orchestrated and are non-independently anchored for different people at the same material arrangement (Schatzki, 2017). In applying his practice theory to geographically informed tourism research, this presentation examines boundary practices through which people move among different positions such as visitors and locals.

This presentation explores these boundary practices in tourism spaces through a case study of the Setouchi Triennale in Japan, which is held every three years in the Setouchi region. Overall, this study shows the potential to help deepen understanding of tourism, especially tourism spaces, through a practice-theoretical lens.



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2749 - Limits Of A Tourist Destination According To Instagram Posts

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Destination image plays a vital role in tourism development, as it significantly influences the tourists' decision-making process and their perceptions of places (Beerli & Martín, 2004). A positive image can help a destination to attract and maintain tourists and to stand out in a highly competitive international market (Lai & Li, 2016). This explains the increasing investments in tourism marketing, and the fast rise of online and social media promotion in the last years (Larionova et al., 2015).

A major contribution of social media was the shift of influence power from official authorities to common users, significantly changing the way people travel and perceive destinations (Wang & Huang, 2022). Nowadays tourists rely more and more on User-Generated Content (UGC) before, during and after their trips, making social media platforms their travel inspiration boards and sources of alternative spatial representations (Razak & Mansor, 2021). Given the major role of marketing narratives in creating and promoting tourist destinations (Hall, 1997), social media actively transforms old spatial representations of places, beyond administrative and historical definitions, making the understanding and limits of tourist destinations (or regions) more and more fluid.

This paper uses geolocated Instagram posts to explore the way Instagram shapes spatial perceptions of a tourism destination beyond its historical and administrative limits.

The results reinforce the complex and fluid nature of tourism destinations as products of various marketing narratives. They reveal a mental territorialization that follows the most popular travel itineraries and the main concentrations of tourist attractions and services along transport axes, with a low impact of seasonality. Marketing narratives and personal visitor experiences prevail in shaping spatial representations, rather than geographical and historical factors, leaving many peripheral areas underrepresented. The study highlights a dynamic and experiential reality much needed for destination management and promotion strategies.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism Geography in the Age of Artificial Intelligence: Rethinking Human–Environment Interactions in a Digital Era



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1177 - Rethinking Tourism Space And Place In The Age Of Artificial Intelligence A Human-machine-place Co Construction Framework

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Tourism geographies have traditionally conceptualized spaces and places as products of human mobility, cultural representation, and experiential practice. However, the accelerating integration of artificial intelligence into tourism platforms, destination management systems, and urban tourism infrastructures fundamentally unsettles this human-centered understanding of space and place. While existing tourism research largely treats artificial intelligence as a functional tool for service optimization or experience enhancement, this study advances the theoretical proposition that artificial intelligence increasingly operates as an active agent in shaping tourism space, tourist behavior, and place meaning. We adopt a theory-driven conceptual approach that integrates tourism geography, human-environment relations theory, and actor-network theory. Through comparative theoretical synthesis across urban tourism and destination contexts, the study develops a five-stage evolutionary framework to conceptualize varying depths of artificial intelligence intervention in tourism spatial systems. The framework identifies five configurations of tourism space and place: assisted tourism space, algorithmic tourism space, responsive tourism environments, augmented tourism places, and generative tourism territories. Across these stages, artificial intelligence evolves from an informational navigator to a structural organizer, adaptive co-actor, experiential narrator, and ultimately a generative architect of tourism spatial order. This evolution corresponds with profound shifts in tourism spatial visibility, tourist movement patterns, destination governance, and mechanisms of place meaning formation. The study concludes that tourism spaces and places should no longer be understood as exclusively human-produced. Instead, tourism spatial production is increasingly shaped through human-machine-place co-construction processes. By reconceptualizing tourism space as an evolving, multi-actor system, this framework contributes to critical tourism geography debates on algorithmic mediation, destination transformation, and the future of tourist-place relations in artificial intelligence-mediated environments.



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1254 - An Exploration Of The Potential Use Of Service Robots Among Millennials And Gen Z's In Nature Based Tourism Destinations

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This paper assesses the future potential of service robots in nature-based tourism in South Africa, focusing on their possible roles, appearance and effects on guest experiences and nature-based destinations. Online in-depth interviews with 40 younger respondents (Millennials and Generation Z) were conducted to examine perceptions of service robots and the data were analysed using thematic analysis. The findings indicate that interviewees were cautious and uncertain about the future role of service robots in nature-based tourism, with key concerns relating to the potential impact of robots on employment in the Global South and questions about whether robots should adopt human or animal-like forms. In addition, respondents noted that tourism providers should avoid creating the impression that robots are replacing human workers and should remain sensitive to guests' attitudes towards nature when deploying robotic technologies. This is the first study to examine the role of robots in nature-based tourism and to analyse the delicate relationships between human workers, robots and other non-human actors in a Global South context. The paper contributes by examining the attitudes of younger tourists, who will be critical to future acceptance of robotic technologies, and by addressing the current geographical imbalance in the literature. Further research is needed to better understand the consequences of service robot adoption for tourism destinations.



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1324 - Tourist As Drone Operators Profiles Uses Challenges And The Autonomous Drone Mobility Future

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This article offers a critical examination of tourists as drone operators, analysing who uses drones, how they use them, and the implications of their increasing presence in tourism spaces. Drawing on a critical review of 204 publications, the paper identifies distinct user profiles and reveals how drones are mobilised for sightseeing, aerial exploration, first-person-view immersion, and creative image production. While drones can expand sensory engagement with destinations and support environmental monitoring, their integration into tourism remains controversial. Technological complexity, ecological disturbance, privacy anxieties, safety risks, and fragmented regulatory regimes collectively constrain mainstream adoption and public acceptance.

Against this backdrop, the paper situates tourism within emerging debates on autonomous drone mobility. It argues that automation may reduce operational barriers and potentially democratise access, yet may also intensify inequalities, reconfigure sociability, and introduce new governance dilemmas. Rather than treating automation as a technological fix, the article advances a research agenda centred on anticipation, design, use, and impacts on tourists, destinations, and regulatory frameworks. It calls for approaches that foreground human experience, social justice, environmental stewardship, and context-sensitive governance. In doing so, the paper positions autonomous drone mobility as both an opportunity and a dilemma, shaping how low-level airspaces may become shared, well-managed, and socially sustainable components of future tourism.



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1572 - Digital Leisure Engagement Among Chinese Older Adults Frequency Involvement And Their Differential Well Being Impacts

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Since the 1990s, the rapid advancement of information and communication technologies as positioned the technology-mediated enhancement of older adults' quality of life as a critical focus in gerontology and human-computer interaction. However, a significant gap remains in distinguishing the differential impacts of internet-based leisure activities from its utilitarian functions. Addressing the prevalent issues of "spatial isolation" and "social isolation" among Chinese older adults, this study investigates the role of "digital leisure spaces" in reshaping lifestyles and promoting well-being, aligning with national digital age-friendly and empowerment initiatives. Using cluster analysis and hierarchical regression, it investigates: 1) Subgroups based on digital leisure preferences, 2) Behavioral differences, and 3) Varying well-being mechanisms. This research identifies four distinct typologies based on digital leisure preferences: Passive Users (high-frequency passive consumption of videos/news), Social Users (platform-based interactions), Interactive Users (gaming/shopping), and Deep Users (learning/content creation). A comparative analysis reveals that while all groups share a high level of "attraction" to digital leisure, they generally exhibit low "centrality" in life and weak "self-expression". Crucially, Deep Users significantly outperform the other three groups on these latter two dimensions, demonstrating that profound engagement can transform digital leisure into a central life component and a vehicle for self-extension. Furthermore, the impact of digital leisure involvement on well-being presents a "shared-yet-differentiated" pattern. The depth of engagement emerged as the strongest predictor of well-being benefits, substantially outweighing the effects of mere frequency or duration. This relationship was further moderated by key socioeconomic factors—including personality traits, education, self-rated health, and family support—with the moderating effects varying significantly across the subgroups. The study concludes that digital leisure is a socially constructed, dynamic practice capable of alleviating loneliness and enhancing life quality. It strongly advocates for moving beyond generic, one-size-fits-all digital inclusion policies. Instead, tailored empowerment strategies should be developed, specifically designed to encourage a transition from passive consumption towards the active creation and deep engagement observed in the Deep User group, thereby maximizing positive well-being outcomes across this diverse population.



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1579 - The Multidimensional Impacts And Spatial Differences Of Internet On Service Consumption Among Chinese Residents

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As China's economy transitions into a stage of high-quality development, the residential consumption structure is accelerating its transformation towards diversification, higher quality, and an experiential orientation. In this context, service consumption is growing rapidly, emerging as a key driver of consumption upgrading and domestic demand expansion. With the proliferation of mobile internet, 5G networks, and digital technologies, the internet has profoundly reshaped residents' lifestyles. It has also provided new supply models, payment methods, and information channels for service consumption, significantly enhancing both the efficiency and convenience of consumption. However, existing research has predominantly focused on the impact of internet use on overall consumption, while paying insufficient attention to service consumption—a crucial domain that leads consumption upgrading. On the other hand, such analyses are often based on single dimensions and conducted at a micro-level, lacking systematic research on a national scale. This study utilizes data from the 2021 China Household Finance Survey and China Time Use Survey, covering 29 provinces nationwide, and examines internet use from three dimensions—mobile internet usage, internet usage duration, and internet-based lending frequency—to systematically analyze its multidimensional impact on residents' service consumption expenditure and time allocation, as well as the heterogeneity across regions and urban–rural areas. The results show that service consumption expenditure has steadily increased, with high-value areas concentrated in the eastern coastal and southwestern regions, while consumption time exhibits no clear spatial pattern. Mobile internet usage, longer internet usage duration, and higher internet lending frequency all significantly promote service consumption expenditure, with internet lending frequency exerting a slight positive effect on consumption time, whereas mobile internet usage does not significantly affect it. Furthermore, the effects of internet use vary significantly across regions and between urban and rural areas, with mobile internet usage having a stronger impact on residents in central and rural regions, and the effects of internet usage duration and lending frequency showing complex differences.



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1580 - Leisure Time Physical Activity And Subjective Well Being Among Chinese Elderly The Moderating Role Of The Mobile Internet

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As a key indicator for measuring individual quality of life, subjective well-being reflects a person's overall satisfaction with their life. Against the backdrop of an accelerating global aging process and the profound impact of the mobile internet on all aspects of elderly life, how to effectively enhance the subjective well-being of the elderly population has become a significant issue of public concern. This study utilizes data from the 2021 Chinese Time Use Survey, focusing on the elderly population nationwide. It analyzes the spatial distribution characteristics of the duration of leisure-time physical activity and subjective well-being among the elderly. Employing an Ordered Logit model, the study investigates the impact of the duration of leisure-time physical activity on the subjective well-being of the elderly, and further explores the potential role of the mobile internet in this relationship. The results indicate that: □The proportion of time spent on leisure-time physical activities among China's elderly exhibits a distribution pattern of being "higher in the north and lower in the south," marked by significant urban-rural disparity and a clear income gradient. In contrast, subjective well-being is characterized by a pattern of being "higher in the west and lower in the east," with urban-rural convergence and is optimal for middle-income groups. □The proportion of time dedicated to leisure-time physical activities significantly enhances the subjective well-being of the elderly, but the use of the mobile internet attenuates this positive effect to some extent. □The impact of the duration of leisure-time physical activity on the subjective well-being of the elderly varies significantly across different regions, between urban and rural areas, and among different income levels, with the enhancing effect being most pronounced for the elderly in central regions, urban areas, and high-income groups. This research provides a new perspective for improving the quality of life for the elderly, with the aim of more comprehensively and effectively promoting the well-being of this population and enhancing their overall life satisfaction.



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1620 - Analysis Of Transportation Tourismintegrated Landscapes Experience With Ai Intervention ——a Case Study Of Singapore Changi Airport

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As gateways connecting the world and core nodes of modern transportation systems, airports are evolving from single-function transport hubs into representative transportation-tourism integrated landscapes that accommodate multiple functions, including cultural expression, leisure, and consumption. This study takes Singapore Changi Airport, renowned for its excellence in global transportation-tourism integration practices, as a case study. User-generated content (UGC) related to Changi Airport was collected from major Chinese social media platforms (Sina Weibo and Xiaohongshu) as well as an international travel platform (TripAdvisor). Adopting the grounded theory method, the study employs the Claude large language model to analyze the textual data, with the aim of constructing a theoretical model of airport landscape tourism experience generation, so as to reveal the key elements of airport landscape perception, the dimensions of tourist experience, and the underlying mechanisms. The findings indicate that tourist experience is a dynamic chain process triggered by perceptions of the landscape attributes, including grand spectacles, natural ecology, and technological artistry, which subsequently gives rise to core tourism experiences across multiple dimensions encompassing emotional, behavioral, and cognitive aspects. This experiential process is moderated by service and environmental support systems, such as the integration of commercial atmosphere, the efficiency of operational management, and the human-centered design of facilities, ultimately generating diverse forms of tourism value, including memorable personal experiences, high-quality social capital, and distinctive cultural symbols. Furthermore, through a cross-cultural comparative analysis of comments from Chinese and international tourists, the study validates the general applicability of the model's core framework and reveals significant differences across cultural contexts in terms of emotional expression, behavioral patterns, cognitive reconstruction, and value orientations. The study provides both theoretical support and practical guidance for the transformation and upgrading of airports from traditional transportation nodes into comprehensive leisure-oriented landscape experience spaces.



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1653 - Waiting For Unique Sunrises Impact Of Sunrise Tourists' Time Perception On Their Aesthetic Experience

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Background and research questions:

Sunrise-sunset, as markers of the diurnal cycle, have long been mystical and sacred symbolism. They are increasingly consumed by current teenagers pursuing fashion and sense of ritual, thereby drawing attention from both national authorities and businesses. However, these meteorological landscapes are highly uncertain, often requiring tourists to invest significant time and patience in waiting. This raises several key questions: Why are tourists willing to spend time awaiting sunrise-sunset scenes? How does their time perception during the wait influence their aesthetic experience?

Theoretical analyses:

This study established measurement dimensions and indicators for tourists' time perception and aesthetic experience during sunrise viewing, based on psychological models of time perception and cognitive processes defined by aesthetic psychology. Then the impact of tourists' time perception on their aesthetic experience of sunrise was analyzed and hypothesized as follows:

H1: Tourists' expected waiting time (EWT) has a positive impact on their aesthetic experience.

H2: Tourists' perceived waiting time (PWT) has a negative impact on their aesthetic experience.

H3: Tourists' acceptable waiting time (AWT) mediates the impact of expected and perceived waiting time on aesthetic experience.

Materials and methods:

285 questionnaire data were collected via a two-phase, face-to-face survey from the sunrise tourists at Huangshan, China's first National Weather Park. PCA was used to validate the measurement dimensions of time perception and aesthetic experience. Mean score were applied to evaluate tourists' time perception and aesthetic experience at Huangshan. Then structural equation modeling was employed to test the impact of tourists' time perception on their aesthetic experience of sunrise.

Results and conclusions:

Tourists' expected waiting time scored the highest, while their aesthetic experience was moderate. Time perception was found to exert a dual-pathway influence on aesthetic experience: both EWT and PWT directly, positively and negatively respectively affected aesthetic experience, and they also imposed influences indirectly through AWT. Finally, based on the evaluation and analytical results, optimization strategies for managing sunrise tourism at Huangshan are proposed.



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1717 - Research On Real Time Emotion Measurement Technology For Tourists Based On Street View Images And Ai Facial Expression Recognition

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To accurately measure tourists' instantaneous emotions and address the limitations of traditional self-report methods, this study proposes a technical scheme integrating street view images and AI facial expression recognition. Street view images of urban tourist districts were collected via the Baidu Maps API and supplementary on-site shooting, with 4 multi-angle images captured per sampling point to ensure comprehensive environmental perception. The DeepLabv3+ model was adopted for semantic segmentation to quantify key spatial characteristics such as green view ratio, building proportion, and spatial openness; leveraging YOLOv8 for high-precision face detection and DeepFace for facial expression recognition, tourists' "smile" expressions were extracted to construct a smile index as a proxy indicator of instantaneous emotions. Independent samples t-tests were used to compare differences between spatial characteristics and the smile index, ArcGIS was employed to visualize the spatial distribution of emotions (identifying "emotional hotspots" and "emotional coldspots"), and multiple linear regression models were built to analyze the underlying influencing mechanisms. Questionnaire data were combined to verify the indicator validity. This study is expected to realize large-scale, non-intrusive measurement of tourists' instantaneous emotions, reveal the emotional differentiation laws and driving factors of different tourism spatial characteristics, and provide valuable technical support and theoretical reference for optimizing tourism spatial planning and enhancing experience quality.



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2481 - Romantic Geography And Astrophotography Nocturnal Landscape Experience And The Construction Of Place Meaning

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In the context of contemporary urbanization, astrophotography has emerged as an important practice through which individuals engage with cosmic scales and renegotiate relationships between self and space. Drawing on the conceptual framework of topophilia and the notion of polarized oppositions in Romantic Geography, this study explores the experiential characteristics of astrophotography and the mechanisms through which place meaning is constructed. Data were collected through a combination of online and offline approaches, including social media narratives produced by astrophotography enthusiasts, in-depth interviews, records of shooting processes, and photographic images and videos. Grounded theory was employed to code both textual and visual data, with particular attention to the interactions among emotion, place, and spatial experience within experiential narratives.

The findings indicate that astrophotography is not merely a technical or aesthetic activity, but a form of geographical practice imbued with Romantic qualities. Photographers continuously experience and negotiate multiple polar tensions—such as the infinity of the universe and the smallness of the self, the darkness of the night sky and the brightness of celestial bodies, and the contrast between cold environments and warm, embodied presence. In this process, emotional attachments to places and companions gradually emerge through waiting, uncertainty, and bodily exposure during nocturnal shooting practices. As a result, the starry sky is transformed from an abstract landscape into a personally meaningful place, completing the romanticization of landscape and the construction of place meaning. This study extends the empirical applicability of Romantic Geography in contemporary leisure and visual practice research, and offers theoretical insights for understanding stargazing tourism and dark-sky landscape experiences from a Romantic geographical perspective.



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C24.19-Geomorphology and Society: Past, Present and Future (Jointly with International Association of Geomorphologists) => Geomorphology and Society



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1232 - Japanese Geomorphology For Rigorous Assessment Of Seismic Hazard A Case Study Of The 2024 Noto Peninsula Earthquake

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Background

The 2024 Noto Peninsula earthquake Mj7.5 was the largest intraplate earthquake in Japan in the past century, resulting in 684 fatalities. Despite geomorphological evidence of submarine active faults capable of triggering major earthquakes, the Japanese government did not issue any earthquake prediction or warning, leaving residents unaware of the seismic risk.

Method

This study reviews geomorphological research conducted on the Noto Peninsula before and after the 2024 earthquake, focusing on its relevance to seismic hazard assessment.

Results

Five key studies are highlighted:

Ota (1975) identified unusually elevated marine terraces in northern Noto and inferred the existence of offshore active faults.

Goto (2014) analyzed submarine topography and argued that the fault could generate a magnitude 7.5+ earthquake, criticizing earlier offshore seismic surveys that estimated its length at only 30 km.

Goto et al. (2025) documented over 4 meters of uplift caused by the 2024 event, based on geomorphological evidence.

Suzuki and Watanabe (2024) reported that some onshore active faults were also triggered.

Suzuki et al. (2025) detected active faults within the premises of a nuclear power plant using aerial photograph interpretation.

Conclusion

Geomorphologists have pointed out the presence of active faults in northern Noto since the 1970s, yet their findings were underestimated in seismic assessments, particularly those related to nuclear facilities. The absence of sufficient warning before the 2024 earthquake may be partly due to this oversight. It is problematic that geomorphologists in Japan have not taken a more proactive role in communicating these seismic hazards to the public.



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1318 - Integrating Sar And Optical Imagery To Enhance Logitide2dem For Intertidal Topography Reconstruction At Seasonal And Event Timescales

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Intertidal topography serves as a dynamic interface between marine and terrestrial systems, playing a critical role in ecosystem health, socio-economic activities, and coastal erosion mitigation. Conventionally, mapping these environments relies on constructing digital elevation models (DEMs) using multi-temporal optical satellite imagery constrained by tidal height records. However, reliance on optical data alone severely limits monitoring capability, as frequent cloud cover often hinders the acquisition of sufficient observations to reconstruct topography at high temporal resolutions.

This study advances the LogiTide2DEM framework by integrating Sentinel-1 Synthetic Aperture Radar (SAR) imagery with multiple optical datasets, including Sentinel-2, Landsat, and the SPOT series. Both SAR and optical images were classified into water and land using a machine-learning-based approach. These binary classifications, together with corresponding tidal heights, were subsequently incorporated into a logistic regression model to estimate intertidal surface elevation. The framework was applied to the Changhua coast of western Taiwan, a 5-km-wide tidal-flat system undergoing rapid geomorphic changes driven by extreme events and human interventions such as offshore wind infrastructure.

The results show that integrating SAR imagery improves the temporal resolution of topographic reconstruction from an annual scale to intervals of 2–3 months. This enhancement enables the precise capture of morphological changes induced by the 2024 Typhoon Gaemi and groin effects. By analyzing the combined impacts of typhoon disturbance, seasonal monsoons, and coastal development projects, this research systematically evaluates tidal-flat evolution and its implications for oyster aquaculture. These findings demonstrate that the synergistic use of active (SAR) and passive (optical) remote sensing provides a scalable solution for monitoring complex coastal dynamics under increasing climatic and anthropogenic pressures.



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2433 - Changes In Flood Limits In Kraków City Centre (poland) Caused By Anthropogenic Land Transformations In The Last Millennium

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Assessing flood risk is of fundamental importance for the proper protection of historic city centres. Therefore trends in the vertical and horizontal flood limits of the River Vistula within the alluvial plain in the centre of Kraków (Poland) from 10th c. to modern times have been researched and identified. The height of flood waters was following an upward trend until the 17th c. and a slightly declining trend in later centuries. The growing heights of Kraków's urban embankments and the gradual increase in the elevation of the flood control levees have decreased the flood limits in the city centre. Since the mid-20th c., overbank water stages in the river have only been recorded within the interlevee zone and not beyond it, and the mean duration of flood events has been shortened to five days a year. Since the mid-20th c. there has been an upward trend in the maximum water stages of the Vistula in the centre of Kraków during the largest floods that have not to date overflowed the flood control levees. Recently, this process has been slowing down under the influence of water-retaining dams on the upstream mountain tributaries of the Vistula. The research was based, among other, on present-day and archival maps and spatial data, on the basis of which maps and models of the study area were developed using GIS and geostatistical tools. Use was made of a digital elevation model (DEM) with a spatial resolution of 1 m in the ETRS89/Poland CS92 coordinate system (EPSG: 2180) and in the PL-KRON86-NH height system. The DEM made it possible for the former and current hypsometry and the former and current relief of the study area to be visualised on a hypsometric map with the contour interval of 2.5 m.



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2502 - Large Scale Mapping Of The Land Cover Of The Geghama Ridge (armenia) Using Machine Learning Tools For The Classification Of Volcanic Deposits

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The volcanic formations of the Gegham Ridge in Armenia are of interest for studying magmatism and relief evolution, but they have not yet been mapped in detail. The large number of volcanic (scoria) cones and the complex structure of lava flows, combined with heterogeneous ground cover, including fragmented vegetation, complicate image interpretation. The combination of multispectral satellite data (Sentinel 2, PlanetScope, Resurs-P), UAV survey materials, digital terrain models, and machine learning methods enables greater detail, accuracy, and scale in maps of volcanic deposits in the Geghama Ridge.

Space imagery was processed mainly using automatic classification tools and spectral index analysis. UAV imagery underwent photogrammetric processing and three-dimensional analysis, including the calculation of morphometric indices and the generation of digital terrain models. Training samples were generated from multispectral features, indices, and morphometric parameters, after which machine learning algorithms were applied to classify land cover types and volcanic deposits and to automatically identify morphological elements of the relief.

Highly detailed land cover maps were compiled, including the entire Geghama Ridge and individual volcanic domes, on which lava flows of various types, slag deposits, cones, craters, and areas of debris deposits are clearly distinguished. The use of vegetation and special geological indices, combined with morphometry, enabled better distinction of lava by age, red, and black slag. The use of machine learning and image recognition tools enabled the identification of individual landforms and sites of exogenous processes, including barrancos, volcanic lakes, calderas, and faults.

The integration of multispectral data, digital terrain models, and machine learning methods has proven effective for large-scale mapping of volcanic deposits in the Geghama Ridge. This approach improves mapping and can be applied to other volcanic areas with limited field accessibility. Data integration and the compilation of large-scale thematic maps of the volcanic highlands have enabled a new level of geological mapping, enabling research across large areas using machine learning tools. The processes and phenomena mapped from remote sensing data not only develop interpretation methods but also enable the assessment of natural hazards in the studied area.



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2625 - Fluvial Geomorphology And Society Of Barakar River Basin Northeastern Chhotanagpur Plateau India

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A geomorphic unit e.g. 7th order Barakar drainage basin which covers major part of north-eastern Chhotanagpur plateau has been selected for research purpose. Barakar basin is extended inside latitude: 23° 40' 00" N to 24° 30' 00" N & longitude: 85° 15' 00" E to 86° 50' 00" E. The major objectives of this research are Terrain analysis on the basis of morphometry, drainage pattern, channel morphology, landforms and provenance characterization using Barakar river sediments. Paleoclimatic interpretation of Gondwana sedimentary basin lying in the study region is also an important objective. To draw above objectives Digital Elevation Model (DEM) has been generated with twenty-two CARTOSAT Stereo pair data. Further, Ortho-Image has been produced from this DEM for landforms mapping. DEM data has been utilized in morphometric analysis. The study reveals that remotely sensed data (CARTOSAT -DEM) and GIS based approach in evaluation of drainage morphometric parameters and their influence on landforms at river basin level is more appropriate than the conventional methods. Barakar river sediments are collected and processed for heavy minerals and grain size analysis. Barakar basin has dendritic to sub dendritic drainage pattern which suggests that the basin has homogeneous lithology, impermeable rock, horizontal bed, gentle regional slope and lack of structural control. The study region is tectonically stable since end of Mesozoic era; rapid erosion of source rocks indicates about tropical humid climate is presented now. Inselbergs, Valley fills and channel landforms are also signature of tropical humid/monsoon climate. It means the terrain embrace tropical climate in recent past. Three erosion surfaces are identified at the height of 305m, 400m and 500m. Erosion surfaces, existing literatures and field verification suggests about glaciations in Permo-Carboniferous period. Very little evidences are preserved in upper part of Sukna fault valley in the form of Talchir boulder beds, Giridih Gondwana sedimentary basin. Barakar itself is a major source of irrigation rather due to construction of major dam e.g. Tilaya and Maithon. It's flow water volume is very low in catchment



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3237 - Geomorphological Dynamics And Adaptive Management Of The Pilcomayo River Multiscale Methodology For Monitoring Rivers In Field

Javier Nunez Villalba¹, Barbara Belletti², Hervé Piégay³, Denise Caceres⁴, Stéphane Debard⁴

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The Pilcomayo river is a transboundary and highly dynamic river, located in a large and flat floodplain, where multiple stakes - linked to water resource, flooding and biodiversity protection - coexist. This paper describes the multiscale methodological approach designed to quantify the geomorphological behaviour of the Pilcomayo River between Villamontes and Misión La Paz. Due to the hydraulic and hydroclimatic conditions, the Pilcomayo is actively shifting and undergoes a rapid vegetation growth. To explore such biogeomorphic behavior over the last 4 decades, a methodological integration is proposed that combines the massive processing of satellite data with high-resolution field validations. At a regional scale, the methodology employs the Google Earth Engine platform to process time series of Landsat imagery (1990–present). The processing includes the creation of cloud-free spatiotemporal data cubes to delineate the annual active channel and vegetated areas. The aim is to delineate a migration envelope capturing the maximum historical extent of the active channel, and to track riverscape changes after each flooding event. For that purpose, spectral indices are calculated to classify land cover, identifying water, bare soil, and vegetation succession stages. For local validation, drone images (RGB and multispectral) processed using photogrammetry are used. This field data acts as ground truth to calibrate the geometric accuracy of satellite delineations and develop models that relate spectral indices to biophysical vegetation parameters. To analyse in detail the data cube, the river corridor is segmented into Disaggregated Geographic Objects (DGOs), which allows for statistical analyses. The final goal is to produce monitoring tools, including indicators and platforms for data processing, analysis and visualisation, to support the adaptive management of such a dynamic river. The combination of tools and scales overcomes the limitations of standard remote sensing in highly shifting rivers, resulting in a robust monitoring protocol applicable to such river systems globally.



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C24.20-Global Change and Human Mobility => Human Mobility and Local Development: Interdependencies and Perspectives



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1135 - From Depopulation To (partial) Revitalization Mobility Migration And Local Development In An Iberian Left Behind Border Region

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The presentation examines how mobility and migration shape local development in the Zamora/Trás-os-Montes border region, a rural area spanning western Spain and northeastern Portugal. Long marked by depopulation, ageing, and socio-economic marginalization, the area has recently become both a transit corridor and a destination for immigration flows. However, arrivals have not outweighed out-migration, so the region retains a negative migration balance and continued population decline.

Drawing on qualitative interviews and participant observation in Sayago (Zamora) and three Trás-os-Montes municipalities, complemented by census indicators, the presentation analyses how these movements are reconfiguring local economies, labour markets, and community dynamics. It shows that internal and international migrants can revive semi-abandoned villages, fill labour gaps, create small businesses, and sustain rural services through consumption and small business creation.

The study focuses especially on “lifestyle migrants” who relocate in search of a better quality of life and may work remotely or in sectors such as crafts, hospitality, and agritourism. It also points to ongoing cross-border movement among long-term residents. Migration inflows and everyday commuting are shaped by family connections and cultural affinity. Together, these patterns depict a functional borderland where residents negotiate wage gaps, disparities in retail infrastructure/services, and diverse administrative systems while sustaining reciprocity networks and mutual support.

Mobility and migration therefore appear not only as demographic or economic trends, but also as drivers of place-based renewal and cultural hybridity that reshape belonging and “local” identity. At the same time, limited institutional support, precarious employment and housing, and linguistic or administrative barriers can hinder settlement and integration, particularly for non-EU migrants.

The presentation concludes by advocating territorially sensitive, cross-border governance that links migration reception to rural development strategies, reduces administrative friction, and strengthens language support, housing access, and pathways to stable work for newcomers.



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1173 - Social Innovation And Human Mobility In Left Behind Areas. Strategies To Cope With Peripherality In Italy

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This paper investigates the reciprocal relationship between social innovation and human mobility in left-behind inner areas, addressing a gap in scholarship that has largely examined these phenomena separately. Focusing on two Italian case studies—Southern Cilento (Campania) and the Viù Valley (Piedmont)—the study advances the hypothesis that mobility is not only a response to territorial decline but also a constitutive driver of socially innovative practices, while social innovation itself reshapes patterns of mobility. The analysis draws on qualitative fieldwork comprising 100 in-depth interviews with local stakeholders, return migrants, newcomers, out-migrants, seasonal inhabitants, and long-term residents, enabling a multi-perspective understanding of mobility trajectories and innovation processes. Findings show that mobile actors introduce new skills, networks, and imaginaries that stimulate collective learning, organizational experimentation, and the creation of cultural initiatives, tourism infrastructures, and community services. These socially innovative practices, in turn, generate new forms of temporary, circular, and sometimes permanent mobility, producing recursive feedback loops that strengthen local capacities and reinsert peripheral territories into wider relational networks. However, the two cases reveal divergent outcomes linked to institutional conditions. In the Viù Valley, structured multi-level governance and targeted repopulation programs support the consolidation and scaling of initiatives, whereas in Southern Cilento innovation relies more heavily on associative networks and returnee-led projects, resulting in vibrant but fragile trajectories. The paper concludes that left-behindness is a relational and dynamic condition shaped by the circulation of people, ideas, and practices, and that the co-evolution of mobility and social innovation offers both opportunities for territorial renewal and challenges related to institutional inequality and sustainability.



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2463 - Building Identity On A Blank Slate The “non Native” Consensus In Shenzhen

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This study examines the “Non-Native” Consensus in Shenzhen, a unique social contract emerging from the city’s distinctive demographic composition where the majority of residents are migrants. Drawing on qualitative interview data, I identify how the shared experience of being “outsiders” has fostered an urban culture characterised by inclusivity, tolerance, and meritocracy. Unlike traditional Chinese cities where local identity plays a dominant role, Shenzhen’s lack of a deeply rooted native population has created what participants describe as a “blank slate” social fabric.

The findings reveal three key dimensions of this consensus. First, inclusivity through shared outsider status reduces regional discrimination and creates mutual empathy among residents who understand the challenges of settling in a new city. Second, professionalism over connections establishes a transparent, rule-based system where advancement depends on merit rather than family networks or guanxi. Third, identity formation against original residents shows how migrants define themselves as “Strivers” or “New Shenzheners”, earning belonging through professional success rather than birthright.

The consensus manifests in participants’ preference for Shenzhen’s “comfortable distance” in social interactions, transparent bureaucratic processes, and freedom from traditional social pressures. By defining themselves in opposition to both their hometowns and the city’s small population of landed villagers, non-native residents have constructed an identity based on contribution to the city’s future rather than connection to its past. This “platform city” model offers insights into how rapid urbanisation and migration can generate novel forms of urban citizenship and social cohesion in contemporary China.



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C24.20-Global Change and Human Mobility => Human Mobility in Geographical Crossroads: Narratives, Governance, and Migrant Agency



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1273 - The Impact Of The Covid 19 Pandemic On Mobility And Migration Patterns In Spanish Left Behind Areas

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This paper analyses how the COVID-19 pandemic reshaped mobility and migration patterns in two left-behind Spanish territories —Sayago county and El Hierro island— and evaluates whether these changes resulted in enduring structural transformations or merely temporary spatial reconfigurations. The study is conducted within the framework of the REPLACE project and adopts a qualitative research design. Empirical evidence is drawn from in-depth interviews with a total of 12 experts, 30 migrants (including internal and international in- and out-migrants), and 10 stayers in each case-study area. The interview sample was balanced in terms of sex, age, educational level, and professional profiles. All the interviews were audio-recorded, transcribed verbatim, and systematically coded. Data were analysed using qualitative content analysis, focusing on the perceived impacts of the COVID-19 pandemic, which enabled the identification, categorisation, and interpretation of key thematic dimensions.

The COVID-19 crisis produced an unprecedented disruption to human mobility, with highly differentiated territorial effects conditioned by demographic and socio-economic structures, and the availability of universal health systems. In predominantly rural, low-density, and ageing regions of the European Union, pandemic restrictions altered everyday movement in specific ways: reductions in daily mobility were generally less pronounced than in large metropolitan areas due to lower reliance on public transport and the continued operation of essential activities linked to the primary sector. Simultaneously, the pandemic triggered a temporary increase in residential mobility towards rural and low-density areas, driven by the expansion of teleworking, perceptions of greater health safety, and a renewed valuation of rural quality of life.

However, the research suggests that these pandemic-era movements rarely resulted in lasting transformation, evidence from the two case-study areas indicates that the effects of COVID-19 on rural mobility are better interpreted as temporary spatial reconfiguration rather than a structural transformation. These dynamics were shaped by pre-existing territorial conditions, levels of accessibility, digital connectivity, availability of basic services, and local institutional capacity. Moreover, the interview data reveal that the pandemic occupies a limited place in respondents' mobility narratives; when referenced, it is largely articulated through individual experiences and personal circumstances, rather than as an enduring factor in mobility and migration choices.



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1280 - Sub Ethnicity And The Localization Of Overseas Chinese Communities A Case Study Of Yokohama Chinatown

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The concept of sub-ethnicity refers to divisions within an ethnic group based on factors such as place of origin, dialect, education, and ideology. While some of these distinctions are rooted in innate attributes—such as the divide between Cantonese- and Fujianese-origin Chinese overseas—this study focuses on ideological factors that emerged after 1949. Following the establishment of the People’s Republic of China, overseas Chinese communities were split into two sub-ethnic factions: the Mainland faction, supporting the Chinese Communist Party, and the Taiwan faction, supporting the Kuomintang. Their confrontation continued until the 1970s but gradually diminished due to shifts in global geopolitics, including the PRC’s accession to the United Nations and the end of the Cold War.

This ideological rivalry also led overseas Chinese communities to reflect on their political orientations and stimulated a process of localization. Since the 1970s, overseas Chinese have increasingly prioritized integration into local societies and the establishment of socioeconomic and political status, rather than maintaining strong political ties with Mainland China or Taiwan.

Based on semi-structured interviews and documentary research, this study examines Yokohama Chinatown as a case of this transformation. While the Yokohama Chinese community experienced a similar trajectory from division to reconciliation as seen elsewhere, its distinctive feature lies in the 1990 reconstruction of the Yokohama Kuan-Ti Temple, which provided a platform for the two factions to move beyond ideological boundaries and engage in cooperation in community governance, including education and commerce. In this process, the meaning of “Chinese” has shifted from a politicized national identity toward a shared cultural identity and place identity to Yokohama Chinatown.

This study aims to explore a series of changes in Yokohama Chinatown since the 1970s and reveal, from a geographical perspective and at the local scale, the localization process of overseas Chinese communities and the transformation of their identity within this process.



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1432 - The Formation Of Residential Clusters Of Foreigners And Its Relationship With Real Estate Acquisition In The Tokyo Metropolitan Area

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Background

In recent years, Japan's foreign population has grown, reaching a record high of nearly four million by the end of June 2025. At the town block level, areas with foreign population ratios exceeding several tens of percent have emerged. However, not enough is known about the formation process of residential clusters of foreigners and its relationship with real-estate acquisition.

Materials and Methods

This study focuses on the Nishikawaguchi 1-chome area in Kawaguchi City, Saitama Prefecture, which borders the Tokyo Metropolis and has the largest foreign population among all Japanese municipalities, with a foreign population ratio exceeding 30%. The author used the Ministry of Justice's "Real Property Registration," which publicly records actual property conditions and the rights involved, to determine how many foreigners acquired real estate and began residing in a given location, as well as when this occurred.

Results

Chinese residents or companies began acquiring real estate in the early 2000s, which coincided with a crackdown on illegal brothels. Subsequently, the number of Chinese owners surged in the 2010s. A key background factor is the aging of Japanese owners, whose properties were initially inherited by relatives but subsequently sold. Notably, once Chinese residents or companies acquired property, ownership was often transferred to other Chinese owners.

Conclusion

Some have attributed the formation process of residential clusters of foreigners not only to changes in Japanese government residency management policies but also to Japanese population dynamics. It has also been speculated that the sharing of real-estate information within foreign communities has further accelerated foreign ownership.



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C24.20-Global Change and Human Mobility => International Student Mobility as a Life Course Strategy



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1357 - International Student Mobility As A Life Course Strategy Studies In Japan

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In the series of study, we confront the reality that the presence and mobility of international students have induced geographical transformations across multiple scales in both their countries of origin and the destination, namely Japan. By situating the life courses of international students within institutional, economic, and cultural contexts, we conduct a cross-scalar analysis of their trajectories. At the heart of this inquiry lie two central academic questions: (1) Can Japan continue to be a favorable destination for international students—not only as a place of study, but also as a site for living and working? (2) What strategic significance does studying in Japan hold within the life course of international students as agents of mobile lives?

This research comprises three interrelated domains:

- . A micro-level analysis of individual records from the “Survey on the Enrollment Status of International Students” to construct a comprehensive portrait of international students in Japan.
- . An examination of the spatial and social transformations in Beppu City, which is a provincial city located in Kyushu, Japan, resulting from the increasing number of international students, alongside an exploration of their lived experiences within this context.
- . An investigation into the life courses of international students, with the aim of elucidating the strategic meaning of studying in Japan within their broader life trajectories.

The first speaker offers the basic information for the following presentations.



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1532 - Beyond Mobility Long Term Effects On International Students In The Cplp.

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The international mobility of higher education students from the CPLP - Comunidade dos Países de Língua Portuguesa (Community of Portuguese Speaking Countries) to Portugal has been widely studied, particularly with regard to academic experiences and integration during the period of study. However, empirical evidence on the long-term effects of such mobility remains limited. This paper addresses this gap by analysing the long-term outcomes (five to ten years after graduation) of international study trajectories from the Portuguese-speaking African countries (PALOP) and Brazil, focusing on professional trajectories, geographic mobility and the conversion of academic mobility into social and professional capital.

Drawing on a mixed-methods research design, the study combines a retrospective online survey with in-depth semi-structured interviews conducted with former higher education students from Brazil and the PALOP who studied abroad, primarily in Portugal and Brazil. The analysis compares patterns of return, permanence and circulation, as well as differences in labour market integration, recognition of qualifications and access to professional networks.

The findings reveal markedly differentiated long-term trajectories between Brazilian and PALOP graduates, highlighting how similar linguistic and institutional frameworks can produce unequal outcomes. While international mobility often generates cumulative advantages, these benefits are unevenly distributed and strongly mediated by structural factors such as nationality and social background. The paper argues that student mobility in the CPLP operates less as a balanced space of academic circulation and more as an asymmetrical regime of mobility, reproducing existing inequalities within the lusophone world.

By shifting the analytical focus from short-term academic experiences to long-term effects, this study contributes to debates on internationalisation, postcolonial inequalities and mobility regimes, offering new insights for research and policy on higher education cooperation in the CPLP.



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1702 - First Generation Settlers Under Uncertainty Sri Lankan Entrepreneurship And Family Formation In Beppu A Regional City In Japan

Tomohiro Kai¹

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Background/Hypothesis

As Japanese regions face population decline and aging, immigrants are considered a chance to sustain local economies and everyday life. One example is international students staying regionally after graduation for employment or entrepreneurship. However, previous studies have analyzed this international student mobility merely from perspectives of educational investment and human capital. As a result, diversity of post-graduate life-courses, including entrepreneurship and family formation, have not been sufficiently examined. Thus, this study proposes the following hypothesis: Sri Lankans, who choose to start post-graduate entrepreneurship and settle in regional cities, are exactly those “first-generation” migrants that Japanese society longs for. However, Sri Lankan migrants are in early-stage of migration, where institutional knowledge and networks are limited. Consequently, prospects for stable life-course and family formation become highly uncertain.

Materials and Methods

This study focuses on Sri Lankans, whose migration to Japan is relatively recent and whose life-course strategies are not yet established within their ethnic community. Research site is Beppu City, a university city of 113,000 inhabitants, where number of Sri Lankan students has significantly increased. Qualitative interviews were conducted with Sri Lankan entrepreneurs and families, who started small businesses after graduation. Interviews focused on work experience, business start-up, residence status issues, family formation and community relationships, analyzing how entrepreneurship is positioned within their life-courses.

Results

Entrepreneurship was often primarily chosen to secure residence status and income. However, business establishment depended heavily on spousal support, limited networks, and insufficient institutional understanding. This led to continuous uncertainty, which sometimes negatively impacted life-courses and family formation, for example, in business strategies and decisions regarding childcare and education.

Conclusions

Although post-graduate entrepreneurship is often described as “success,” it is built on a fragile foundation borne by families and unstable networks. This study emphasizes importance of analyzing life-courses under viewpoint of uncertainty in early-stage migration communities.



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1716 - Reconceptualising Urban Structure As A Bundle Of Services For International Students In Japan's Non Metropolitan Cities The Case Of Beppu

Kentaro Kuwatsuka¹

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In Japan, the concentration of functions in the Tokyo metropolitan area extends beyond population. It includes economic activities and social infrastructure, placing regional cities at a structural disadvantage. Universities in these non-metropolitan areas, primarily organized around undergraduate programs, have become strategic institutions expected to mitigate youth outflows and attract inflows of both domestic and international students. However, this perspective often overlooks the significant livability that regional cities can offer to students.

To address this, the paper reconceptualizes urban structure as a bundle of services rather than a static aggregation of functions. According to Christaller's central place theory, regional cities provide a narrower and less diverse range of functions, such as retail, leisure, healthcare, and public services. Compared to metropolitan areas, this limited scope restricts choice and accessibility. The mere existence of functions does not ensure usability; however, they become valuable when actively utilized through individual capacities and social interactions. By adopting this relational perspective, functions can be seen as resources whose uses are derived by actors. It follows that livability is enhanced not by the isolated use of resources but by mobilizing their complementary and synergistic interrelations.

Empirically, this paper examines Beppu City in Ōita Prefecture, which has a population of approximately 110,000. International student numbers have risen since the early 2000s. Using building-use data, it maps urban structure with a focus on student rental apartments and interprets the resulting spatial patterns relationally. Findings show that Beppu's tourism-oriented configuration shapes student livability not only by providing diverse consumption opportunities but also by offering opportunities for part-time work in tourism-related industries. This dual role expands students' range of choices. These findings underscore the importance of viewing urban structure as a dynamic bundle of heterogeneous potential services rather than a static aggregation of facilities.



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1743 - Life Courses And Transnational Migration Strategies Of Korean International Students In Beppu Japan

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This study examines the decision-making processes regarding study abroad and career formation among current and former Korean students who have studied at Ritsumeikan Asia Pacific University (APU) in Beppu, Japan. By analyzing these processes, the research aims to clarify their study-abroad strategies and the meanings of migration.

Based on in-depth interviews, two insights can be derived. First, respondents' decisions to study at APU can be understood as transnational migration shaped by the interplay of multi-scalar factors. These include the pursuit of internationally recognized values under globalization; South Korea's intensification of social competition; Japan's internationalization policies through attracting highly skilled human resources; and strategies of local cities to retain young populations.

Second, for Korean students at APU, the meanings of internationalization have changed over time. For students who enrolled during the university's early years, studying abroad functioned to enhance career value by acquiring educational credentials and skills—such as degrees from a so-called “developed country” and English-medium education—that are valorized by hegemonic global powers. During this period, APU served as the site for acquiring internationally recognized credentials. In contrast, for younger generations who have grown up in an era of international migration from an early age, internationality is no longer something to be deliberately pursued or challenged for, but rather something naturally encountered throughout their lives. Such experiences also include negative aspects, such as social discrimination and loneliness. Consequently, these students increasingly prioritize not only career advancement and upward social mobility, but also the availability of multicultural environments where they can feel safe, secure, and emotionally at ease, and to which they can develop a sense of belonging. For such students, APU and Beppu function as a “multicultural bubble”, offering a well-developed environment of multicultural coexistence in which safe and equitable conditions for learning and everyday life are ensured for international students.



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1844 - Diversity Of International Students In Japan By Nationality Analysis Of Lifestyle Survey Of Privately Financed International Students

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The purpose of this study is to analyze international students in Japan by nationality and to portray their respective characteristics.

According to JASSO, there were around 330,000 international students in Japan, 2024. Japan's international student admission policy has consistently adopted an expansionary approach, albeit with evolving objectives. The recent increase in international students is characterized by a higher proportion of self-funded students, greater nationality diversity, and more students seeking part-time work. In other words, the growth in international student numbers has been accompanied by a diversification of their characteristics. However, this diversity is often overlooked when discussing challenges and expectations in policy and research. In this study focuses on the multi-polarization of nationalities among the diversifying attributes of international students. It clarifies the characteristics of international students by nationality and explores the diversity of what international students from each country seek from studying in Japan, that is, the meaning of studying in Japan.

The analysis used individual data from the 2019 Survey on Living Conditions of Privately Financed International Students (7,025 respondents, response rate 70.3%). The analysis covered 11 countries and regions with a large number of international students and over 100 respondents to this survey: China, Vietnam, South Korea, Nepal, Taiwan, Indonesia, Myanmar, Sri Lanka, Malaysia, Mongolia, and Thailand. The students' experiences were divided into three stages: pre-departure expectations; living conditions during studies abroad, including housing and part-time work; and plans after studies, such as employment or returning home. These findings revealed trends at each stage and showed that the purpose of studying abroad is reflected in differences in type of school attended and how students spend their time abroad. Additionally, career prospects after graduation are influenced not only by economic factors, but also by cultural beliefs in each country.



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C24.20-Global Change and Human Mobility => Migrations and Their Challenges in an Interconnected World: Concepts, Methodologies, and Social Actors



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1734 - Territories Of Displacement Armed Conflict And Local Resistance At The Colombia–Venezuela Border

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Forced displacement in Colombia profoundly reshapes local communities and the territorial dynamics of border regions. After Syria, Colombia has the largest population of internally displaced persons worldwide, with particularly severe impacts in border areas such as Norte de Santander, adjacent to Venezuela. Unlike in many other contexts, displacement in Colombia is largely driven by violence perpetrated by non-state armed actors—guerrilla and paramilitary groups competing for territorial control sustained by the cocaine economy.

Many displaced rural populations migrated to Venezuela during the oil boom in search of safety and employment, yet their trajectories were further shaped by intersecting forms of state violence. In 2015, the Venezuelan government forcibly expelled over 25,000 Colombian migrants, baselessly accusing them of threatening national security, and subsequently closed the border, disrupting cross-border trade. Today, displaced populations remain stranded in the borderlands, facing persistent armed violence, economic precarity, and the abandonment of the Colombian state.

This paper has two aims. First, it examines forced displacement at the Colombia–Venezuela border through a feminist geopolitical lens, which foregrounds how local actors exercise agency in everyday spaces to renegotiate power, territory, and security beyond state-centric analyses. I argue that this approach is particularly apt for understanding how structural violence intersects with informal, everyday forms of resistance. Second, the paper explores the spatial strategies developed by displaced populations to contest state-imposed immobility and abandonment. The analysis draws on a two-year participatory research project conducted with borderland inhabitants, culminating in the documentary *Weaving Threads Across Borders*.



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1814 - More Than Figures The Economic And Sociocultural Impact Of Venezuelan Migration In Bogotá (2020 2025)

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Since 2017, Bogotá has established itself as the primary global hub for Venezuelan migration, with a projected population of 600,000 people by 2025. This flow occurs as the capital undergoes an accelerated demographic transition and faces productivity challenges. The migrant population acts as a multidimensional catalyst (Massey et al., 1987; Rodicio-García, 2019; IOM, 2019). Beyond providing a young workforce that mitigates local aging, their integration generates a “migratory dividend” by strengthening Transnational Social Capital: a set of networks, tacit knowledge, and cultural expressions that revitalize the urban and business fabric, despite existing barriers of exclusion. A mixed-methods design is employed. The quantitative component systematizes microdata from the Integrated Household Survey (GEIH) conducted by the National Administrative Department of Statistics (DANE) and records from the Bogotá Chamber of Commerce. The qualitative component utilizes perception surveys and interviews conducted with both migrant and non-migrant populations to triangulate productivity indicators with cultural hybridization processes. The data reflect a migrant labor participation rate of 80.7%, compared to 71.3% for the local population. Between 2019 and 2022, companies with foreign participation generated 10.8% of formal employment in strategic sectors. Socioculturally, surveys show a transformation of the urban landscape and a transfer of knowledge that drives innovation in services. However, 64.5% of migrants remain in the informal sector, facing a wage gap of 39.7% due to labor sub-categorization. Migration represents a net gain in vitality for Bogotá. The transition from “figure” to “social asset” requires governance that prioritizes formalization. The cost of cultural and economic invisibility significantly outweighs the investment required for effective inclusion.



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1815 - Advances In The Conceptualization Of Migration Territories An Analysis Through Participant Observation In Bogotá (2020-2025)

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The conceptualization of migration territories has frequently been reduced to static or transit categories. However, the scale and permanence of the Venezuelan flow in Bogotá demand a critical revision that transcends the view of territory as a mere container of flows. This research posits that migration territories in Bogotá are not just settlement areas, but spaces in constant renegotiation that reveal new contents emerging from the tension between urban institutionality and daily practices of belonging, shaping hybrid and transnational territorialities. The study is developed in two phases. First, an epistemological analysis of existing concepts regarding migration territories and their various definitions to identify theoretical gaps. Second, fieldwork based on participant observation in strategic sectors of Bogotá during the 2020-2025 period, capturing vernacular forms of territorial construction from the lived experience of the actors. The analysis reveals that these migration territories integrate dimensions of “permanent provisionality” and mutual aid networks that reconfigure the use of public and private space. Participant observation identifies that territorial construction occurs through micro-practices of symbolic and economic appropriation that challenge conventional definitions of segregation. This research contributes significant advances by proposing a more fluid and relational definition of migration territories. It concludes that understanding these new ways of spatial construction is fundamental for urban planning that recognizes migrants as active subjects in the production of the contemporary city.



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2530 - A Comparative Study Of The Spatial Configuration And Development Of Chinese Migrant Businesses In Osaka's Minami Area And Jeju Island

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1. Background

With the advancement of globalization and information and communication technologies, an increasing number of Chinese migrants have established businesses in host societies by using mobile applications. However, even within the same ethnic group, business forms and spatial configurations vary depending on destination contexts. This study examines how Chinese migrants construct different commercial networks and spatial arrangements under varying settlement conditions and mobility regimes.

2. Methods

This research adopts a comparative case study approach focusing on the Osaka's Minami area, Japan, and Jeju Island, South Korea. In the Osaka's Minami area case, field surveys were conducted to identify the spatial distribution and industrial composition of Chinese migrant businesses, supplemented by questionnaire surveys targeting business owners and employees. Based on these materials, the study analyzes target customer characteristics, patterns of mobile application usage, and settlement trajectories. In contrast, the Jeju Island case relies on preliminary research using existing literature, administrative documents, and online sources to examine trends in Chinese migrant businesses within the tourism sector, alongside the preparation and design of ongoing fieldwork.

3. Case Studies

Osaka's Minami area has developed as a major urban commercial district, characterized by a high-density and diversified agglomeration of Chinese migrant businesses. By contrast, Jeju Island is positioned as a popular tourist destination, where Chinese migrant businesses are closely linked to tourism services and short-term mobility. These contrasting contexts—an urban, settlement-oriented agglomeration and a tourism-based, high-mobility business environment—provide an appropriate framework for comparative analysis.

4. Results and Conclusions

The Osaka's Minami area case reveals that more than 300 Chinese migrant businesses form a stable commercial cluster embedded in the long-term urban structure, targeting resident Chinese migrants while also accessing tourists through mobile applications. Preliminary findings from Jeju Island suggest the presence of a tourism-oriented business structure characterized by high mobility and transnational networks. This comparative analysis concludes that differences in residential stability, dependence on tourism, and institutional contexts generate diverse spatial configurations and development patterns of Chinese migrant businesses.



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2729 - Forced Migration And Territorial Crisis In The Catatumbo Region Colombia Recent Dynamics And Governance Challenges

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The Catatumbo region, located in northeastern Colombia along the Venezuelan border, has historically been shaped by armed conflict, illegal economies, and weak state presence. In recent years, this territory has become a critical node of human mobility, characterized by both internal displacement and cross-border migration, intensified by the Venezuelan socio-economic crisis and the persistence of armed violence.

This paper analyzes contemporary migration dynamics in Catatumbo in relation to the humanitarian and territorial crisis affecting the region. From a human geography and territorial planning perspective, three dimensions are examined: spatial patterns of forced mobility and settlement, the interaction between armed actors, illicit economies, and territorial control as drivers of displacement, and the socio-spatial impacts on rural communities, intermediate urban centers, and border corridors.

Methodologically, the study draws on official data (UNHCR, OCHA, DANE, and Colombia's Victims' Unit), cartographic analysis, and the systematization of recent humanitarian reports, complemented by academic literature on forced migration and border studies. The findings show that Catatumbo operates as a territory of transit, confinement, and re-expulsion, where migration processes are intertwined with dispossession, labor precarization, and the fragmentation of social ties.

The paper concludes that the migration crisis in Catatumbo cannot be understood solely as a demographic phenomenon, but rather as an expression of a structural territorial crisis. It argues that institutional responses must articulate migration policy, humanitarian assistance, and territorial development strategies with a differential and cross-border approach, recognizing the border as a lived space rather than merely an administrative boundary.



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C24.20-Global Change and Human Mobility => Navigating Globility: Human Mobility, Immobility, and Community Wellbeing



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1404 - Mobility Patterns And Demographic Trends In Zadar County Croatia

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Demographic trends in Croatia in the 21st century have been particularly unfavorable, resulting in pronounced depopulation driven primarily by emigration and, to a lesser extent, by natural population decline. These processes, however, exhibit considerable regional variation, both between and within counties. Zadar County, located along the Adriatic coast, encompasses three distinct geographical regions – the islands, the coastal area, and the hinterland – each characterized by specific demographic trends and mobility patterns. These differences, rooted in the 20th century, have persisted into the 21st century.

Several key turning points have shaped demographic change and population mobility in the county, including industrialization during the 1960s and 1970s, the Homeland War in the early 1990s, the expansion of the tourism sector, and Croatia's accession to the European Union. This study examines dominant demographic trends and mobility patterns in Zadar County in the 21st century, with particular emphasis on their socio-economic consequences.

Depopulation and population ageing have been especially pronounced on the islands and the hinterland, while coastal settlements have experienced relatively more favorable trends. A notable paradox is the simultaneous increase in the number of dwellings despite the population decline. This phenomenon can be largely attributed to tourism development and EU accession, which enabled foreign EU citizens to purchase real estate in Croatia. As a result, the number of permanently occupied dwellings (particularly on the islands) has decreased, while the number of occasionally occupied dwellings and second homes has increased substantially. The observed demographic and mobility patterns have generated distinct regional needs, highlighting the importance of social resilience, economic adaptation, and the maintenance of community wellbeing.



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1578 - Three Refugee Waves In Lithuania Through The Lens Of The Chicago School

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Lithuania has long been a country of emigration, but in recent years, it has become a country of immigration. A significant part of it consists of refugees. Lithuania has experienced three distinct waves of refugees, each eliciting varying responses from the public and government.

The first wave of refugees from the Syrian conflict occurred between 2015 and 2017 as part of an EU resettlement initiative. However, only 19 out of the 1,105 pledged asylum seekers were resettled, largely due to negative public sentiment and diminished social benefits. The second wave in 2021 caused a significant influx of migrants from the Middle East and Africa at the Belarus-Lithuania border. This situation led to widespread opposition and heightened perceptions of a national security threat, while human rights concerns were largely overlooked. In sharp contrast, the third wave of Ukrainian refugees fleeing the Russian invasion received substantial support from both officials and the public, highlighting a “double standard” in attitudes toward refugees. By late 2024, Lithuania had registered over 92,000 Ukrainian refugees, providing them with temporary protection and support for integration.

Lithuania’s migration policy faces two potential pathways for the future of refugees within the country: providing suitable accommodation for those planning to return to their countries of origin or implementing effective integration measures for those who choose to stay. In this context, the classical ideas of the Chicago School can serve as a valuable methodological tool for addressing this issue. The core concept of immigration as a process marked by stages of contact, conflict, accommodation, and assimilation provides a promising framework for analysis. Contemporary interpretations prioritise integration over assimilation, recognising the importance of distinct cultural identities within a cohesive society.



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1805 - Mapping Population Mobility And Immobility In Latvia's Peripheral Areas

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Background

This study aims to map and analyse patterns of population mobility and immobility within Latvia's peripheral areas. It focuses on how migration trajectories are shaped by spatial context, connectivity, and local socio-economic conditions. The research is situated within Latvia's broader demographic landscape, which is characterised by long-term population decline, an ageing society, and selective mobility.

Materials and methods

The study utilises two contrasting case studies: Roja parish in Western Latvia (Kurzeme) and Rogovka village in Nautreni parish in Eastern Latvia (Latgale). These locations were selected to reflect national demographic trends in distinct ways. Primary data were gathered through interviews with 10 immobile and 30 mobile households in each case study area. Respondents were selected using the snowball sampling method, ensuring a balance across age groups and gender. These interviews allowed for the subsequent mapping and analysis of specific mobility trajectories.

Results

The findings highlight distinct mobility profiles based on regional economic health. Rogovka/Nautreni parish in the Latgale region exemplifies deep peripheralisation, characterised by long distances to labour markets and limited employment opportunities. This area shows low overall mobility, persistent net population losses, and one-way migration moves, with widespread immobility among older adults. Conversely, Roja parish - a coastal area with better connectivity to Talsi and Riga - supports a more varied set of trajectories. Its diversified economic base, including tourism and industry, facilitates commuting, seasonal mobility, and temporary moves alongside selective immobility.

Conclusions

The research concludes that mobility patterns in Latvia's periphery are highly dependent on geographic location and economic diversification. While both areas face demographic decline and ageing, coastal and semi-peripheral zones like Roja maintain higher levels of circulation and connectivity. In contrast, more isolated rural areas in Latgale face a cycle of depopulation where international migration remains limited because the areas are already heavily depopulated, leaving behind an immobile, ageing population.



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1936 - Geographies Of International Student Mobility Latvia As A Strategic Alternative In The Global Tertiary Education System

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Background

The growth in international student mobility (ISM) highlights the increasing internationalisation of higher education and the growing interest in alternative destinations outside traditional host countries. New ISM centres, such as those in Latvia, challenge the dominance of traditional host countries, promoting a more multipolar global education landscape. This article aims to identify the strategies of students who are oriented towards the global tertiary education space and end up in Latvia.

Materials and methods

The study uses a mixed-methods research design, combining a survey of international students studying in Latvia for a degree or qualification (n = 1,809), conducted in November–December 2024, with semi-structured interviews carried out between May and November 2025. The survey captures students' motivations, residential choices, and plans, while the interviews provide in-depth insights into their study and living experiences in Latvia.

Results

Latvia has become a leading international student destination in the Baltic states, with approximately 11,600 international students enrolling in higher education in the 2024/2025 academic year, accounting for approximately 14% of the total student population. Latvia attracts a diverse student body, with a particularly rapid increase in students from South and Central Asia. Interview results show that for most students, Latvia was not their first choice of study destination, but rather an alternative determined by accessibility, admission requirements, and visa considerations.

Conclusions

Latvia is an example of how the new ISM destination operates in a multipolar educational geography, attracting students through strategic positioning rather than prestige. The results show how non-traditional centres use their relative advantages- accessibility, location, and access- to create niches in global student mobility flows.



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1960 - Residential Aspirations And Integration Among Foreign Residents In Japan Spatial Differentiation Between Metropolitan And Regional Areas

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Since the 1980s, Japan has expanded the acceptance of foreign residents to address labor shortages, resulting in a foreign resident population of nearly four million by 2025. Despite this growth, foreign residents remain disproportionately concentrated in major metropolitan regions, particularly Tokyo. At the same time, Japan faces rapid population ageing and persistent depopulation in regional areas, prompting policy efforts to encourage migration to and settlement in non-metropolitan regions.

While existing studies have examined the spatial distribution of foreign residents and its determinants, less attention has been paid to foreign residents' residential aspirations, such as whether they wish to continue living in their current place of residence. Residential intentions capture the extent to which individuals' aspirations to remain in place—or to relocate elsewhere—are supported or constrained by their ability to realize desired residential outcomes within specific spatial contexts, rather than migration behavior alone.

Based on an online questionnaire survey conducted in November 2025 among foreign residents living in Japan (n = 749), this study first examines intentions to continue living in the current municipality. The results show that approximately 81 per cent of respondents express a desire to remain in their current municipality, with no significant difference between metropolitan and regional areas at the descriptive level.

The study then analyses how residential continuity intentions are associated with individual integration and whether this relationship varies across spatial contexts. The findings indicate that higher levels of integration are associated with stronger intentions to continue residing in the current municipality. While perceived livability of the area accounts for part of this association, integration retains an independent relationship with residential aspirations. Furthermore, the strength and form of this relationship differ between metropolitan and regional contexts, revealing spatially uneven conditions under which integration shapes residential outcomes.



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2015 - “uneven Geographies Of Development A Multi Dimensional Analysis Of The Demographic And Socio Economic Determinants Of ‘left Behind Places’ In Latvia”

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Background/Hypothesis

Uneven socio-spatial development and polarisation are multidimensional and multi scalar processes that have become defining features of contemporary Europe. Persistent regional differences in demographic and socioeconomic development increasingly challenge social and territorial cohesion. Within this context, the concept of left-behind places has emerged as a key framework for understanding territories affected by cumulative disadvantage. This research examines left-behind places in Latvia, focusing on demographic dynamics in peripheral, rural, and former industrial areas. Building on Billari’s “fast and slow” demography framework, the study hypothesises that demographic disadvantage in Latvia’s left-behind places results from the interaction between long-term structural processes, such as population ageing and low fertility, and faster disruptive changes, including out-migration and sudden population losses.

Materials and Methods

The study draws on quantitative and spatial analysis of data at the parish and town level from the Central Statistical Bureau of Latvia. Demographic indicators include population change, migration patterns, and age structure, complemented by selected socio-economic variables. Multivariate methods, including principal component analysis and territorial clustering, are applied to identify spatial patterns of demographic disadvantage. Particular attention is paid to differences between the Riga metropolitan area, peripheral regions, and former industrial mono-towns. The research is ongoing, and this abstract presents the analytical framework and preliminary findings.

Results

Preliminary results suggest that Latvia’s left-behind places are characterised by combined fast and slow demographic change. Peripheral and former industrial territories often experience abrupt population losses alongside long-term structural decline and ageing. These patterns contribute to increasing demographic polarisation between core and peripheral regions.

Conclusions

The findings highlight the importance of temporal heterogeneity in understanding demographic change in post-socialist contexts. By integrating demographic temporalities into the analysis of left-behind places, the research contributes to broader European debates on peripheralisation and socio-spatial inequality and underlines the need for differentiated regional policy responses.



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2054 - The Shifting Geography Of Internal Migration A Geospatial Analysis Of Regional Disparities In Latvia

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Background/Hypothesis

Internal migration constitutes a primary demographic process reshaping contemporary population distributions within countries, particularly in post-socialist contexts experiencing rapid transformation. Despite the inherent spatial nature of migration, spatial autocorrelation methods remain underutilised in migration research. This study investigates spatial patterns of internal migration in Latvia using spatial autocorrelation analysis across three census periods (2000, 2011, 2021). Latvia presents an exemplary case study, having experienced dramatic demographic transformation since 1991, with a projected 30 percent population decrease by 2025. We hypothesise that migration patterns exhibit increasing spatial concentration, reflecting intensifying metropolitan dominance and peripheral marginalisation characteristic of post-socialist transitions.

Materials and Methods

The analysis employs anonymised, georeferenced census microdata on individual migrations between municipalities. Migration patterns are examined using a standardised hexagonal grid system (16.2-hectare cells) to circumvent the Modifiable Areal Unit Problem. Global Moran's I statistics quantify overall spatial autocorrelation, whilst Getis-Ord Gi* statistics identify local hotspots and coldspots of in-migration. Analyses are conducted at both national and metropolitan scales to reveal multi-scalar processes. Statistical significance is assessed through z-scores and p-values ($p < 0.05$).

Results

The analysis reveals exceptional intensification of spatial autocorrelation, with Global Moran's I increasing from 0.284 (2000) to 0.889 (2021), representing a tripling of clustering. The Riga Metropolitan Region emerged as the dominant migration hotspot, with its share increasing from 30.9% (2000) to 62.9% (2021). Concurrent suburbanisation processes increased suburban share from 11.5% to 26.7%. Peripheral regions, particularly Latgale, consolidated as persistent coldspots. Scale-dependent analysis demonstrated that whilst national-level clustering intensified dramatically, metropolitan-level clustering peaked in 2011 (0.611) before declining to 0.580 (2021), indicating spatial diffusion within the metropolitan region alongside intensifying national concentration.

Conclusions

This research provides the first comprehensive spatial autocorrelation analysis of internal migration in Latvia, establishing methodological frameworks applicable to similar demographic transitions. Findings demonstrate that spatial concentration can intensify rapidly under post-socialist transformation, with scale-dependent patterns operating simultaneously. The persistent geographic polarisation between metropolitan and peripheral regions indicates structural spatial disadvantages, necessitating spatially-informed regional development policies acknowledging demographic realities whilst addressing territorial inequalities.



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2159 - Transforming Identities Through Mobility And Immobility Migration Place Attachment And Community Life In Latvia

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Background

This study examines how mobility, immobility, and return migration shape individual perceptions of identity, well-being, and place attachment. It investigates the drivers and consequences of mobility and immobility, and the ways in which international migration experiences influence identity transformations. The research is situated within Latvia's broader demographic context, characterised by long-term population decline, ageing, and selective population movements. Against this backdrop, the study explores how residents negotiate belonging and continuity in communities exposed to uneven demographic pressures and changing mobility regimes.

Materials and Methods

Empirical evidence is drawn from two contrasting rural case studies: Roja parish in Western Latvia (Kurzeme) and Rogovka village in Nautreni parish in Eastern Latvia (Latgale). These localities were selected to reflect differentiated demographic trajectories and regional dynamics. Data consist of semi-structured interviews with 30 mobile and 10 immobile households in each case study area, recruited through snowball sampling to ensure variation across age groups and gender. The qualitative dataset enables comparative analysis of subjective experiences of mobility, identity, and attachment across distinct socio-spatial contexts.

Results

Residents in both case study areas expressed a strong sense of national identity and attachment to place. Immobile residents articulated especially emotional forms of belonging, while international migrants—both emigrants and returnees—reported that migration strengthened their national identity. In Roja, place attachment among non-migrants was associated with housing, property ownership, employment, and emotional and family ties. For in-migrants, family connections and property were key factors, with older generations valuing natural amenities and service quality. In Rogovka, regional identity and participation in cultural activities were emphasised, alongside property ownership and an attractive natural environment.

Conclusions

Place attachment was closely linked to perceptions of well-being, living standards, and quality of life. In Roja, coastal location, higher living standards, and service provision stimulated return and amenity migration. In Rogovka, property, community participation, and intergenerational ties shaped attachment and belonging.



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2175 - Affordable Excellence Strategic Internationalisation And Branding Of Higher Education In The Baltic States

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Background

International Student Mobility (ISM) is increasingly diversifying as “offbeat” destinations emerge as competitive alternatives to traditional Western education hubs. This study examines the Baltic states - Estonia, Latvia, and Lithuania - as regional aspirants in the global higher education (HE) market. It explores how these smaller HE systems navigate demographic decline and underfunding by leveraging “affordable excellence” to attract international talent.

Materials and Methods

The research employs a comparative, multi-method approach. Data includes a comparative analysis of statistical trends from OECD, Eurostat, and national agencies. This is triangulated with semi-structured expert interviews with national promotion agencies (Study in Estonia, Study in Latvia, and Study in Lithuania), a review of strategic educational policy documents, and a multimodal content analysis of official recruitment websites.

Results

Findings reveal a significant upward trend in ISM across the region, with Latvia hosting the highest proportion of international students (15%). While all three countries promote low tuition fees and EU mobility, they employ distinct branding: Estonia positions itself as a digital innovation hub; Latvia emphasises multicultural appeal and affordability; and Lithuania highlights a blend of tradition and modern infrastructure. Despite different policy maturity levels - Estonia having early strategic reforms versus Latvia’s university-led growth - the region successfully collaborates at global events while competing for students through targeted recruitment.

Conclusions

The Baltic states demonstrate how semi-peripheral regions can challenge the dominance of Western destinations by turning “peripherality” into an asset through strategic branding and institutional flexibility. However, structural barriers remain, including language barriers and limited post-graduation labour-market integration. The study concludes that the “affordable excellence” discourse functions both as a successful recruitment tool and a survival tactic for HE systems facing demographic pressures.



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2189 - Visual Methods And The Reframing Of “left Behind” Narratives In Latvia Seasonality Belonging And Everyday Agency

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Background

Rural peripheries across Europe are frequently framed through deficit-based narratives of decline, stagnation, and abandonment, obscuring local agency and everyday practices of belonging. This research proposes that participatory visual methodologies can reframe understandings of “left-behind areas” by foregrounding residents’ lived experiences, seasonal rhythms, and place-based cultural practices.

Materials and Methods

The paper draws on empirical material from the Horizon Europe Re-Place project, focusing on two Latvian rural localities: Roja, a coastal town on the Baltic Sea, and Rogovka, a settlement in the Latgale region. The study employs collaborative visual ethnography and web-documentary filmmaking, with visual materials co-produced with residents and recorded in situ. Data include observational footage, participant narratives, and documentation of everyday infrastructure alongside key seasonal events.

Results

The results demonstrate that participatory visual methods offer a practical way to document everyday life in peripheral places over time through residents’ own experiences and surrounding environments. By capturing both ordinary routines and seasonal moments, the visual material shows how these places are actively lived, revealing that life in so-called “left-behind” areas is often experienced as meaningful and enjoyable rather than defined by decline.

Conclusions

The findings demonstrate that participatory visual methods operate as relational tools that redistribute narrative authority, positioning residents as co-authors rather than passive subjects. By linking structural constraints with cultural creativity and everyday resilience, the study challenges homogenizing imaginaries of rural decline and contributes to geographical debates on peripherality, belonging, and methodological reflexivity.



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2309 - When Staying Matters Youth Decolonial (im)mobility And Alternative Pathways To Wellbeing In Rural Brazil

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Migration across the Americas has been widely analysed through narratives of mobility, aspiration and departure, particularly in regions historically shaped by intense out-migration. However, empirical evidence on immobility as a deliberate, collective and future-oriented choice remains limited, especially in rural contexts of the Global South. This paper addresses this gap by examining how young people living in settlements of Brazil's Landless Workers' Movement (MST) in the Governador Valadares region—often described as the country's “migration capital”—actively reframe staying as a meaningful form of agency.

Drawing on ethnographic fieldwork conducted in MST settlements, the study analyses how youth negotiate mobility and immobility within a regional context where migration to the United States is deeply embedded as a moral and aspirational norm. The research is based on qualitative and participatory methods, including semi-structured interviews, participant observation and informal conversations with young people, community leaders and educators, conducted in close dialogue with the MST's pedagogical practices.

The analysis focuses on how educational projects grounded in Paulo Freire's emancipatory pedagogy, combined with cooperative land management and collective organisation, shape shared aspirations oriented toward permanence, dignity and community wellbeing. While mobility is not rejected, forms of pedagogical circulation—such as participation in Educação do Campo programmes—reinforce territorial attachment rather than rupture, contributing to what the paper conceptualises as desired immobility. Remaining in place emerges not as constraint or stagnation, but as a moral and political project rooted in solidarity, care for the land and collective futures.

The findings challenge dominant migration imaginaries that equate movement with success and progress, showing instead how immobility can operate as a decolonial form of agency that redefines the “good life” beyond departure and individual upward mobility. By shifting the analytical focus from migration as movement to (im)mobility as a relational and collective field, the paper contributes to global debates on human mobility and community wellbeing, highlighting how staying can embody hope, creativity and alternative pathways to social and territorial sustainability under conditions of global change.



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C24.22-Hazards and Risks => Compound Weather-Related Hazards in a Changing World: Geographical Spatio-Temporal Analysis



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1131 - Seventy Five Years Of Temperature And Precipitation Extremes In The Middle East And Its Impacts On Displaced Persons

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Background/hypothesis

Climate-related disasters have increased on a global scale, with temperature extremes becoming more frequent and precipitation patterns more varied. With protracted armed conflicts, large numbers of displaced people, and future predicted increase in climate-related hazards, the Middle East is becoming a hotspot for climate vulnerability. Despite this, the region sees little climate-focused, scientific attention. We investigate the number of people affected by temperature and precipitation extremes across the Middle East, and map the spatiotemporal variability of these events in areas hosting displaced people.

Materials and methods

We use global climate datasets to identify hotspots for extreme temperature and precipitation over 75 years (1950-2025), and population data (1975-2025) to find the number of people exposed to weather extremes across the Middle East. We also investigate the locations of refugee camps and similar settlements, to assess their exposure to weather extremes.

Results

We show that temperature and precipitation extremes occur in populated regions, and have impacted an increasing number of people since 1975. While the spatial extent of cold spells has decreased over time, the number of people experiencing cold extremes has increased. Both ends of the climate spectrum - extreme heat and cold, as well as heavy precipitation events and prolonged dry periods - are present across the region. We also expect to visualize the temporal trend of precipitation and temperature in selected displacement settlements across the region.

Conclusions

Our results demonstrate the presence of weather extremes in an understudied region, and its variability on a spatiotemporal scale. We also aim to conclude which populated areas have been exposed to such events historically, and if regions with high numbers of displaced people are especially exposed.



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1268 - Building Climate Resilience Among Older Adults A Participatory Spatial Assessment Of Resilience Dynamics And Determinants

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1. Background

Age-friendly cities and communities (AFCs) provide a promising framework for integrating climate resilience into land-use planning and urban design. However, empirical evidence remains limited on how AFC initiatives enhance the long-term and dynamic resilience of older adults through the combined capacities of climate change adaptation and disaster risk reduction. Effective resilience strategies should incorporate older adults' participation, health, indigenous knowledge, and place-based social and community supports to promote age-friendliness and reduce disaster risk. Accordingly, this study proposes an interdisciplinary, spatially explicit, and participatory resilience assessment approach to support evidence-based land-use planning and governance for ageing populations exposed to climate-related hazards.

2. Methods and data

Using the Taipei Metropolitan Area, Taiwan, as a case study, we develop the Framework of Resilience to Climate-Related Hazards for Older Adults (FRCHOA) to operationalize community-level capacity that foster resilience and age-friendly environments. The framework integrates age-friendly environmental attributes with older adults' socioeconomic conditions, health status, perceived disaster risk, environmental awareness, and well-being. A participatory approach combines focus group meetings and multi-criteria decision analysis (MCDA) to identify, weight, and spatialize resilience indicators. Participatory geographic information systems (PGIS), together with spatial statistics, cluster analysis, and spatial regression are applied to examine the spatial patterns and temporal dynamics of resilience from 2006 to 2016. Finally, data are collected from multiple databases, field surveys, and questionnaire surveys of older adults.

3. Results and conclusions

The results reveal significant special clustering of low-resilience areas and a progressive deterioration of resilience over time. Low-resilience areas exhibit a pronounced spatial shift from suburban zones toward urban cores and selected historic districts between 2006 and 2016. This trend is attributable to deficits in age-friendly physical and social environments, poorer health conditions, lower environmental awareness, and limited participation among older adults which collectively constrain adaptive capacity. Spatial regression results further indicate that aging resilience is significantly associated with demographic structure, accessibility, affordable housing, perceived risk, and access to resources. These findings provide spatially explicit evidence to inform targeted and integrated land-use planning and climate adaptation strategies for low-resilience hotspots, and supporting age-friendly and risk-resilient urban environments.



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2229 - Risk Informed Satellite Derived Shorelines For Tropical Coasts A Frugal Protocol Tested In Madagascar

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Tropical urbanized coasts face compound risks from cyclones, sea-level rise, and rapid land-use change. In many data-sparse regions, systematic shoreline monitoring remains absent, undermining risk-informed adaptation. Madagascar, among the most cyclone-exposed countries in the Southwest Indian Ocean, lacks operational shoreline datasets, limiting coastal policy and planning.

This study addresses this gap by proposing a cost-effective, reproducible protocol for Satellite-Derived Shorelines (SDS) using Sentinel-2 archives (2015–2025; 10-meter resolution) to produce shoreline time series supporting coastal risk assessment.

Two contrasting anthropized sandy coasts were observed: Mananjary (microtidal, southeast, open to the Indian Ocean) and Toliara (mesotidal, southwest, facing the Mozambique Channel). The protocol integrates four steps: (1) systematic scene inventory with region-of-interest cloud masks recalculated from Sentinel Scene Classification Layer and tailored to local conditions; (2) automated multi-parameter calibration of the Shoreline Analysis and Extraction Tool (SAET; Palomar-Vázquez et al., 2023); (3) quality control and SDS time-series generation; and (4) spatio-temporal analysis. Validation was conducted using co-dated very high resolution Pléiades imagery.

SAET achieved over 95% successful extractions across the study period. Validation yielded RMSE values of 5.78 m for microtidal and 6–9 m for mesotidal sites, indicating sub-pixel accuracy relative to Sentinel-2 resolution. Region-based cloud recalculation recovered up to 30% additional usable scenes, improving temporal resolution and enabling detection of short-term shoreline changes. Dense time series revealed morphodynamic variability and underscored the necessity of explicit local calibration and adaptive cloud masking.

This first SDS application for Madagascar at local context shows that operational, transferable monitoring is achievable using open data and tools. The protocol's modular design supports long-term coastal observation and resilience strategies, providing a scientific foundation for a future national coastal observatory.



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2291 - A Method For The Spatiotemporal Identification Of Compound Hydrometeorological Hazards In Norway Integrating Climate Reanalysis And Normalized Insurance Losses (1980 2024)

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A METHOD FOR THE SPATIOTEMPORAL IDENTIFICATION OF COMPOUND HYDROMETEOROLOGICAL HAZARDS IN NORWAY: INTEGRATING CLIMATE REANALYSIS AND NORMALIZED INSURANCE LOSSES (1980-2024)

Background/Hypothesis:

Extreme weather events can have devastating consequences on human societies and on the environment, with high-latitude regions such as Norway experiencing particularly rapid warming. Climate change is likely to increase the frequency and intensity of extreme weather events and, all else equal, increase disaster losses. However, disaster losses emerge from both physical hazards and evolving societal responses, including changes in exposure, wealth, and mitigation. Normalization is therefore essential to disentangle climate signals from socioeconomic change. Furthermore, extreme impacts frequently result from interactions between multiple drivers—compound events—rather than single hazards, yet research on these in Norway remains limited.

Materials and Methods:

An integrated framework is developed that combines hydroclimatic extreme event detection with disaster loss normalization to study weather-related impacts. Extreme events are identified and classified using machine-learning-based analysis of climate reanalysis data, with a focus on their spatiotemporal evolution, connectivity, and classification into compound and univariate event types. To link detected events to societal impacts, private insurance losses from natural disasters in Norway between 1980 and 2024 are normalized to estimate the insured losses that would be incurred if historical events were to recur under 2024 societal conditions. This study uses three factors to normalize losses – changes in inflation, changes in building cost, and the real wealth per housing unit over time.

Results:

This study will be the first to use downscaled climate reanalysis of Norway coupled with private insurance data of natural hazard events for the detection of hydrometeorological events. Furthermore, this coupled framework will be used to evaluate the difference in the impact of compound events, compared to univariate events.

Conclusions:

By integrating private insurance data with climate reanalysis, this research develops a novel framework that disentangles physical climate signals from socioeconomic change. Normalized insurance losses serve as an impact-based reference for extreme event detection and characterization, while long-term trends in insured losses are used to assess changes in hydroclimatic risk.



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C24.22-Hazards and Risks => Cryospheric Hazards in a Changing Climate: Global Perspectives on Risk, Monitoring, and Adaptation



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1166 - Glaciation Related Catastrophic Flooding Insights From A Prehistoric Perspective

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Glacial lake outburst flood (GLOF) is becoming increasingly a serious issue recently in glaciated zones such as the Himalayas and Alps. Flood events and consequent downstream damage to human-made structures and claiming of human lives have been reported. While detailed investigation of past cases and proper risk assessment of future occurrence are important and conducted in various localities in the world, we can learn also from prehistoric catastrophic flooding events that have been studied and reconstructed at various places, mostly in North America and Northern Eurasia. These events could have reached a few orders of magnitudes greater than the modern GLOFs in terms of discharge and volume of water involved, and they left strong evidence in the form of erosional landforms and sedimentary deposits. The reason for such huge scales is attributed to more extensive glaciation coverage and drainage reorganization during ice ages with respect to the conditions of modern times. Nevertheless, there are many elements in common between the prehistoric and modern GLOFs, such as mechanisms of glacier- and also sediment-dammed lake formation and failure, erosional and depositional features and processes, and approach in the research methodology. I will present history and examples of prehistoric catastrophic flood events studied to date.



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2442 - Developing A Climate Change Adaptation Baseline Using Climate Indices For The North West Province South Africa

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Climate change adaptation is essential for reducing vulnerability and building resilience to increasing climate risks such as heatwaves, droughts, and extreme rainfall events. At the national level, South Africa's National Climate Change Adaptation Strategy (NCCAS) and related policy frameworks provide broad guidance for adaptation across sectors and spheres of government, including provinces and municipalities. In addition, where climate change strategies exist, baseline climate risk assessments and clear metrics for monitoring progress are often absent or not comparable, leaving gaps in the evidence needed for targeted adaptation action. These gaps highlight the need for a spatially explicit adaptation baseline that captures current climate hazard patterns and vulnerabilities, providing a critical reference point for monitoring adaptation effectiveness and guiding future planning across the North West Province. Climate change adaptation planning requires spatial analysis to identify current climate risk patterns to support long-term monitoring. Therefore, this study aims to develop a climate change adaptation baseline for the North West Province using spatial climate indicators. This study will focus on two climate risks, namely: heatwaves and extreme rainfall, which are recognised as key drivers of vulnerability in the North West Province. The climate data will be obtained from ERA5 reanalysis, which provides daily gridded temperature and rainfall data. This study period will be from 1990 to 2025. Using the climdex R package and the ASSA climate index methodology, a suite of extreme climate indices will be calculated to quantify heatwaves and extreme rainfall. All indices will be aggregated to municipal boundaries and integrated with socio-economic data from Statistics South Africa to produce a composite climate-hazard baseline. The proposed baseline will provide a critical reference framework for monitoring future changes in climate risk and evaluating adaptation progress. This study will contribute to strengthening provincial adaptation planning and align with emerging adaptation monitoring frameworks.



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C24.22-Hazards and Risks => Resilience Dividends for Disaster Risk Reduction and Sustainable Development With Special Reference to Developing World



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1660 - Using Qualitative Gis Method For Community Participatory Flood Loss Assessment Of Mihe Town Zhenzhou China

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In the context of climate change and extreme weather events, community-based disaster management is critical for post-disaster recovery and resilience. On July 20, 2021, Zhengzhou City experienced an extreme rainstorm event that triggered China's most catastrophic flood disaster in the past decade, causing significant casualties and economic losses. Taking Mihe Town, affected by the "7.20" rainstorm and flood disaster in Zhengzhou, as an example, we propose Qualitative Data Visualization, a mixed-methods approach that integrates Public Participatory GIS (PPGIS), qualitative analysis, and spatial analysis, to explore the potential of community-participatory methods to complement expert-led assessments. The results show that: (1) Community participatory assessment exhibits subjective and interconnected characteristics. By incorporating emotional and spiritual losses, participatory assessment adds nuance to expert-led assessments that focus on material losses. (2) In terms of spatial distribution, community-participatory disaster loss reveals multi-scalar characteristics (spanning individual, household, and community levels) and is influenced by exposure types and residents' activities, manifesting combined centralised and dispersed spatial patterns. Participatory assessment can provide spatial nuance and implicit information about disaster loss based on the interpretation of expert-led assessment results. (3) The two assessments show fair agreement (weighted kappa = 0.23), demonstrating that neither alone fully captures disaster loss realities. Participatory assessment enables accuracy verification and parameter optimization for expert-led assessment, while their integration reveals community disaster-coping psychology and behaviour to develop targeted, resilience-focused mitigation policies.



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2451 - Food Insecurity And The Fortunate Index As Possible Indicators Of Recoverability After A Fast Onset Disaster

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Data in the public domain – such as Population Census and Household Survey data – can be used to ascertain the recoverability of areas at risk within a local government. This will enable local authorities to implement risk mitigation programmes to respond to fast-onset disasters, including floods and fires, and to assist those in need promptly. In most instances, people in these vulnerable areas are not resilient to catastrophes such as floods, fire and droughts. Floods and fire are fast-onset disasters that require a rapid response. Droughts are slow-onset disasters that, in theory, could be mitigated more quickly but are at risk of being ignored because the onset is not visible, especially in urban areas. The Fortunate Index comprises 11 indicators, selected by interviewees based on their sense of being fortunate when the indicators are present and of being unfortunate when they are lacking. The 11 indicators are based on South African (SA) census data variables and range from owning a permanent house and employment to accessing the Internet and having a post-matric qualification. The 11 indicators are then used to determine the level of fortunateness as revealed by the census data of a specific area. Food insecurity measures in South Africa, as shown in the 2016 household survey, are based on the Food Insecurity Experience Scale developed by the FAO. Areas of food insecurity and ill fortune, or unfortunateness, are identified and overlaid in a GIS to derive indices that indicate communities' ability to recover after a fast-onset disaster. Additional data, such as flood lines and fire risk categories, are used to plan for mitigative activities. This paper examines how to reduce and mitigate disaster risks, which are part of Sustainable Development Goal (SDG) 11: Sustainable Cities and Communities.



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2718 - Machine Learning–based Assessment Of Rainfall Induced Landslide Susceptibility In A Rapidly Urbanizing South African Municipality

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Rainfall-induced landslides represent one of the most severe hydrogeomorphic hazards, threatening lives, infrastructure, and economic stability, particularly in rapidly urbanizing landscapes. The rapidly urbanizing eThekweni Municipality in South Africa's KwaZulu-Natal Province has experienced a growing frequency of such events, driven by steep topography, deeply weathered lithologies, and increasingly intense rainfall. This study develops a robust multivariate machine learning (ML) framework to map landslide susceptibility by integrating topographic, geological, hydrological, climatic, and remote sensing-derived factors. A total of 91 precisely georeferenced rainfall-triggered landslides, paired with an equal number of non-landslide points, were used to train and validate five ML classifiers: Random Forest (RF), Extreme Gradient Boosting (XGB), Support Vector Machine (SVM), k-Nearest Neighbors (KNN), and Naïve Bayes (NB). Feature importance and interaction analyses identified slope, elevation, and proximity to dolerite dikes as dominant predictors, with a strong synergistic effect between slope and elevation. Model evaluation using repeated 10-fold cross-validation indicated excellent predictive skill (ROC-AUC > 0.90) across all models, with RF and XGB demonstrating superior accuracy, sensitivity, and specificity. The optimized RF model classified approximately 77% of the municipality as highly to very highly susceptible, encompassing over 90% of recorded landslides. Spatial patterns reveal elevated susceptibility in the steep southwestern, central, and northern sectors, while coastal plains remain largely stable. The proposed ML-driven framework underscores the value of data-driven, evidence-based approaches for high-resolution landslide hazard assessment, offering critical support for disaster risk reduction, spatial planning, and climate-resilient urban management in precipitation-sensitive regions.



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2779 - Landslide Hazard And Urban Vulnerability In The Expanding Shimla Region India

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Shimla, a major hill city in the northwestern Himalaya, has witnessed rapid urban expansion in recent decades, increasingly spreading over steep, fragile, and geologically sensitive slopes. This growth, coupled with intense monsoonal rainfall, road cutting, slope excavation, unregulated construction, and poor drainage management, has intensified landslide occurrences and their impacts on people and infrastructure. The present study assesses landslide hazard and urban vulnerability in Shimla, India, with the aim of identifying high-risk zones and understanding how physical slope instability interacts with urban exposure.

A geospatial multi-criteria approach is used to generate a landslide hazard zonation map by integrating key conditioning factors such as slope gradient, aspect, elevation, lithology, land use/land cover, proximity to drainage, road networks, and lineament density. These factors are analysed within a GIS environment using a weighted overlay method, supported by field observations and available landslide inventory records. Urban vulnerability is evaluated through indicators including population density, building concentration, land-use intensity, and the spatial distribution of critical infrastructure in relation to hazard-prone slopes.

The results indicate that high hazard and vulnerability zones are concentrated along transport corridors, densely built-up areas, and locations where slope modification and drainage blockage are common. The study highlights that landslide risk in Shimla is not solely controlled by natural geomorphic and climatic conditions but is significantly amplified by human interventions and weak land-use regulation.

The findings provide important inputs for disaster risk reduction and sustainable planning in Himalayan hill towns. The study recommends restricting construction on unstable slopes, strengthening slope stabilization and drainage systems, and integrating hazard zonation maps into urban development planning to enhance resilience and reduce landslide-related losses.



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3235 - Mapping Vulnerability Of Flood Displacement Global And In Country Disparity And Future Risk Of Human Displacement

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Background:

Floods are a major driver of disaster-induced internal displacement worldwide, yet the social conditions under which flood events lead to displacement vary considerably across countries and subnational areas. This study examines whether flood-displaced populations are systematically more vulnerable than the national populations within their respective countries, and identifies countries where such disparities coincide with high projected future flood displacement risk. Here, we define social vulnerability as the degree to which populations are sensitive to natural hazards and their capacity to respond to and recover from hazard impacts.

Materials and methods:

The analysis draws on the Global Profile of Internal Displacement (GPID) dataset developed by the International Organization for Migration (IOM), which links geolocated internal displacement events reported by the Internal Displacement Monitoring Centre (IDMC) with demographic and socioeconomic indicators. All flood-related displacement events recorded between 2018 and 2024 are extracted to characterize the vulnerability profiles of the affected locations. For each country, vulnerability indicators in displacement-affected areas are compared with corresponding national baseline values to quantify disparity. These disparities are then analyzed using multivariate techniques to identify dominant dimensions of social vulnerability and classify countries with similar profiles. To extend the analysis beyond observed events, the study integrates scenario-based modelling in CLIMADA to simulate future flood displacement risk under alternative climate (RCPs) and socioeconomic (SSPs) pathways over the 21st century.

Expected results and conclusion:

By combining projected displacement risk with empirical measures of disparity, the study will develop a framework to identify compound vulnerability hotspots. Our study provides globally comparable evidence on uneven geographies of flood displacement and vulnerability across and within countries. It also offers a basis for more targeted humanitarian response, disaster risk reduction, and resilience planning, while supporting more equitable anticipatory action and adaptation planning in line with Sustainable Development Goal 10 on reducing inequality within and among countries.



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C24.23-Health and Environment => Access to Healthcare for Disadvantaged Groups



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1317 - The Built Environment Matters Findings On Mental Health Service Utilisation By Indigenous Peoples In South East Queensland Australia Using Medicare Microdata

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The mental health and wellbeing of Indigenous peoples are profoundly shaped by the legacy of colonisation, including historical dispossession, cultural disruption, and the imposition of systemic inequities. In Australia, the consequences of this history are evident in the significant mental health challenges faced by Aboriginal and Torres Strait Islander peoples. Mental health conditions and substance use issues are the leading contributors to the overall disease burden for Indigenous Australians. Addressing this burden requires understanding the complex social, cultural, and environmental determinants of health, which is essential for redressing health inequalities and improving mental health outcomes for Indigenous populations.

This study examines how the built environment factors at a neighbourhood-level are associated with mental health service (MHS) utilisation by Indigenous peoples in South-East Queensland, Australia, while controlling for individual socio-demographic characteristics. Using population-based Medicare microdata linked with administrative records, we quantify individual-level MHS utilisation and employ multi-level negative binomial regression models to assess the link between MHS utilisation and environmental features. Our results show that built environment factors together with socio-demographic characteristics are significantly related to Indigenous individuals' MHS utilisation. Greater MHS utilisation is associated with living in neighbourhoods with greater green space amongst younger individuals, and with living in inner regional areas (i.e., outskirts of major cities) amongst individuals with lower family incomes. Less MHS utilisation is associated with living in neighbourhoods with greater green space amongst older individuals, with living in inner regional areas amongst those with higher incomes or two-family households, and with living in neighbourhoods with higher housing diversity amongst individuals with higher family incomes or larger households with three or more families. Furthermore, while overall lower MHS utilisation is linked to living in neighbourhoods with limited public transit accessibility and to residing in areas with better street network connectivity, these built environment conditions are associated with higher MHS utilisation among individuals needing assistance with daily living activities. These findings offer important insights into how built environment factors shape Indigenous peoples' engagement with MHSs, with potential to inform policymakers and practitioners in designing targeted interventions to improve mental health outcomes for Indigenous peoples.



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1410 - Barriers To Healthcare Access Among Disadvantaged Groups Insights From Homeless Communities In Bucharest

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Homelessness represents a significant challenge for disadvantaged populations worldwide, including in Romania. Individuals experiencing homelessness are disproportionately affected by poor health outcomes and face a higher risk of premature mortality, largely due to financial hardship and limited access to healthcare services.

This paper undertakes an in-depth exploration of the multifaceted experiences and perceived barriers encountered by individuals experiencing homelessness in their efforts to access medical care within Bucharest, the capital city of Romania. Employing a qualitative research design, the study draws on a series of comprehensive, face-to-face semi-structured interviews not only with homeless individuals but also with key representatives from institutions and non-governmental organisations (NGOs) engaged in providing social and health-related support to this vulnerable population.

The study uses an inductive-deductive approach and thematic analysis to identify barriers that homeless individuals face in accessing healthcare. The findings show that discrimination and stigmatisation from healthcare providers and negative attitudes from staff and other patients prevent this vulnerable population from receiving medical care.

Previous negative experiences have resulted in considerable mistrust of the healthcare system among people experiencing homelessness. The fear of being judged or mistreated often acts as a further barrier, deterring them from accessing essential medical services. To effectively address these issues, it is imperative to implement a new strategy that promotes awareness, tackles discrimination, enhances health literacy, and strengthens healthcare infrastructure.



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1802 - A Qualitative Exploration Of Experiences And Perceived Barriers Among Roma Women In Accessing Reproductive Health Services In Romania

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Access to reproductive health services plays a critical role in ensuring the health and well-being of mothers and their children. For disadvantaged groups, such as the Roma communities, securing adequate access to these essential services is especially challenging. The prevalence of low socio-economic status within Roma populations—driven by factors like high unemployment rates, food insecurity, and substandard living conditions—further exacerbates these difficulties.

This paper explores the challenges and barriers that Roma women face in accessing reproductive healthcare services in Romania, including availability of services, frequency of use, and reasons for service denial. Furthermore, the study investigates the underlying causes that contribute to these obstacles in accessing essential reproductive health services.

The research is based on 50 in-depth interviews conducted with Roma women aged between 18 and 60 living in rural areas near Bucharest. During these interviews, participants shared their personal experiences regarding pregnancy and the immediate postpartum period. Their narratives provide valuable insight into the realities faced by Roma women seeking reproductive health care. Findings show that in Romania, Roma women face systemic barriers within healthcare system, financial constraints, and experience limited awareness regarding available reproductive health services, leading to minimal or infrequent access. Issues such as social isolation, depression, chronic stress, and high rates of domestic violence further threaten the well-being of Roma mothers and children.



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1993 - Producing (im)mobilities Spatial Injustice And The Geographies Of Healthcare Access For Wheelchair Users In Taiwan

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Disparities in healthcare access for people with physical impairments persist despite universal coverage commitments, revealing how ableist spatial production systematically excludes marginalized bodies. Drawing on critical disability geography and mobilities theory, this paper examines how healthcare spaces and transport infrastructures materially embed able-bodied normativity, generating unequal geographies of care. Through qualitative interviews with twenty wheelchair users in Taiwan, this study analyzes the body-space relations that constrain therapeutic mobilities and reproduce spatial injustice. Findings reveal multi-scalar exclusionary mechanisms: community clinics remain physically inaccessible through architectural barriers (steps, inadequate ramps, narrow corridors), forcing wheelchair users into distant hospitals and fragmenting care pathways. Hospital complexes exhibit fractured mobility assemblages—broken pavements, obstructed ramps, poorly distributed elevators—that push disabled bodies into traffic lanes and dependence on strangers. Diagnostic equipment assumes standing, mobile bodies, requiring precarious manual transfers that impose cumulative economic, corporeal, and affective burdens on patients and care networks. Situating these embodied experiences within geographies of care and spatial justice frameworks, this study argues that ableist healthcare spaces function as technologies of exclusion, transforming impairment into disability through environmental design. Equitable access demands not individualized accommodations but systemic spatial transformation through universal design and inclusive planning practices. This study contributes to critical disability geography by theorizing how therapeutic landscapes reproduce or challenge ableism, and advances mobilities scholarship by illuminating how (im)mobility regimes structure differentiated access to essential care.



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C24.23-Health and Environment => Change, Public Health, and Food Security



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2170 - Maternal Socioeconomic Factors Feeding Practices And Child Malnutrition In Urban India

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Background: Malnutrition remains a major global public health challenge, contributing to nearly 45% of deaths among children under five years of age. In 2020, an estimated 149 million children were stunted, and 45 million were wasted worldwide, with low- and middle-income countries bearing a disproportionate burden. In India, rapid urbanisation has intensified nutritional disparities, resulting in the coexistence of undernutrition and emerging risks of overweight and obesity. This study examines spatial variations in child feeding practices and malnutrition across urban areas of Indian states and Union Territories (UTs) and analyses the association between breastfeeding behaviour, maternal characteristics, household conditions, and nutritional outcomes among children under five years.

Methods: Secondary data from the National Family Health Survey-5 (NFHS-5, 2019–21) were analysed. Urban-level indicators of infant and young child feeding practices, such as early initiation of breastfeeding, exclusive breastfeeding under six months, and adequate diet among breastfed children aged 6–23 months, were assessed alongside anthropometric indicators of stunting, wasting, severe wasting, and underweight. Descriptive statistics, range-based classification, spatial mapping in ArcGIS 10.8, and Pearson correlation analysis in IBM SPSS Statistics 20 were employed.

Results: Marked inter-state disparities were observed across urban India. States such as Kerala, Odisha, and Mizoram demonstrated better breastfeeding practices and lower prevalence of child malnutrition, whereas Gujarat, Maharashtra, Bihar, and Jharkhand exhibited poorer feeding behaviours and higher levels of stunting, wasting, and underweight. Women's education and institutional delivery were positively associated with optimal feeding practices, whereas low maternal body mass index (BMI) was strongly positively associated with child undernutrition. Adequate diet among breastfed children aged 6–23 months was significantly associated with reduced wasting, severe wasting, and underweight.

Conclusion: Significant nutritional inequities persist in urban India despite national and global commitments under the Sustainable Development Goals. Strengthening breastfeeding promotion, improving maternal nutritional status, and implementing targeted, state-specific, and multi-sectoral interventions are essential to accelerate progress towards eliminating child malnutrition.



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2323 - R2r From Recipe To Resilience Using Ai Driven Data Management Of Traditional Tunisian Cultural Heritage And Sustainable Food Security

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Background:

The erosion of traditional Tunisian recipes and culinary heritage threatens not only the inter-generational transmission that sustains cultural identity, but also the very foundation of a sustainable, resilient, and nutritionally local-rich food system. We hypothesize that a dedicated AI system can preserve this living culinary knowledge — transforming it into an actionable resource for cultural continuity and food security by enabling interactive storytelling, guided dialogue, and personalized transmission of heritage.

Materials and Methods:

We developed a conversational AI system designed to digitally archive and animate Tunisia's food heritage. The system integrates multilingual transformer models, specifically fine-tuned on Tunisian dialectal corpora, with a structured Food Heritage Knowledge Graph. This graph semantically links recipes, ingredients, nutritional profiles, historical origins, and regional variations. A hybrid dialogue manager, powered by a culturally aware chatbot, navigates user queries from simple recipe retrieval to exploring a dish's cultural significance. This methodology addresses key challenges in dialect diversity, data scarcity, and the need for culturally sensitive engagement.

Results:

The implemented system successfully provides personalized, interactive access to a growing repository of authentic recipes and their associated cultural narratives. Initial user testing demonstrated high engagement, with the chatbot effectively facilitating exploration and building trust. Quantitative analysis confirmed the system's accuracy in retrieving and contextualizing culinary information. Qualitative feedback highlighted its role in reviving interest in traditional cooking practices. This proves AI can capture, structure, and share complex culinary knowledge, establishing a foundational digital resource for the heritage ecosystem.

Conclusions:

This project confirms that AI-driven data management is a powerful tool for building socio-cultural and nutritional resilience. By safeguarding culinary heritage, the platform supports cultural preservation, promotes sustainable gastronomic tourism, and strengthens community-level food security. Future work will expand dialectal coverage through federated learning and enhance contextual understanding with advanced memory models, ensuring the system evolves as a living, inclusive resource for sustainable food systems.



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C24.23-Health and Environment => Healthscapes in Transition: Spatial Contexts of Health and Wellbeing



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1246 - Exploring Mobility Challenges And Support Systems For Individuals With Physical Disabilities An Exploratory Study Of Public And Specialized Transportation Access In Bucharest

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People with physical disabilities in Bucharest face multiple obstacles in accessing transport infrastructure, which negatively impact their social inclusion and daily life. Although regulations exist, their implementation remains deficient, creating gaps between policy and reality.

This exploratory study aims to identify the main barriers for people with physical disabilities when using various forms of transport in Bucharest: surface transport (bus, tram, trolleybus), metro, and specialized transport (public or provided by NGOs).

The analysis of the transportation network and existing facilities for people with disabilities in Bucharest's public transport system (such as low-floor buses, elevators in metro stations, and ramps), revealed a complex mobility landscape.

This research adopts a qualitative approach, using 50 semi-structured interviews with individuals representing a range of physical disabilities, ages, and educational backgrounds. The interviews focussed on participants' personal experiences, the challenges they faced, and the adaptation measures currently in place.

Results show that challenges differ based on age, type of disability, with older individuals or those with more severe disabilities facing additional or compounded difficulties.

The study also reveal that people with physical disabilities in Bucharest encounter significant obstacles related to inadequate transport infrastructure and insufficient implementation of regulations; while some accessible features exist (low-floor buses, elevators, ramps), their availability and quality are often insufficient or unreliable, further limiting mobility.

This exploratory study will provide a basis for further research and policy development aimed at improving transportation access and social inclusion for people with physical disabilities in Bucharest.



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1407 - Spatial Accessibility To Dental Care In South West Oltenia Romania Grid Based Modelling With Network Travel Times

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Spatial accessibility represents a fundamental aspect of achieving health equity, particularly in the context of dental care. In Romania, dental care facilities tend to be concentrated within urban centres, and population living in rural areas are often confronted with significant access barriers, including longer travel times and limited options for dental care.

This study explores the spatial distribution and accessibility of dental care services in South-West Oltenia, Romania. It is grounded in the hypothesis that a pronounced core-periphery pattern emerges, largely shaped by transportation connectivity and closely associated with areas experiencing increased social and economic vulnerability.

Dental care locations are geocoded and considered as service providers while a population grid (e.g., Eurostat GISCO or WorldPop) is used to represent potential demand. Travel-time impedance is computed on the road network using routing services based on OpenStreetMap. Accessibility is estimated for each grid cell using an enhanced two-step floating catchment area approach with multiple travel-time catchments (15, 30 and 45 minutes) and distance-decay weighting. Sensitivity analyses compare results across catchment thresholds and alternative decay specifications.

Preliminary outputs show highest levels of accessibility around the main urban centres, while extensive areas with limited access are found in peripheral and rural areas that lack robust transportation connections. The grid-based approach enables identification of small-scale „pockets” of poor accessibility, near regional borders and along weak road corridors, areas that are often overlooked when relying solely on municipal-level averages. The lowest-access areas are stable across model variants, while intermediate zones are more sensitive to assumptions about catchment size and distance-decay parameters.

Integrating network-based travel times with a grid-based enhanced floating catchment framework provide a robust and replicable way to highlight dental care deserts prioritising equity-driven interventions beyond major administrative centres. This approach facilitates strategic workforce allocation, the deployment of mobile dental services, and transportation-informed health planning, particularly in regions characterized by pronounced urban-rural disparities.



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1437 - From Disparities To Access Tackling Cardiovascular Care Deserts In Romania

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Background:

Cardiovascular deserts are territorially disadvantaged areas characterised by limited access to medical infrastructure, specialised healthcare professionals and diagnostic or therapeutic resources required for the effective management of cardiovascular diseases (CVDs). Romania records the highest incidence and mortality from CVDs in Europe, a situation exacerbated by rapid population ageing and increasing demand for specialised care. Despite nearly half of the population residing in rural areas, healthcare resources remain highly concentrated in a small number of large urban centres, resulting in pronounced spatial inequalities in access to cardiovascular services.

Methods:

This study employs a spatial accessibility approach to identify cardiovascular (CV) deserts across Romania. Travel distances and times to specialised cardiovascular facilities were calculated using the Google Maps Application Programming Interface (API) Distance Matrix service and integrated with national open-access datasets on population distribution, demographic structure, healthcare workforce availability and CVD-related mortality. Areas were classified according to predefined accessibility thresholds.

Results:

The analysis shows that over 64% of Romania's population lives in areas with inadequate access to specialised cardiovascular care, requiring travel distances greater than 60 km and travel times exceeding 30 minutes to reach the nearest appropriate facility. In addition, approximately 14% of the population resides in areas characterised by a high degree of cardiovascular desertification. These areas are primarily located in northeastern, southern and western Romania and are associated with population ageing, elevated CVD mortality rates and shortages of both general practitioners and cardiologists.

Conclusions:

Cardiovascular deserts in Romania largely overlap mountainous regions, the Danube Delta and remote rural areas with deficient transport infrastructure. Addressing these disparities requires integrated policy responses, including the expansion of telemedicine and mobile healthcare services, the strengthening of community-based healthcare provision and targeted interventions to improve equitable access to specialised cardiovascular care.



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1641 - Spirits Herbs And Markets Urban Rural Differences In Traditional Medicine In Bangladesh

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Background and Hypothesis:

Bangladesh has experienced significant expansion in its healthcare system; however, traditional medicine continues to play an important role in both rural and urban areas. While researchers and the government of Bangladesh have focused on biomedical services, traditional medicine is often overlooked or regarded as a marginalized, outdated customs. This study employs a healthscapes perspective to challenge this assumption, arguing that traditional medicine is spatially differentiated between urban and rural contexts, shaped by religious orientations, institutionalization, and translocal processes.

Materials and Methods:

The study draws on seven months of qualitative fieldwork conducted in Tangail District, Bangladesh. Semi-structured interviews and participant observation were carried out with rural traditional healers (kobiraj) and owners of traditional medicine shops in Tangail city. Documents from the colonial period were analyzed to contextualize shifts in medical authority and spatial organization.

Results:

Rural kobiraj conceptualized illness as engagement with localized spirits such as jin and bhut, emphasizing exorcism, ritual practices, amulets, and folk remedies embedded in domestic and community spaces. Some possessed herbal knowledge acquired through ties with minority groups or overseas learning. They often framed their work as humanitarian service rather than commercial practice; they hardly charged treatment fees. In contrast, urban kobiraj prioritized orally administered herbal medicines and rejected ritual- or incantation-based healing. They presented their practices as scientific and practical to set themselves apart from rural healers. Some urban Muslim kobiraj preferred the title hakim (Unani practitioner). Urban practice was embedded in commercial settings and sustained through the sale of medicinal products.

Conclusions:

The findings demonstrate that traditional medicine in Bangladesh is neither static nor uniform but constituted through spatially differentiated practices. Limited formal systematization enables adaptive diversity across places, producing dynamic healthscapes in which urban and rural forms of traditional medicine are continuously reshaped through mobility, religion, and everyday care-seeking practices.



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1712 - Using Geospatial Analysis To Identify Gaps In Metropolitan Healthcare Services Accessibility

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Access to healthcare services in metropolitan areas is a discussed subject in many developed or developing countries, especially in a post-socialist state, with numerous issues of sanitary infrastructure. In many cases, access times of the population to medical infrastructure can reach alarming results in areas like Bucharest-Ilfov, where densely populated sections still remain without a good access to basic healthcare services. Geospatial analysis can allow the identification of accessibility barriers and gaps in territorial systems. In this study, geocoding tool was used for creating a metropolitan medical facilities data base, divided into three categories (primary, secondary and tertiary care), which were the basis for network analyst analysis, used for calculating timing areas and accessibility classes. Following five accessibility scenarios, depending by the traffic hour, the study quantifies different accessibility results, which are later reported to demographics. The results show that even when accessibility infrastructure can constantly improve and expand inside the metropolitan area, at peak times and even during off-peak hours, access can gracefully exceed critical times, especially in the case of tertiary care units, which are usually situated mostly only in the metropolitan core. However, the peripheral localities of metropolitan area, that contains mainly in rural population, facing aging and lower incomes are registering very low values for all scenarios. Gap areas in accessibility to different medical facilities are more than visible, proving that the need to plan medical infrastructure according to the real demand in the territory is critical.



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1742 - The Prowd Project Improving Proximity Without Density In Terms Of Healthcare Provision

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Urban land accounts for only a fraction of Earth's surface (about 3%) (European Commission, 2025a), while accommodating about 58% of the world's population. The concept of an urban neighbourhood unit was developed by Perry (2011) and, over time, has become one of the most discussed planning topics, reshaped by subsequent urban movements. The concept of the ideal neighbourhood developed to incorporate features such as transit-oriented development (TOD), new urbanism, and smart growth. The surge in demand for proximity to amenities, where one can reach essential goods, services, and green spaces within a short walk or bike ride, underscored how the COVID-19 pandemic conditions made local livability a public health priority. Notably, cycling and pedestrian activity increased during and after the pandemic. The most recent model in urban planning/design is termed the 15-minute city, based on eco-urbanism solutions and advocates that essential services and key amenities classified under living, working, commerce, healthcare, education, and entertainment (visit a doctor, buy necessary things, take children to school, organise leisure activities) should be within 15 minutes by non-polluting forms of transport (Moreno et al., 2021; Mouratidis, 2024). The World Health Organisation (2023) warns that urban air quality is a growing concern, with the number of urban residents exposed to air pollution now 2.5 times higher than recommended levels. Increased walking has been widely lauded across several scientific fields: from transport (decreasing pollutant emissions and vehicular congestion) to health (lowering cardiovascular, mental, and obesity-related disease risks) to sociology (reducing exclusion and increasing opportunities for social encounters in public spaces). A 15-minute city's three pillars (inclusion, safety, and health) can be achieved through physical planning and community building. PROWD (PROximity Without Density) rethinks the 15-minute city for low-density urban areas on the metropolitan fringe. Instead of relying on costly infrastructure or urban densification, it focuses on reducing car dependency by recognising and building on existing "non-conventional" initiatives already promoted by residents, associations, and small enterprises in fields such as education, healthcare, sport and well-being, trade, and mobility.



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1790 - Living In Education Desert How Spatial Barriers To Education Shape Health Social Outcomes And Educational Pathways

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Ensuring equitable access to education is a central pillar of the Sustainable Development Goals (SDG 4), yet significant spatial disparities persist between urban and rural areas in Romania. This study introduces the concept of “education deserts”—defined as settlements where the nearest high school is beyond a 20-minute drive or 25 km distance—to investigate the cascading effects of spatial exclusion on the population’s health, socio-economic status, and educational pathways. Using Open-Source demographic data and GIS-based network analysis (Open Route Service API), we developed a multidimensional Education Desert Index (EDI) that integrates potential demand with structural access hardships. Results indicate that 34.3% of Romanian administrative units are education deserts, affecting 15.2% of the high school-aged population. The analysis reveals linkages between these spatial barriers and broader quality-of-life outcomes: education deserts significantly overlap with economically disadvantaged regions characterized by low income and infrastructural deficits. This suggests that spatial inaccessibility depresses local productivity and earnings by limiting human capital accumulation. Furthermore, the study highlights the health implications of long commutes, noting that excessive travel times are associated with sleep deprivation and reduced cognitive function, while lower educational attainment in these areas correlates with poorer long-term health behaviours. Consequently, living in an education desert is linked to higher rates of early school leaving and lower transition rates to tertiary education. These findings underscore that education deserts are not merely a logistical challenge but a driver of deep-seated socio-economic and health inequalities, requiring targeted policy interventions in transport and infrastructure.



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2239 - Rethinking Ayurveda Wellness Tourism In A Heritage City Patient Based Evidence From Jaipur India

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Background/Hypothesis

Wellness tourism has emerged as an important dimension of contemporary tourism, often intersecting with cultural and heritage travel. In India, Ayurveda has gained prominence as a wellness option for both domestic and international tourists. However, existing studies largely focus on destinations, policies, or service providers, while the perspectives of wellness tourists—patients remain underexplored, particularly in heritage cities. This study is based on the hypothesis that tourists visiting Jaipur primarily for heritage purposes increasingly engage in Ayurveda wellness experiences as a complementary activity, revealing both opportunities and service-related gaps.

Materials and Methods

The study is based on a questionnaire survey conducted among national and international patients visiting selected Ayurveda wellness centres in Jaipur. The multipurpose questionnaire captured data related to travel purpose, reasons for choosing Ayurveda, treatment-related perceptions, and challenges encountered. The collected responses were analysed using descriptive statistical techniques and thematic interpretation to identify dominant patterns and recurring issues.

Results

The findings indicate that heritage tourism remained the primary travel purpose for most respondents, while Ayurveda wellness functioned as a complementary dimension associated with relaxation, preventive care, and cultural engagement. International patients showed a stronger preference for traditional and authentic treatment approaches, whereas domestic patients largely sought rejuvenation and short-term therapies. Despite generally positive perceptions, several issues requiring improvement were identified, including limited pre-visit information, communication barriers, time constraints in treatment delivery, lack of standardised service quality across centres, and weak integration with the city's tourism framework.

Conclusions

The study concludes that Ayurveda wellness tourism in Jaipur functions as an integrated heritage—wellness dimension rather than a standalone tourism product. Patient-based findings highlight both the potential and the limitations of incorporating traditional healing systems within heritage destinations. Addressing identified gaps can contribute to more sustainable and spatially integrated wellness tourism development.



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2386 - Neighborhood Effect Averaging Revisited Why It Matters In Geographic Social Science And Environmental Health Research

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The neighborhood effect averaging problem (NEAP) is a fundamental methodological problem that might affect the accuracy and reliability of assessments of individual exposure to mobility-dependent environmental factors (e.g., noise, air pollution, and green space) and its health impacts. It was discovered by Kwan in 2018 based on several studies on people's exposure to air pollution. While these studies did not put forward the idea of neighborhood effect averaging, their results indicate that individuals' mobility-based exposures tend toward the average of the population or participants of the study area when compared to the corresponding residence-based exposures. They thus provide important early evidence of the NEAP in individual exposure to air pollution and highlight the need to consider people's daily mobility and exposures at locations other than their residential neighborhoods when assessing people's environmental exposures. Since the discovery of the NEAP in 2018, subsequent empirical studies have been conducted to provide further evidence of the existence of the NEAP when examining individuals' mobility-based exposures.

The NEAP is a fundamental issue with significant impacts on the accuracy and reliability of the results of all studies on the influence of mobility-dependent environmental factors on human health behaviors and outcomes. Ignoring it may lead to erroneous conclusions and ineffective (or even wrong) health intervention measures. These studies not only include many studies in geography and social sciences but also almost all studies in environmental health, environmental epidemiology, and exposure science. It is thus important for researchers in these disciplines to realize that the NEAP exists (as a form of systematic exposure measurement error) and how it may influence research findings. It is also necessary to deepen our understanding of the nature of the NEAP and how it can be mitigated in future research. This paper seeks to highlight research progress on and misunderstanding of the NEAP, clarify its nature, and call for more future research on specific aspects of the problem, with the hope of improving the reliability of research findings in geographic, social science, and environmental health research.



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24.23-Health and Environment => Revisiting Person- Environment Fit for Active and Healthy Aging: International Experience



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1006 - Spatial Stratification Of Multiple Deprivation Changing Lived Experiences And Varying Health Outcomes Among Older Adults Implications For Planning Age Friendly Cities

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Multiple deprivation encompasses not only economic disadvantage but also inequalities in physical and social environments that pose critical barriers to healthy aging. However, how older adults perceive deprivation and how it manifests differently across places remain underexplored. In light of this, the study aims to examine how distinct domains of deprivation shape the lived experiences and health outcomes of older adults, and the geographic variation in these associations in Hong Kong—an ultra-dense Asian metropolis. Three questions are proposed: 1) How is neighborhood deprivation associated with older adults' lived experiences? 2) How are these lived experiences associated with health? 3) How do these associations vary spatially? Structural equation modeling and geographically weighted regression were used to analyze survey data from 541 older adults in Hong Kong. Neighborhood deprivation was measured using the Hong Kong Index of Multiple Deprivation. Findings reveal that in Hong Kong, highly deprived neighborhoods are likely to be located in areas with ultra-high residential density, where living conditions are substandard (e.g., subdivided units). Urban areas that used to have a large proportion of resettlement and industrial lands are likely to become deprived owing to the uneven distribution of urban amenities and the fragmentation of residential areas by industrial land. The questionnaire analysis shows the spatial stratification of deprivation: older adults in fragmented, employment-deprived neighborhoods are more likely to experience weak social cohesion and loneliness, whereas in dense urban neighborhoods, strong social ties and mixed use buffer loneliness more effectively despite living environmental deprivation near the former industrial site. These findings highlight the need for neighborhood-specific planning to mitigate deprivation and support healthy aging.



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1026 - Multiple Deprivation Changing Lived Experiences And Varying Health Outcomes Among Older Adults Implications For Planning Age Friendly Cities

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Multiple deprivation encompasses not only economic disadvantage but also inequalities in physical and social environments that pose critical barriers to healthy aging. However, how older adults perceive deprivation and how it manifests differently across places remain underexplored. In light of this, the study aims to examine how distinct domains of deprivation shape the lived experiences and health outcomes of older adults, and the geographic variation in these associations in Hong Kong—an ultra-dense Asian metropolis. Three questions are proposed: 1) How is neighborhood deprivation associated with older adults' lived experiences? 2) How are these lived experiences associated with health? 3) How do these associations vary spatially? Structural equation modeling and geographically weighted regression were used to analyze survey data from 541 older adults in Hong Kong. Neighborhood deprivation was measured using the Hong Kong Index of Multiple Deprivation. Highly deprived neighborhoods are likely to be located in areas with ultra-high residential density, where living conditions are substandard (e.g., subdivided units). Urban areas that used to have a large proportion of resettlement and industrial lands are likely to become deprived owing to the uneven distribution of urban amenities and the fragmentation of residential areas by industrial land. The analysis also shows the spatial stratification of deprivation: older adults in fragmented, employment-deprived neighborhoods are more likely to experience weak social cohesion and loneliness, whereas in dense urban neighborhoods, strong social ties and mixed use buffer loneliness more effectively despite living environmental deprivation near the former industrial site. These findings highlight the need for neighborhood-specific planning to mitigate deprivation and support healthy aging.



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1836 - Ageing In Urban Environments Evidence From Croatia

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Croatia is among the countries experiencing one of the most advanced processes of population ageing. Despite this, the participation of older adults, in terms of applying their knowledge and skills across various aspects of everyday life, remains relatively low. The aim of this paper is to examine the opportunities and limitations for active and healthy ageing among older adults ageing in place within urban environments in Croatia. It presents findings from a qualitative study of 67 adults aged 65 and over residing in Croatian cities. Data were collected through semi-structured interviews conducted in the three cities: Zagreb, Vinkovci, and Umag. The participants indicated that, compared to rural areas, urban living offers significant advantages for older adults. As the biggest issue in old age, they highlighted low incomes, which are mostly pensions that represent the primary, and often the only, source of financial support. Along with health challenges, these factors significantly limit older adults' ability to fully engage in urban opportunities for an active lifestyle. Their level of participation, within the constraints of health and functional capacity, is shaped by past lifestyle choices, the range of their interests, financial resources, and the support available from their environment. Ageing in place within Croatian cities requires modifications to the urban built environment, along with the provision of services and activities tailored to older adults' needs, to support healthy, active, and independent living, thereby enhancing their overall well-being.



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2129 - Urban Walkability And Health Outcomes Among Older Adults Evidence From Delhi India

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Background/Hypothesis

India's rapid population ageing has intensified concerns about the links between urban design, mobility, and health, particularly in large metropolitan regions such as Delhi where spatial inequalities in infrastructure are pronounced. This study hypothesises that neighbourhoods with higher levels of walkability characterised by better pedestrian infrastructure, accessibility, and safety are associated with improved physical health, social engagement, and overall well-being among older adults.

Materials and Methods

The study adopts a descriptive analytical design based entirely on secondary data sources. Demographic and health indicators were drawn from the Census of India (2011) and the National Sample Survey (76th Round, 2018). Urban infrastructure and planning data were sourced from the Comprehensive Mobility Plan for Delhi (2019), the Delhi Development Authority's Master Plan (MPD 2041), and the Ministry of Housing and Urban Affairs' Ease of Living Index (2021). Walkability indicators including pedestrian network density, road safety statistics, and access to green and public spaces were derived from OpenStreetMap and Delhi Transport Department datasets. A composite Walkability Health Index was constructed using normalised indicators covering (a) physical environment, (b) safety, and (c) health outcomes. Correlation and regression analyses were applied across municipal zones to examine associations between walkability and elderly health outcomes.

Results

The findings reveal that areas with higher walkability, particularly in Central and South Delhi, exhibit better self-reported physical health and greater participation in outdoor activities among older adults. In contrast, East and North-West Delhi show lower walkability scores, higher mobility-related ailments, and reduced social interaction. Gender and income disparities persist, with elderly women and low-income groups facing greater mobility constraints.

Conclusions

Urban walkability emerges as a critical determinant of healthy ageing in Delhi. Integrating age-sensitive, pedestrian-oriented planning into urban policy frameworks can enhance equitable mobility, autonomy, and well-being for the elderly population.



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C24.23-Health and Environment => Trafficking in Different Targets: Geographies of Illicit Mobility



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1474 - Laundering Smuggled Chelonians Through The Labeling System A Crime Script Analysis

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The Illegal Wildlife Trade (IWT) has emerged as the world's fourth-largest transnational organized crime, severely threatening global biodiversity and regional security. Chelonians, among the most endangered vertebrate groups, face intensifying pressure from poaching and smuggling driven by the rising exotic pet market. Although China has implemented a labeling-based permit system to balance conservation with utilization, regulatory loopholes increase the risk of "laundering" smuggled species. To uncover this concealed process, based on 642 court verdicts (2014–2021) and field surveys in key trade hotspots, we applied crime script analysis to systematically examine the illegal chelonian trade chain. Our three-stage analysis (preparation, execution, and post-crime) reveals that the trade is concentrated in southern provinces, with common concealment and transport tactics including hidden vehicle compartments for overland transport and concealed luggage for air transport. High-value protected species are consistently the main targets. Further analysis identifies two distinct laundering pathways: freshwater turtles exploit the limited traceability of official identification cards, whereas tortoises enter licensed facilities through manipulation of breeding permits and quota reporting. Both pathways reflect systemic failures in linking official documentation to individual animals. This process-oriented framework goes beyond describing trade scale, precisely identifying vulnerabilities at each stage of the criminal chain, thereby providing a scientific basis for targeted enforcement, policy interventions, and species protection. The study suggests that future governance must focus on closing the institutional gap where documentation is decoupled from individual animals. Furthermore, it advocates for a coordinated division of labor among customs, forestry, and public security agencies based on script stages to establish a robust monitoring and early-warning system.



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1863 - The Geography Of Illicit Mobility Theoretical Framework Reconstruction And Empirical Practices

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As a manifestation of “shadow globalization,” illicit mobility encompasses diverse forms such as human trafficking, wildlife smuggling, drug circulation, illicit trade in cultural relics, and the transfer of illicit funds and data. It represents a distinct geographical process that profoundly reshapes geopolitics and border security. Current research largely focuses on static mapping of single crime types, lacking a unified theoretical explanation for the spatio-temporal mechanisms of illicit mobility—specifically its characteristics of concealment, dependence, and resistance. To address this gap, this study adopts the Coupling Magic Cube as a macro-ontological basis, conceptualizing illicit mobility as nonlinear interactions between distant human-environment systems. On this basis, the paper proposes theoretical innovations and integrations across three dimensions. First, by modifying the Push-Pull theory and Spatial Interaction models, we propose the “Regulatory Topography & Flow Refraction” hypothesis. This hypothesis views cross-national legal and institutional differences as an undulating “regulatory topography,” explaining why illicit flows deviate from shortest geographical paths and undergo “refraction” to seek “regulatory hollows” with minimal resistance. Second, by deepening Actor-Network Theory (ANT), we construct a “Parasitic-Host Network Embedding” perspective. This reveals that illicit mobility does not exist independently; rather, like a parasite, it is deeply embedded within the “host” infrastructures of licit logistics, finance, and information, achieving covert transmission through camouflage. Third, breaking through traditional criminology’s reliance on static environments, we propose the “Spatial Porosity & Osmosis” model. This model treats borders and control nodes as semi-permeable membranes with dynamic “porosity,” positing that illicit actors keenly exploit spatio-temporal regulatory loopholes (such as shift changes or surveillance blind spots) to achieve cross-border penetration via an “osmosis” mechanism. Based on this framework, the paper presents empirical research findings from China. Utilizing multi-source geographic big data and fieldwork, the team systematically deconstructs the source-sink dynamics of human trafficking, the global supply chains of wildlife trade, the network structures of illicit cultural heritage flow, and the diffusion paths of drug trafficking. The study validates the framework’s effectiveness in explaining the path evolution, network resilience, and border penetration mechanisms of illicit mobility, offering a novel geographical perspective and scientific basis for global border security governance.



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1872 - From Intention To Acquisition A Comprehensive Analysis Of Hukou Migration Among China's Floating Population

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This study examines the migration of household registration (hukou) among China's floating population, tracing the process from settlement intentions to actual hukou acquisition. Hukou refers to China's household registration system, which categorizes residents into rural and urban hukou and is closely linked to access to social welfare. Using multi-source data—including national survey statistics, Points of Interest (POI) data, and socioeconomic indicators—along with spatial analysis and geographical detector methods, we analyze the spatial patterns and drivers of migration intentions, actual hukou acquisition, and their disparities across 273 Chinese cities. The results show that: (1) Eastern regions and higher-tier cities dominate migration flows, with intra-regional migration intentions outweighing inter-regional ones. (2) There is a weak positive correlation between settlement intention and hukou acquisition. Cities such as Tianjin, Shenzhen, Chengdu, and Guangzhou display both high intention and high acquisition, whereas Beijing, Shanghai, Chongqing, and Yinchuan exhibit high intention but low acquisition. (3) Transportation infrastructure and residential availability are primary factors shaping settlement intention, while local hukou policies—serving as institutional thresholds—are the decisive factor influencing actual hukou acquisition and the main cause of the intention-acquisition gap. (4) Most cities face mismatches among migration intention, hukou acquisition, and registration policies, resulting in widespread scenarios of “willing but restricted” or “eligible but unwilling” settlement. We conclude with targeted policy recommendations to facilitate stratified settlement, promote equal access to public services, and advance hukou system reforms, thereby narrowing existing disparities and improving the quality of people-centered urbanization in China.



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C24.23-Health and Environment => Urban Ecology and Public Health: Redesigning Resilient Cities for Social Well-Being



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1336 - Geo Landscape And Poultry Avian Influenza In Europe Features And Implications

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Avian influenza is a zoonotic disease capable of cross-host transmission, which has significant impacts on human health, the poultry breeding industry, and ecosystem security. This study focuses on poultry avian influenza in European, using the XGBoost model to identify the main influencing factors of avian influenza in poultry, and explores the importance of environmental factors and their nonlinear effects. The results show that in the dominant areas of warm low-slope farmland in the south, precipitation, minimum temperature, and farmland fragmentation are important characteristics; in the dominant areas of cool plain farmland in the north, both human activities and climatic factors contribute significantly. In addition, there are significant interactions among precipitation, humidity, and temperature. The occurrence of highly pathogenic avian influenza in poultry is more favorable under environmental conditions with higher humidity and lower minimum temperature. In grassland-dominant areas, relatively concentrated farmland has greater transmission potential; while the interweaving of farmland and natural patches provides conditions for frequent contact between wild birds and poultry, increasing the risk of cross-host virus transmission. In summary, stable cold and humid environmental conditions are more conducive to the persistence and transmission of avian influenza in poultry, and the spatial structure of human activities and land use further amplifies the risk of the epidemic.



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1418 - Environmental Exposure Healthcare Accessibility And Maternal Health A Geospatial And Predictive Analysis Using Emr Data From Wuhan China

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This study investigates the complex relationships between environmental exposures, healthcare accessibility, and maternal health outcomes, leveraging electronic medical records from Wuhan, China. The first component, analyzing 311,972 pregnancies from 2014–2016 in Wuhan, identified a significant U-shaped association between ambient temperature and preterm birth risk, with critical thresholds below 14°C and above 20°C. This vulnerability was heightened in high-risk pregnancies and further compounded by exposure to PM_{2.5} and ozone. Spatial analysis pinpointed urban heat islands as key risk zones. Machine learning modeling, using XGBoost, effectively captured these nonlinear relationships, demonstrating the value of integrated predictive and spatial analytics in environmental epidemiology.

The second component, examining maternity care-seeking behavior among 24,105 women in 2016 in Wuhan, revealed a prominent “bypass-seeking” trend toward tertiary hospitals. This pattern was driven by socioeconomic factors, including higher income and education levels, and was influenced by a proximity threshold of 8–10 kilometers. Agent-based simulation modeling projected that ongoing urbanization would exacerbate these healthcare access disparities without targeted intervention. Collectively, the findings underscore the dual burden of climate-sensitive health risks and systemic healthcare inequities facing urban populations. This research advocates for evidence-based, data-driven policy in urban planning and healthcare resource allocation, contributing methodological advances in health geography and informing strategies for sustainable and equitable urban development.



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1757 - Exploring The Impacts Of Visual Characteristics In Protected Areas On Amusement And Awe Using Large Language Models A Cultural Ecosystem Service Perspective

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Protected areas are essential for promoting human well-being through the provision of cultural ecosystem services (CES). However, the assessment of CES remains challenging because of its intangible nature, particularly the recreational and spiritual dimensions closely linked to human health. This study addresses this gap by measuring amusement and awe as representatives of these two dimensions, using multimodal user-generated content (UGC).

The study followed a four-step workflow. We first collected and cleaned two years of text-image data from Sina Weibo for five national parks in China. Amusement and Awe were quantified using a large language model (LLM), natural language processing (NLP), and visual emotion analysis (VEA), while visual characteristics were extracted using computer vision techniques. XGBoost combined with SHAP was then applied to assess the importance and directional effects of visual characteristics. Finally, generalized additive models (GAMs) were used to examine nonlinear relationships between visual characteristics and Amusement and Awe, controlling for relevant covariates.

This study yielded three key findings. First, the relationships between Amusement and Awe differed across various analytical methods. Second, Brightness, Waterbody, and Greenness significantly predicted Amusement, with increasing, decreasing, and U-shaped relationships, respectively. Sky, Saturation, and Waterbody predicted Awe, showing increasing, inverted U-shaped, and mixed effects.

These findings support incorporating amusement and awe into multidimensional CES assessments. Methodologically, the study demonstrates the value of integrating AI-based approaches with multimodal UGC. Practically, the results point to opportunities in landscape design, health promotion, and policy to enhance recreational and spiritual experiences in protected areas, thereby supporting human well-being.



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C24.24-History of Geography => Histories of/Ideas in Geography for Peace



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1169 - Late Soviet Theoretical Geography And Its International Connections

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After Stalin's death in 1953, Soviet geography opened increasingly to international exchange. At Moscow State University, Yulian Saushkin (1911–1982)—known for wide international contacts, receptivity to new theory, and organizational skill—sought in the 1960s to establish theoretical/mathematical geography in step with Western developments. Among younger scholars, enthusiasm for modeling geographic processes acquired a distinctly anti-authoritarian inflection: the aim was to loosen geography's subordination to voluntarist, ideologically politicized planning and align it with “natural,” self-organizing spatial dynamics. The emphasis was placed on mathematical, cybernetic, bionic, and systemic methods. The circle was internationally visible, for example by presenting in 1967 a paper on metageography at the seventh congress of the Regional Science Association International.

Geographer Boris Rodoman (1931–2023) developed a distinctive visual language for Soviet theoretical geography—“geocartoids,” map-like diagrams. His models were closely attuned to the specificities of Russian space, including its problematic features, which he proposed to enhance for a shift to a different spatial and political regime. He identified the “internal periphery” as emblematic of Russia's totalitarian landscape, linking it to the polarization of society and geographic space. In his ‘Polarized Biosphere’—a utopian model envisioning city–nature symbiosis organized as two parallel networks—Rodoman advocated mobilizing the ecological potential of the internal periphery to effect a gradual, ‘organic’ reorientation of Russia's global specialization from the military-industrial complex toward ecological specialization.

Late-Soviet theoretical geography of the 1960s–1970s coalesced as a network of scholars who envisioned a quantitative–theoretical turn, developing both in dialogue with and in parallel to Western work. Engaged in international professional networks, they sought a global dialogue and reconceived geographic systems as self-organizing spatial processes, in contrast to the top-down, voluntarist, totalitarian planning of Stalinist geography. The paper traces these developments, examining late-Soviet theoretical geography—its aspirations, findings, internal contradictions, and unfulfilled promises—within the context of geographical internationalism and efforts to reorient Soviet geography toward less authoritarian models, shifting emphasis from the military-industrial complex to peaceful, self-organizing spatial processes.



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1193 - Geographies Of Pax Ottomanica Turbek (szigetvár) From Imperial Sacred City To Contemporary Peace Park

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This paper examines the long-term transformation of a contested imperial frontier into a contemporary landscape of reconciliation between Hungary and Turkey. In 1566, at the place where Sultan Süleyman I died during the siege of Szigetvár, the Ottomans created a pilgrimage centre inspired by Sufi concepts, around which a “holy city” emerged in the seventeenth century. Its role was to consolidate Ottoman rule along the western frontier of the Empire and to materialise an explicitly imperial, militarised and religious geopolitics of space. After the Habsburg reconquest of the area in 1689, the külliye and related buildings were not only demolished, but the very memory of their location was erased from local and national geographies.

Drawing on historical geography, archaeological research and memory studies, the paper traces how this forgotten site has recently been rediscovered and reframed. In the late twentieth century, Hungarian–Turkish initiatives led to the creation of a reconciliation park in 1994 to commemorate the 500th anniversary of Süleyman’s birth, though at a location later proven incorrect. In 2013–2016, systematic research led by geographers and archaeologists identified the actual location of the Ottoman memorial complex on a vineyard hill 4.2 kilometres from Szigetvár. The paper argues that this evolving landscape exemplifies how geographies of war and imperial domination can be reinterpreted as geographies of peace, dialogue and transnational cooperation. But whose peace?



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1303 - From Geographies Of Peace To Geographies Of Desertion Relevant Histories Of Geographies **Federico Ferretti ¹**

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Drawing upon a burgeoning international literature that fostered ideas of geographies and geopolitics ‘for peace’ in the last couple of decades, overthrowing well-known disciplinary commonplaces, and on current scholarship on anti-colonialism and decoloniality, this paper addresses early cases in radical geographies of peace to discuss what of this tradition can be found in attempts to support conscientious objection and the ‘refusal to fight’ in today conflicts. In the first part, I address the importance of the idea of desertion, represented by the classical symbol of the *crosse en l’air* (holding the rifle butt-up) since the 1871 Paris Commune in the trajectory of early anarchist geographers Elie and Elisée Reclus. While the idea of deserting the wars of capital was a classical feature in the creation of the international workers’ movement, the specific contribution of early anarchist geographers especially focused on pedagogies of peace, this latter understood not as the absence of formal conflicts, but as social justice. In the second part, I discuss how these traditions were refreshed in the years between 1950 and 1975 by the European ‘allies’ of anticolonial Afro-Asian movements who supported draftees refusing to fight in the colonial wars of the late French and Portuguese empires. Among them, Albert Camus famously claimed that ‘no cause justifies the death of innocent people’. In the third part, I provide few examples of how, today, movements inserted in this tradition try to support people refusing to fight in some of the most dramatic conflicts of the last few years eventually in Ukraine, Gaza and Sudan.



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1390 - Peace Oriented Proposals And Accompanying Events At The 1881 International Geographical Congress In Venice Towards A Geographical Peace

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Geography, as an intellectual endeavor concerned with describing and explaining the Earth and its constituent parts, has historically functioned both as an instrument of colonialism and imperialism and as a potential means of international cooperation and peace-building through cross-cultural understanding. The International Geographical Congress (IGC), inaugurated in 1871, and the subsequent establishment of the International Geographical Union (IGU) in 1922 can be understood as part of geographers' collective efforts to institutionalize peace through international understanding. This paper focuses on the Third IGC held in Venice in 1881 and examines both its pioneering aspirations and its inherent limitations in the construction of what may be termed "geographical peace." The choice of Venice—celebrated as the birthplace of Marco Polo and as the site where Vincenzo Coronelli founded the Accademia Cosmografica degli Argonauti in 1684, often regarded as the world's first geographical society—was symbolically significant. The congress was convened primarily at the Palazzo Ducale, and its opening ceremony was attended by King Umberto I of Italy and Queen Margherita. A total of 1,096 participants were officially registered, of whom 945 actually attended the congress; 348 participants came from outside Italy. Representatives from 27 countries were present, with Japan participating as the sole country from Asia. The congress was particularly notable for being the first to propose the creation of a "unione geografica universale," a global federation of geographical societies. It also adopted resolutions calling for the abolition of the slave trade and slavery in Egypt. Numerous accompanying events further characterized the congress, including a large-scale geographical exhibition held at the Palazzo Reale, illuminated nighttime festivities in Piazza San Marco, and regattas on the Canal Grande. At the same time, however, the congress remained deeply entangled with imperial logics. National geographical societies were requested to compile lists of ongoing exploratory activities, and posters for Verdi's *Aida*, performed seven times during the congress and stuffed with exoticized imagery of Egypt, reveal how colonialism and Orientalism continued to permeate the cultural and intellectual atmosphere of the event.



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1539 - Reimagining Space Italian Critical Geography And Geopolitics For Peace

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In recent decades, peace geography and critical geopolitics have challenged the traditional association of geography with power. They argue that the discipline should move beyond explaining organised violence, instead interrogating the conditions through which geographical knowledge can support non-violence and peace-building practices. This contribution engages with peaceful geopolitics by challenging the war/peace dichotomy and the realist assumptions which portray conflict as inevitable. While geography has historically supported imperial and militaristic projects, the basic hypothesis is that it has also produced critical and counter-hegemonic traditions, genuine political actions capable of articulating a radical critique of geopolitical violence and imagining new spatial orders. This contribution provides a chronological overview of critical geographical thought in Italy from the late nineteenth century to the present day. Through analysing the works of Ghisleri, Maranelli (in dialogue with Salvemini) and Gambi, it demonstrates how these authors contributed to the development of peace-oriented political geography.

Methodologically, the research adopts geographical and historical critical approaches, based on textual and contextual analyses of geopolitical, political and popular writings. These are considered historical documents, as well as discursive and political practices of counter-geopolitics.

The results reveal Ghisleri's connection of pacifism, anti-colonialism, and geographical dissemination, and demonstrate the innovative anti-imperialist and anti-fascist spatial policy developed by Maranelli and Salvemini during the fascist era. This policy pitted regional cooperation and self-determination against the aggressive use of geopolitics. The results also show how Gambi incorporated this criticism into academic debate. These authors develop conceptions of peace that cannot be reduced to 'negative peace', but which are oriented towards social transformation and the prevention of conflict.

In conclusion, this study presents these experiences as an Italian genealogy of geographies and geopolitics for peace. The research highlights conditions for a critical geography capable of envisioning peaceful spatial orders and guiding contemporary efforts in conflict prevention.



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1944 - Geography Between Tradition And Contemporary Approaches Evidence From The Congresses Of Slavic Geographers And Ethnographers (1924–2024)

Milena Panić ¹, Stefan Denda ², Milan Radovanović ³

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Background:

In the territory of the former Yugoslavia, geography began to develop as a scientific discipline in the late nineteenth century. Its institutional and methodological consolidation was hindered by numerous historical and political circumstances, most notably the First World War. Following this period, a new phase of development emerged, marked by the gradual establishment of geography in both educational and scientific contexts.

Materials and Methods:

A comprehensive insight into the long-term evolution of geography and geographical thought, methods, and approaches in the Kingdom of Yugoslavia is obtained through a comparative analysis of the thematic scope and scientific contributions presented at the Congresses of Slavic Geographers and Ethnographers held between 1924 and 2024. In total, five congresses are examined as key milestones reflecting disciplinary transformations.

Results:

The First Congress (1924) revealed the dominance of physical geography and ethnography, while economic and political themes were marginal. Methodological frameworks were primarily descriptive and regionally oriented. At the Second Congress (1927), a broader thematic and disciplinary spectrum emerged, with increased attention to social, demographic, and regional issues. A major qualitative shift occurred at the Third Congress (1930), characterized by the strong prominence of anthropogeographical and social topics, methodological distancing from descriptive geography, and an intensified integration of natural and social factors. The Fourth Congress (1936) did not introduce radical thematic innovations but confirmed already established disciplines and research directions. Contemporary geography, as reflected at the Fifth Congress (2024), is characterized by a pronounced problem-oriented approach, a high degree of interdisciplinarity, and the extensive application of advanced methodological tools.

Conclusion:

Continuity with earlier traditions is evident in historical-geographical and anthropogeographical studies, particularly those inspired by the scientific legacy of Jovan Cvijić. These classical approaches have been critically reassessed and successfully integrated into contemporary theoretical and methodological frameworks.



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2531 - The Military And Japanese Society □koji Iizuka's Comparative Civilization Approach
Akio Onjo¹

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Koji Iizuka (1906–1970) was one of the leading human geographers in Japan in the period following the Second World War. After specializing in economic history, he developed a deep interest in human geography and studied in France. Iizuka remained an outsider within Japanese academic geography, and during the wartime period he was critical of German geopolitics. This paper examines his critical reflections, published after the Second World War, on the spiritual-historical “milieu” of Japanese society and culture by reconsidering Japanese military organization. The introduction of Western civilization into Japan gave deep contradictions. They have always been fundamental issues in Japanese humanities and social sciences. For example, since the Meiji Restoration, the ambiguity and instability of the Japanese perceptions of Asia or the Japan's position in Asia had been discussed by intellectuals. Rather than treating the military organization as a ‘small world’ separate from society at large, Iizuka considered that the military itself was a site in which these contradictions of modern Japanese culture and society were manifested intensively. He tried to reveal the traditional mental structures and social relations of the Japanese people in the European-style modern military system. He further insisted on the necessity of the self-transformation or revolution of the inner world of ordinary people that had been in accordance with patriarchal social relations and regarded themselves only as victims, not as aggressors of the War. Although there are limits to his Enlightenment-oriented perspective, Iizuka's endeavor might be a kind of critical lens through which to examine the contemporary world, in which nationalism and the cycle of tragic violence is more and more worsening.



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3169 - Feminist Histories Of Geographical Thought For Peace

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This contribution addresses the histories of geographical thought for peace by foregrounding feminist, queer, and anti-statist traditions that have historically challenged the militarist, statist, and colonial foundations of modern geography. While critical scholarship has extensively examined geography's entanglement with warfare, empire, and state power, less attention has been paid to counter-histories that mobilised geographical knowledge in the service of anti-militarism, internationalism, and non-statist social transformation.

Adopting a historical and genealogical approach, the presentation revisits pacifist and anti-militarist geographical imaginaries ranging from Zonia Baber's educational and environmental work within early twentieth-century peace movements, including the Women's International League for Peace and Freedom, to Emma Goldman's critique of borders, nationalism, and war, grounded in non-violence and individual autonomy. It then turns to Ursula K. Le Guin's *The Dispossessed*, read as a form of feminist and anti-statist counter-geopolitics in which speculative and geopoetic narratives function as epistemic interventions that unsettle statist, territorial, and militarised spatial orders.

By engaging geopoetics and speculative geography as historical sources of spatial thought, the presentation treats imaginative narratives not as illustrations but as integral components of geographical critique. Taken together, these counter-histories suggest that geography's capacity to contribute to peace has historically depended on its willingness to detach its spatial concepts from state power and to cultivate, in Kropotkin's terms, "feelings more worthy of humanity".



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**C24.25-Informality, Social Change and Development
=> Urban socio-spatial restructuring and governance in
the era of globalization**



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1206 - Anchoring The Drift” A Research On The Transverse Agency Of The Digitalnomad Community In Dali China

Bowei Cai ¹, Gengzhi Huang ¹

Sun Yat-sen University, School Of Geography And Planning, Guangzhou-China ¹

With the rise of the gig economy and the ubiquity of digital technologies, “digital nomads”—remote workers who have transcended traditional geographical constraints—have emerged as a global phenomenon. Characterized by a mobile lifestyle integrating work and travel, they paradoxically exhibit large-scale spatial agglomeration in specific locales, such as Dali, China. Addressing the paradox of “theoretical location independence versus actual spatial agglomeration,” this study moves beyond the traditional perspective of tourism consumption, which often views nomads as mere transient consumers. Instead, it positions digital nomadism within the framework of Labor Geography, framing the phenomenon as a deliberate survival strategy to navigate the heightened uncertainties inherent in the gig economy.

We propose the concept of “Weak-tie Transverse Agency” to explain how these atomized workers rebuild collective power outside traditional workplace hierarchies. Utilizing Dali, China, as an empirical case study, we conducted in-depth interviews and participant observations within the local nomad community. Findings indicate that Dali’s inclusive social atmosphere and its unique spatial configuration—characterized by high-density “third place” for spontaneous connectivity. This spatial affordance enables digital nomads to construct highly heterogeneous weak-tie networks that bridge diverse professional backgrounds.

By leveraging these transverse relationships, workers facilitate the efficient flow of tacit knowledge, engage in reciprocal upskilling, and construct place-based collective identities. These horizontal interactions allow nomads to bypass the isolation of platform-mediated labor, transforming loose social relations into a “fluid safety net” against systemic uncertainty. This research reveals the sophisticated mechanism of labor agency underlying spatial agglomeration, suggesting that digital nomads are not just “drifting” but are actively re-rooting in specific places to secure their socio-economic resilience in the gig economy.



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1207 - The Location And Local Impact Of Data Centers

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Against the backdrop of the AI era, data centers have evolved into critical digital infrastructure, exerting profound impacts on urban socio-spatial patterns amid globalization. From an economic geography perspective, this study redefines data centers as socio-ecological entities rather than merely technical facilities, and explores three core issues: their essential connotations, the key drivers of their uneven global and local distribution, and the paradox of their local impacts. The research identifies five critical location determinants: Connectivity, Power, Land, Climate, and Policy. Specifically, data centers tend to cluster near urban cores and key internet hubs to ensure low latency, while being pushed to suburban or remote areas due to cost pressures (land, power) and policy guidance (e.g., China's "East Data, West Computing" Initiative). This spatial pattern reshapes the traditional urban core-periphery structure, forming new digital divides. Regarding local impacts, there exists a prominent paradox: while data centers are expected to boost local employment, investment, and tax revenues, actual economic spillovers are limited (only 30% of investment stays local), whereas local communities bear substantial burdens including environmental pollution, excessive energy and water consumption, and land use transformation. The study concludes that data center location decisions are the outcome of a tug-of-war between market demands, cost factors, and policy interventions, and their global infrastructure attributes and local impact characteristics call for a geography-based governance framework integrating impact assessment, community engagement, and innovative regulation. This framework is crucial for reconciling global digital development needs with local well-being, and provides insights for urban socio-spatial restructuring and governance in the globalization era.



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1221 - Composting Chinese Cities Urban Laboratories Grassroots Alternatives And Politics Of Food Waste In Contemporary China

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This research examines the shifting paradigm of urban waste governance in China through the lens of grassroots community composting initiatives, with particular focus on bottom-up governance models exemplified by the Nanjing University (Lishui) Institute for Eco-Environmental Sciences and the China Community Composting Network. China's waste governance trajectory has undergone dramatic transformations: from the "waste besiegement" crisis of the 2010s to the excessive construction of incineration infrastructure in the 2020s, and subsequently to mandatory waste sorting policies implemented after 2017. First-tier cities such as Shanghai invested substantial financial resources attempting to separate food waste from the waste stream. However, due to insufficient terminal food waste processing facilities and prohibitively high costs, the Ministry of Housing and Urban-Rural Development has gradually abandoned performance assessments based on food waste separation rates. Against this backdrop of state-led governance challenges, grassroots platforms represented by the Nanjing University (Lishui) Institute for Eco-Environmental Sciences have emerged as critical actors in alternative waste governance. Through multi-scalar collaboration with various levels of government, these civil society organizations have transformed community composting from experimental projects into viable urban laboratories for sustainable waste management. Despite confronting numerous operational obstacles—including institutional barriers, resource constraints, and technological adaptation challenges—these bottom-up initiatives demonstrate the potential of alternative governance modalities that complement and contest dominant incineration-centered approaches. This case reveals how community-based composting networks function as sites of socio-technical innovation, generating localized knowledge, fostering civic environmental consciousness, and reconfiguring state-society relations in China's waste governance landscape. The research contributes to urban governance scholarship by illuminating how grassroots experimentation creates spaces for alternative pathways toward circular economy transitions, offering both practical hope and theoretical insights into polycentric environmental governance in authoritarian contexts.



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1233 - Spatial Differentiation Patterns Of Environmental Inequality In The Urban Spatial Restructuring Process A Case Study Of Shanghai Guangzhou And Chengdu

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The spatial restructuring of large Chinese cities has exacerbated internal spatial differentiation and social segregation, resulting in disparities in the distribution of environmental risks across social groups and regions. This has negatively impacted the health and well-being of urban residents. This study analyzes the socio-spatial disparities in environmental risk distribution in Shanghai, Guangzhou, and Chengdu using pollution discharge permit data and census data, with ArcGIS spatial analysis methods. Principal component analysis is then applied for dimensionality reduction to capture the characteristics of urban spatial restructuring. Interaction term models are applied to analyze the intrinsic connections between environmental inequality and the urban spatial restructuring process. The findings reveal that individuals with lower education levels and migrant populations are exposed to greater environmental risks, with environmental inequality increasing from the city center to the periphery. The spatial variations in environmental inequality across the three cities can be attributed to their respective urban spatial restructuring processes and development trajectories, resulting in three distinct patterns of environmental inequality: minimal impact, localized improvement, and environmental deprivation. The study draws on Spatial Production Theory and Rawls' Theory of Justice to elucidate the evolution of environmental inequality in spatial differentiation within the context of urban spatial restructuring, emphasizing the shift from capital-driven spatial production to government-led social justice practices. It is suggested that when formulating and implementing strategies to promote environmental justice and sustainable urban development, the global and dynamic nature of urban space development should be considered to ensure equitable sharing of environmental benefits across all regions and social groups.



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1251 - Community Scale Drivers Of Urban Dengue Risk Climate Change Socio Spatial Inequality And Community Resilience In Guangzhou China

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With the impacts of climate change and rapid urbanization, dengue fever has become a major public health challenge in Chinese cities. Although climatic conditions, urban environments, and population structures are widely recognized as key drivers of dengue transmission, existing research has paid limited attention to how these factors interact at the urban community scale, or how they are coupled with internal community social conditions to generate differentiated patterns of dengue risk. Drawing on a community resilience framework, this study employs empirical analysis to examine the systemic driving mechanisms of dengue risk at the urban community level in China, together with related governance practices.

Using Guangzhou as a case study, the research adopts perspectives from social and health geography to analyze the spatiotemporal differentiation of dengue risk across urban communities. It focuses on the interactions between structural risk factors and community-level factors, including socioeconomic conditions, organizational capacity, and degrees of embeddedness in local governance structures, in order to answer why do communities exposed to highly similar structural risk conditions experience markedly different patterns of dengue outbreaks and transmission?

The findings suggest that dengue risk is not linearly determined by isolated environmental or social factors, but instead emerges from a complex risk system shaped by the interaction of multiple drivers at the community scale. Within this system, community resilience operates as a critical mediating mechanism. Through everyday environmental management practices, social networks and mutual support, collective action capacities, and engagement with grassroots governance arrangements, community resilience substantially influences how risk exposure is translated into health outcomes. While poverty and marginalization intensify structural vulnerability, they do not inevitably lead to higher dengue risk. Community-level capacities for organization, knowledge sharing, and adaptation can partially buffer structural disadvantages, producing uneven health outcomes even among similarly marginalized communities.

By conceptualizing dengue fever as a potential “disease of poverty” embedded in socio-spatial inequality, this study advances an integrated analytical framework linking climatic and environmental risks, community social factors, and community resilience. It offers empirical insights into community-based dengue governance and contributes to debates on urban health and climate justice under conditions of rapid urban and environmental change.



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1439 - Domestic Informal Tourism Mobilities And Urban Socio Spatial Restructuring In Harare Zimbabwe.

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Abstract

Background: Across the African continent, informality and mobility are key drivers of the urban change, though they are inefficiently integrated into socio-spatial restructuring and governance conversations. This study centers in Zimbabwe and examines the extent to which domestic informal tourism mobilities from small towns and villages influence the reconfiguration of urban space in Harare, the country's capital. Instead of treating informal business tourism through a sectoral tourism lens, this study reframes these mobilities as part of daily urban informal traffic that reshapes 'city-town' relations. **Materials and Methods:** The study adopts a two-fold analytical framework: (1) First, it employs a desktop analysis to position Harare within Zimbabwe's urban hierarchy, articulating the functional interrelationships between small towns and a major city. Small towns emerge largely as areas of origin for domestic informal tourism operators whose periodic mobility to Harare is triggered by, inter alia, access to markets and social entrepreneurship, survival prospects and transport connectivity. (2) Second, drawing from empirical data obtained through a survey of (n = 400) domestic informal tourism operators visiting Harare, the study examines their spatial practices, encompassing their movement routes, temporal zones of residence in the city, trading locations and contact with urban regulatory systems.

Results: The study findings illuminate new socio-spatial configurations within Harare that are revealed through domestic informal tourism mobilities. These included commercial corridors, informal accommodation spaces, social patterns, transport infrastructure and urban regulatory frameworks. These mobilities challenge the formal urban management frameworks and expose urban governance omissions of the informality presence, typical of Africa, particularly regarding exclusion, policy and the right to urban space. **Conclusions:** The activities of informal mobilities from small towns to major cities in Africa are not peripheral to urban development but are significant drivers of urban restructuring. This study is of the notion that domestic informal tourism is a spatial and governance concept that is critical for understanding contemporary African urbanism. Through integrating informality and mobility within an urban discourse, this study contributes to broader conversations on urban restructuring, social change and comprehensive governance in African cities in the era of globalization.



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1557 - Socio Spatial Restructuring In Europe Comparing Area Based Urban Governance In Denmark And Serbia

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European cities are increasingly utilizing area-based initiatives as instruments of urban governance to address socio-spatial inequality, housing exclusion, and perceived urban disorder. Although often framed as place-based and socially integrative, these interventions are shaped by particular governance rationalities and symbolic representations of marginalized urban spaces. This study employs comparative research from the Marie Skłodowska-Curie Actions Staff Exchange project Deliver sAfe and Social Housing (DASH) to analyze how area-based initiatives function as mechanisms of socio-spatial restructuring.

The first case examines Denmark’s Parallel Society Act, which establishes a highly centralized model of urban governance. Legally codified spatial classifications and demographic thresholds are used to designate certain residential areas as exceptional spaces requiring intervention. This framework generates state-sponsored territorial stigmatization, legitimizing coercive measures such as tenure transformation, demolition, and resident displacement. Space thus becomes a key governance technology for regulating populations and redefining the boundaries of urban citizenship.

The second case investigates area-based initiatives aimed at upgrading Roma settlements in Serbia, within a governance context marked by fragmented institutional responsibilities, dependence on international donors, and project-based implementation. In this setting, territorial stigmatization arises from persistent socio-ethnic marginalization and the informal status of settlements, rather than from formalized spatial labeling. Upgrading initiatives prioritize infrastructure provision, housing improvement, and legal regularization, yet their effectiveness is limited by weak institutional integration and insufficient alignment with national housing and welfare systems.

A comparison of these two cases demonstrates that area-based initiatives are not neutral policy instruments but serve as central arenas where governance, stigma, and spatial restructuring converge. Both punitive and inclusion-oriented models risk reproducing inequality when spatial interventions are detached from broader structural reforms. This study contributes to debates on urban governance by illustrating how territorial stigmatization is actively produced, negotiated, and contested through area-based policies across varied political and institutional contexts.

The author acknowledges funding from the Marie Skłodowska-Curie Actions of the European Union’s Horizon Europe (ID 101086488), and the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, through institutional financing of the Geographical Institute, “Jovan Cvijić” SASA (Contract 451-03-136/2025-03/200172)



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1851 - Housing Pathway And Property Minds Of Immigrants A Case Study Of Chinese Immigrants Residing In Helsinki Metropolitan Area

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Housing opportunities for immigrants and other vulnerable groups are increasingly constrained by housing market reforms, declining affordability, and the retrenchment of social housing, even within Nordic welfare states traditionally committed to housing as a basic social right. While existing research has examined immigrants' housing conditions in host societies, it often relies on cross-sectional perspectives and overlooks the influence of prior housing experiences, subjective perceptions, and transnational housing contexts. Addressing these gaps, this study examines the housing pathways of Chinese immigrants residing in the Helsinki Metropolitan Area (HMA) within the context of Finland's transforming housing market. Drawing on Bourdieu's theory different forms of capital and a political economy perspective, the study analyzes how economic, cultural, and social capital, institutional incentives and constraints, and culturally embedded attitudes toward homeownership interact to shape housing realities, perceptions, and future settlement plans. Special attention is paid to immigrants' active role in forming their property minds (or financialized subjectivities), challenging portrayals of immigrants as passive actors in housing markets. By situating immigrants' housing pathways within both host society and home country transformations, particularly China's rapid housing market development, this research provides a cross-temporal and transnational perspective on immigrant housing. The study contributes empirically and theoretically to debates on housing, migration, and welfare-state transformation, highlighting the significance of homeownership in shaping long-term settlement decisions among Chinese immigrants in the HMA.



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2024 - The Evolution Of Japan's "all You Can Drink" Services In Cities Alcohol Consumption And The Future Of The Post Covid 19 Nighttime Economy

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This paper critically examines the evolution of nomihodai (all-you-can-drink) services in Japanese nightscapes. Since the 1990s, the landscape of Japan's nighttime economy has been profoundly transformed by the proliferation of "all-you-can-drink" services. Pioneered by major izakaya chains, this business model emerged as a strategic response to shifting consumer preferences. Its unparalleled cost-performance and predictable pricing structure garnered widespread customer support. Its widespread adoption has formed a major segment within the food and beverage industry.

Meanwhile, heightened public health awareness has spurred significant discussions and actions from government agencies and medical institutions. The Ministry of Health, Labour and Welfare, collaborating with medical experts, actively advocates for a re-evaluation of national drinking habits. "Guidelines for Healthy Drinking," which was released in 2024 as part of this effort, represents a crucial initiative to provide a universal framework for responsible alcohol consumption. However, questions remain about the effectiveness of such broad guidelines. Factors like individual alcohol tolerance, age, socioeconomic status, and regional cultural norms significantly influence drinking behavior. This means that a one-size-fits-all approach may have limited impact on diverse groups.

As Japan navigates the complex aftermath of the COVID-19 pandemic, challenges surrounding social issues and public health remain significant. Japan faces a delicate balancing act. On one hand, it must meet the economic demands of restaurants and beverage manufacturers with the need to revitalize the nighttime economy. On the other hand, it also must simultaneously advance public health while respecting the social right to gather and celebrate. Within this context, "all-you-can-drink" services are also evolving in diverse ways, varying in usage time, pricing, and menu selection. This complex interplay of economic interests, public welfare, and cultural practices continues to shape Japan's unique drinking culture, posing ongoing questions about sustainability and adaptation in the post-pandemic era.



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3269 - Globalisation Urban Spatial Restructuring And Gentrification Case Of Indian Cities

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Urban spatial restructuring to link globally for business, international events such as sporting events, political such as G-20, and so on, and cultural tourism, is causing cities to undertake urban renewal projects. With lack of financial resources of the cities, land-based financing has emerged as the key instrument of urban renewal. This has created an approach, which is expropriating lands under informal uses, such as slum locations and informal markets. Thus, market and state led gentrification is underway in the cities, in particularly of the Global South. Taking example of Indian cities, we propose to illustrate as to how state and market have caused gentrification and by that ejecting informal housing and economic activities from the main parts of the city and peripheralising these, increasing marginalities and inequalities. The urban policies, planning, financing, governance structures, elite capture of urban decision-making, and above all democratic back sliding have resulted in a situation gentrification, peripheralization, and marginalisation. The implications are not just on urban equity and poverty reduction, but also on public health, and climate change adaptation and mitigation, in short on sustainable urban development. The paper in particular will focus on housing and its provisioning in this new era of globalisation.



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**C24.26-International Geography Olympiad
Commission => Global Differences and Challenges in
Geography Teaching and Education Through National
and International Geography Olympiads**



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2134 - 30 Years Of The International Geography Olympiad A Retrospective

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The International Geography Olympiad (iGeo) is an annual competition for young geographers aged 16 to 19, selected based on their results in national geography competitions. iGeo is held under the auspices of the International Geographical Union (IGU), and its organisation is supervised by the IGU Olympiad Steering Committee.

In 2026, iGeo will celebrate its 30th anniversary, and this presentation aims to provide a retrospective of the competition, specifically addressing changes and challenges within the event itself.

The idea of organising an international competition in geographical knowledge and skills emerged in 1994 during the IGU Congress in Prague, initiated by geographers from Poland and the Netherlands. The first International Geography Olympiad was held in 1996 in The Hague, Netherlands, and was attended by high school students from five European countries: Belgium, the Netherlands, Germany, Poland, and Slovenia. Since then, it has grown significantly, reaching up to 47 teams in 2025. The Geography Olympiad expanded beyond Europe in 2000, when the third competition was held in Seoul. In addition to the host, South Korea, several European countries were joined by China (China-Beijing), Japan, and the Republic of South Africa. Prior to 2012, the International Geography Olympiads were held every two years, but since then, iGeo has become an annual event.



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2544 - Inclusive Approach In The Implementation Of The National Geography Exam In Croatia

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The national Geography exam assesses geographical knowledge and geographical skills acquired by eighth-grade students during their previous primary education. An inclusive approach is applied in the assessment, meaning that students with learning difficulties also take the exams.

The aim of this paper is to analyse the results of the national Geography exam of eighth-grade students educated according to the regular programme with content adaptation and individualized procedures, and to present the results by gender as well as by assessment concepts and thematic units. The analysis was conducted on a sample of 1,333 eighth-grade students who took the national exam in the 2024/2025 school year. Quantitative methods (descriptive statistics and tests of statistical significance of differences) and qualitative methods were applied.

The results showed that students achieved the highest average scores in the concept of Spatial Identity (51.7%) and the lowest average scores in the concept of Spatial Organization and Processes (44.1%), with no statistically significant differences in achievement by gender. The overall average exam success rate was 46.5%, while the average success rate for the third assessment concept, Sustainability, was 49.3%. When analysed by thematic units, the average results from highest to lowest were as follows: Geographical Maps (68.5%), Economy (57.5%), Population (39.7%), Relief (33.4%), and Climate (27.8%). Girls achieved statistically significantly different results compared to boys in the thematic unit Geographical Maps, while boys achieved statistically significantly different results in the thematic unit Climate. In the remaining thematic units, no statistically significant gender differences were found.

The paper also identifies the educational outcomes related to those exam tasks in which students achieved the lowest results, that is, the content areas that require improvement in teaching and learning in order to achieve better results in future research.



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C24.27-Islands => Fluid Sovereignties: Geopolitics, Climate Change, and the Future of Island and Maritime Spaces



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1269 - Residual Sovereignty Maritime Geopolitics And Island Self Determination The Case Of Okinawa Japan

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‘Residual sovereignty’ was coined in 1951 by John Foster Dulles, then a special advisor to President Truman and the primary architect of the Treaty of San Francisco. At the San Francisco Peace Conference, while emphasizing the postwar restoration of Japan’s full sovereignty, Dulles explained why and how Article 3 of the Treaty provided for the detachment of Okinawa and other southern islands from Japan and their future placement under U.S. trusteeship. He used the term ‘residual sovereignty’ to describe the legal temporality and ambiguity of the islands over which Japan still retained some degree of sovereignty. The U.S., leading the Conference and the Western Bloc, tactically divided the notion of sovereignty into administrative rights and residual sovereignty, with the former granted to the U.S. This division produced two results: first, it enabled the U.S. to freely utilize the islands for its strategic objectives, leading to the militarization of Okinawa as its offshore military outpost even after Okinawa reverted to Japan in 1972; second, it has caused territorial disputes since the end of U.S. administration over these islands, leading to potential and present tensions between Japan and neighboring states. The presentation, using government and other historical materials, illustrates how the notion of divisible sovereignty can render island territories subject to the manipulation of hegemonic states for their maritime geopolitics or containment policy, and how it has led to gradual shifts in the politicized identity formation of islanders seeking self-determination through collective action. The presentation concludes that the maritime geopolitics of hegemonic states have intersected over the islands and seas around them, due in part to the ambiguity surrounding their sovereignty.



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1356 - From Military Defense To Ecological Containment Nonhuman Invasion And Intertidal (re) bordering On The Kinmen Islands

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Located only a few kilometers off the coast of southeastern China, Taiwan's offshore islands of Kinmen historically served as a military frontline against the People's Republic of China. This history has constituted Kinmen as a border island and its coastlines as a militarized border zone, where remaining anti-landing structures serve as reminders of its past defense against 'communist invasion'. In recent decades, however, the coastlines of Kinmen have been confronted with a different kind of 'invasion' – a nonhuman one. Smooth cordgrass (*Spartina alterniflora*), a nonnative plant, has emerged as a threat to Kinmen's coastal biodiversity and an agent reshaping coastal landscapes. It drives the terrestrialization of intertidal zones, transforming tidal flats into land and undermining the habitats of coastal wildlife.

Unlike territorial defense, containing the cordgrass 'invasion' requires different governing logics. Smooth cordgrass seeds can travel long distances via ocean currents, and once settled on a coastline, they proliferate rapidly through underground rhizomes, forming dense patches that exclude other species. Its containment thus requires continual intervention and adjustment rather than territorial fortification, suggesting a form of border governance distinct from that of humans. By examining the border-crossing movement of smooth cordgrass and the different governing logics in intertidal zones, this paper rethinks intertidal bordering and containment processes on the Kinmen Islands.



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1430 - Multi Level Governance And Agricultural Resilience In Taiwan's Island Economy

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Background/Hypothesis

In the twenty-first century, island and maritime spaces are increasingly shaped by geopolitical shocks that extend beyond conventional territorial and maritime boundaries. While political geography has extensively examined sovereignty in relation to security and borders, the impacts of geopolitical disruptions on agricultural governance and rural livelihoods remain underexplored. This paper hypothesizes that external geopolitical shocks reconfigure sovereignty in island economies in fluid and uneven ways, particularly through multi-level governance structures that mediate policy responses and resilience outcomes.

Materials and Methods

The study adopts a mixed-methods approach combining longitudinal agricultural and trade statistics (2017–2025), spatial analysis of production regions and agricultural infrastructure, and qualitative interviews with farmers, cooperatives, traders, and government officials. Empirically, it focuses on China's suspension of imports of Taiwanese agricultural products since 2021, with particular attention to major wax apple-producing areas in southern Taiwan.

Results

The findings show that trade embargoes function as geopolitical shocks that penetrate deeply into domestic agricultural systems. Sovereignty under geopolitical pressure becomes redistributed across international trade regimes, national policy frameworks, local governments, agricultural organizations, and farmers. Although central and local authorities deploy policy instruments such as export diversification, subsidies, cold-chain infrastructure, and branding strategies, access to agricultural resilience is uneven, shaped by farmers' resource endowments, market connections, and institutional proximity.

Conclusions

By conceptualizing agriculture as an internal frontline of geopolitical contestation, this paper extends debates on fluid sovereignty beyond maritime borders. It demonstrates how global power struggles are enacted through everyday governance practices and resilience-making processes within island economies, contributing to island studies and political geography.



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1648 - Progress And Prospects In Maritime Political Geography

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For an extended period, research on maritime political geography remained scarce under the dominance of terracentrism in political geography. Moreover, the field of maritime political geography has yet to establish a unified research paradigm and make theoretical dialogues between Chinese and Western scholarship. To address these gaps, this paper conducts a bibliometric analysis and systematic reading of 369 English-language articles from 14 international journals and 156 Chinese-language articles from CNKI up to May 2025. Based on this, it identifies and synthesizes six core research themes: marine ontology, sea power and geopolitical strategy, territorial disputes and maritime delimitation practices, migration and border control at sea, political ecology and marine environmental protection, and marine governance and spatial planning. Region-focused studies reveal significant divergences among the “three oceans and two seas”: the Pacific prioritizes military strategy, the Atlantic emphasizes economic collaboration, the Arctic Ocean highlights techno-political issues, the Mediterranean centers on migration governance, while the South China Sea concentrates on sovereignty disputes. Grounded in the core principles of political geography, this study defines maritime political geography as a subfield of political geography that examines the interaction between political activities (or power relations) and maritime spaces. Its core research objects encompass the spatial patterns of marine political power, alongside political geographical issues concerning marine resource allocation, maritime border delimitation, and geopolitical strategic competition. Drawing on key concepts in political geography such as territoriality, scale, and governmentality, the paper further develops a conceptual framework for analyzing maritime political geographical phenomena and processes, centered on the themes of “resources-delimitation-strategy” and the interactions between power and maritime ontology. It then outlines the future research directions for maritime political geography in China, including theoretical innovation and disciplinary development, thematic expansion, and the broadening of geographical coverage. The main contribution of this study lies in systematically proposing, for the first time, a research framework and a prospective research agenda for maritime political geography grounded in the foundational insights of political geography. It provides a basis for future scholarly dialogue and expansion in this emerging field, while also enriching the discipline of political geography and enhancing its theoretical explanatory power.



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1656 - Territory Vs. Network The Geopolitics Of Submarine Cables

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This paper examines how submarine cables, as the material infrastructure of global data circulation, are reshaping sovereignty, boundaries, and security in island and maritime spaces. Rather than being neutral technical conduits, submarine cables are deeply embedded in state power, geopolitical rivalry, and security discourses, embodying a spatial logic in which territoriality and networked connectivity coexist.

On the one hand, through the siting of landing stations, access permissions, ownership arrangements, and regulatory regimes, submarine cables are increasingly incorporated into national governance frameworks and transformed into exclusive communication territories. In islands, straits, and key maritime corridors, cable infrastructures intersect with territorial control, border-making, and security practices, turning these spaces into renewed frontiers of geopolitical contestation.

On the other hand, the transnational networks constituted by submarine cables continuously challenge conventional, territory-centered spatial imaginaries. The involvement of multiple actors, nodal spatial configurations, and emerging governance logics centered on cybersecurity weaken the notion of absolute state control while simultaneously reconstituting sovereignty in new forms. Island and nearshore spaces thus become critical interfaces linking global data flows with state authority.

Drawing on the perspective of “fluid sovereignty”, this paper demonstrates how submarine cables transform islands and seas into key geopolitical arenas in the digital age, offering a political geographic framework for understanding the evolving interplay between infrastructure, sovereignty, and networked space.



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2043 - Seas Of Sovereignty Changing Defended Territories And Island Identities In The Kinmen And Matsu Archipelagos

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Islands often emerge as critical sites where geopolitical tensions, environmental vulnerabilities, and cultural identities converge. These dynamics are especially pronounced on islands located within historically contested maritime regions, such as the Kinmen and Matsu archipelagos, which lie in the coastal waters off southern and northern Fujian Province, China. This paper examines how sovereignty, territoriality, and island identity have been continuously reconfigured on these two archipelagos from the fourteenth century to the present.

Evidence of shifting defended territories and evolving island identities is embedded in island landscapes, including ancient forts, coastal defense structures, underground tunnel systems, fortified villages, historical maps, archival records, and local rituals. Changes in East Asian maritime geopolitics repeatedly altered the orientation and function of island defenses, leaving layered fortifications that have become integral elements of the archipelagic landscape. Islander mobility was likewise shaped by cycles of warfare, trade, and connections to nearby ports, while returning migrants introduced new social, economic, and cultural influences.

In modern history, particularly after 1949, both archipelagos were heavily militarized under the War Zone Administration Committee (WZAC) until 1992, when cross-Taiwan Strait tensions temporarily eased. During this period of détente, Kinmen and Matsu assumed new roles as sites of reconnection, serving as symbolic and practical bridges of peace through direct ferry links between Taiwan (ROC) and mainland China (PRC).

This study argues that islanders have not simply been passive or vulnerable subjects within contested seas of sovereignty. Instead, they have demonstrated resilience by maintaining strong attachments to their home islands while expanding their mobility across wider regional networks. Through adaptation, return migration, and the reworking of militarized landscapes, island communities have actively reshaped their identities and strengthened their capacity for resilience and development amid ongoing geopolitical uncertainty.



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C24.28-Karst => Advance Karst Science and Sustainable Karst Managment



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1570 - Toponymy Of The Karst Landscape Based On Hydromorphological Characteristics Of The Gunungsewu Karst Area Giritontro District Central Java.

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This study examines toponymy in the karst landscape of Giritontro District, Wonogiri Regency, Central Java, and explains how place naming practices mirror the geographical setting, environmental processes, and socio-cultural history of the local community. The research is situated in the Gunungsewu karst system, where approximately 98% of the district is composed of karst hills and depressions spread across five villages and two urban wards. Using a qualitative descriptive design, the study combines interpretation of topographic maps and Ikonos satellite imagery with detailed field observations and in-depth interviews conducted through snowball sampling with local key informants. The dataset comprises 83 karst-related toponyms, including 18 hydronyms and 65 names associated with geomorphological units such as hills, domes, dolines, caves, and alluvial plains. The findings show that the vocabulary used in naming—terms such as *giri*, *argo*, and *gunung* for hill ranges and karst domes, and *luweng*, *song*, and *telaga* for caves and dolines—encodes specific hydromorphological characteristics of the landscape. Hydrological elements are similarly reflected in names containing *Teleng*, *Sumber/Mber*, *Dung*, and *Kali*, which correspond to different flow types within the karst system. Morphological word formation processes, particularly blending, coinage, compounding, and words derived from personal names, play a central role in constructing these toponyms. Overall, the study demonstrates that toponymy serves as a repository of local environmental knowledge and collective memory, and can be utilized as a practical tool for monitoring landscape change, guiding karst conservation, and enhancing community awareness of their geological and cultural heritage.



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2598 - Analysis Of Suffosion Processes In The Badlands Of The Eastern Caucasus Based On Ultra High Resolution Remote Sensing Data

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Badlands — deeply dissected clay landscapes formed in semi-arid climates — are valuable geological heritage sites. Around the world, such areas are actively studied as test site for research into exogenous dynamics, soil vulnerability, and potential natural hazards, and are also considered in the context of natural diversity. In recent years, international research has increasingly used ultra-high-resolution data from unmanned aerial vehicles (UAVs) for detailed monitoring of micro-relief and for the quantitative assessment of erosion and suffosion rates.

The Eastern Caucasus, particularly the southeastern foothills of Dagestan, is home to one of the largest and least studied natural badlands—the northwestern tip of the Palas-Syrtich Upland. Suffosion and pseudokarst processes are actively developing here, but their spatial structure and dynamics have not yet been subjected to systematic field and stratigraphic analysis.

Integrating field observations with ultra-high-resolution UAV imagery will not only reveal the patterns of suffosion forms in the microrelief but also create a basis for assessing landscape diversity and sustainability comparable to approaches used in global badland research.

In 2021–2022, optical and multispectral UAV surveys were conducted at altitudes of 100–200 m on two badland sites (between the Rubas and Kamyshchay rivers). Based on photogrammetric processing, digital elevation models (DEMs) with a 0.2–0.5 m resolution, orthophotomaps, and index images (NDVI, NDWI) were generated. A comprehensive approach was applied: visual interpretation, morphometric and hydrological analysis in SAGA GIS, and comparison with field data to verify the presence of closed depressions, ponors, and subsidence.

Automated recognition using non-local and combined morphometric indices enabled reliable identification of suffosion forms that are invisible on satellite DTMs (SRTM, ASTER). Areas of concentration of large sinkholes (5–15 m) along valleys and small forms (<0.3 m) on slopes were identified. Multispectral indices confirmed the relationship between suffosion depressions and increased humidity and vegetation. Field observations showed that the processes are most active in closed-runoff microbasins.

The integration of field studies and UAV data provides effective mapping of suffosion processes in semi-arid badlands. The results emphasize the need to integrate data of different spatial resolutions and spectral bands.



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C24.29-Land Degradation and Desertification => Agricultural Land Governance and Resource Use Efficiency Under Climate Change



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1228 - Multi Scale Cultivated Land Quality Analysis

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[Background]As a crucial grain production base in Northeast China, the Liaohe River Basin holds strategic significance for regional grain security and sustainable agricultural development. To address the inconsistencies in multi-scale evaluation indicators and the difficulty in comparing results, this study constructs a multi-scale cultivated land quality evaluation framework. [Methods]By integrating wavelet analysis, Geodetector, and stepwise regression model, this framework transcends administrative boundaries, divides research scales based on natural landforms, and achieves cultivated land quality evaluation at macro, meso, and micro scales. [Results]The results indicate that medium-quality cultivated land dominates across all scales with stable spatial distribution, accounting for 61.78%, 43.01%, and 53% at the macro, meso, and micro scales, respectively. Macro-scale variations were dominated by soil texture ($q=0.339$) and drainage efficiency ($q=0.571$); meso-scale by total nitrogen ($q=0.300$) and field slope ($q=0.170$); micro-scale by total phosphorus ($q=0.514$) and field slope ($q=0.210$). Crucially, nonlinear synergistic interactions between factors consistently exerted stronger influence than individual effects across all scales. At the macro scale, natural quality was most influenced by surface soil texture and texture configuration ($q=0.523$), while site quality was dominated by drainage efficiency and elevation variation coefficient ($q=0.746$). At the meso scale, natural quality was primarily controlled by total nitrogen and available potassium ($q=0.426$), and site quality by land contiguity and field slope ($q=0.321$). At the micro scale, natural quality was most affected by total phosphorus and barrier factors ($q=0.691$), and site quality by land contiguity and field slope ($q=0.300$). Through stepwise regression, scale conversion models were successfully established (upscaling $R^2 = 0.49$, downscaling $R^2 = 0.40$), effectively addressing the challenge of cross-scale data integration. [Conclusions] This study provides a transferable methodological framework and scientific basis for multi-scale monitoring and hierarchical management of cultivated land quality, offering valuable support for advancing precision agriculture and sustainable land use planning.



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2140 - Strategic Irrigation Governance Enhancing Resource Use Efficiency Under The Romanian Cap 2023–2027

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As Romania faces escalating “pedological drought” and increasing aridity—particularly in the Southern and South-Eastern plains—the governance of water resources has become the cornerstone of national food security. This study analyzes the strategic shift in the National Strategic Plan (PNS) for the CAP 2023–2027, evaluating how policy instruments transition from reactive crisis management to proactive, efficient irrigation governance, with a focus on the Dobrogea region of Romania.

The research focuses on the intersection of Intervention DR-25 (Modernization of existing irrigation infrastructure) and DR-26 (Establishment of new irrigation systems), which together represent a significant portion of Romania’s rural development budget. The central theme is promoting resource-use efficiency through the adoption of smart technologies, such as automated water metering, remote sensing of soil moisture, and low-pressure delivery systems. It also analyzes the spatial distribution of financing provided to date under these two intervention schemes.

Key governance challenges addressed in this analysis include: (i) assessing the role of Water User Associations and the decentralization of infrastructure management and the effectiveness of collective action in maintaining secondary irrigation nets; (ii) how the CAP 2023–2027 enforces water-saving targets, ensuring that investments do not lead to groundwater depletion or soil salinization and promote sustainability; (iii) integration of irrigation development measures and “Green Architecture” practices, such eco-schemes as PD-04, which promotes soil cover to reduce evaporation.

The findings indicate that while the CAP framework provides essential capital, the primary barrier to efficiency remains the structural fragmentation of land. The abstract concludes that for Romania to achieve true climate resilience, irrigation governance must move beyond hard and rigid infrastructure development to include digital water-management platforms and land consolidation incentives that allow smallholders to access modern hydrants.



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2524 - Mixed Grazing Of Lambs And Ewes Improves Lamb Growth Performance By Reducing Foraging Time And Activity Related Energy Expenditure

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Grazing livestock in grasslands struggle to obtain adequate nutrition, primarily due to the uneven distribution of plant species, as well as fluctuations in vegetation productivity and nutrient content. Combinations of different livestock species, such as cattle and sheep, have been shown to benefit vegetation productivity and animal performance, yet the effects of lamb-ewe co-grazing remain unclear. We conducted a grazing experiment with three sheep grazing strategies (LA=lambs grazing alone; LM/EM=mixture grazing of lambs and ewes; EA= ewes grazing alone) at a stocking rate of 0.89 sheep·ha⁻¹·year⁻¹ from June to September. We analyzed differences in vegetation characteristics, grazing behavior, and sheep growth performance, the relationships among these variables and their effects on sheep growth performance. Above-ground biomass of vegetation under LM/EM was higher than that of EA by 14% (P<0.05). Lambs had a daily foraging time of 9.19 ± 0.14 hours and an energy expenditure of 399.65 ± 8.24 kJ kg⁻¹·BW·0.75·day⁻¹ under LA, both significantly higher than those of lambs under LM/EM (P < 0.05). However, their organic matter digestibility (56.80 ± 1.35%) was significantly lower than that of mixed grazing lambs (61 ± 0.75%). Average daily liveweight gain (ADG) per hectare followed the sequence of LA, LM/EM and EA, while ADG per animal showed no significant difference between LM/EM and LA. This key difference among grazing strategies was mainly due to greater crude protein intake and lower grazing energy expenditure under mixed grazing, which together enhanced lamb growth performance. These findings demonstrate that mixed grazing is an effective strategy to enhance pasture productivity, improve animal performance, and promote sustainable grassland management.



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3200 - Spatiotemporal Assessment Of Drought And Its Impact On Crops In Romania

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Cropping systems in Romania are to a large extent climate-dependent. At the same time, they are highly vulnerable to the raising frequency of climatic extremes and droughts, which are expected to intensify in the future, necessitating integrated and contextual adaptation. This study assesses the spatiotemporal patterns of drought severity across Romanian agricultural regions over the last three decades, and investigates the relationship between drought intensity and crop yield anomalies. Utilizing the Standardized Precipitation Evapotranspiration Index (SPEI) and various biometeorological indices, the research characterizes drought features and critical phenological behaviour under water- and temperature-limited conditions. A Copula-based probabilistic modelling approach is employed to integrate these indices with county-level yield data (1990 to 2024) for winter wheat, maize, sunflower and grape crops. This methodology allows for the inference of joint dependence and exceedance probabilities across five levels of severity, ranging from high to extreme. The results reveal a pronounced spatial distribution of extreme drought events across the agricultural regions of Romania, notably in 2000, 2007 or 2024, which caused significant economic losses. Remarkably, the analysis demonstrates that the magnitude of yield loss due to drought often exceeds the severity of the drought itself, particularly for maize and sunflower crops. These findings highlight the added value of probabilistic methods for drought-impact assessments, and provide scientific bases for evaluating factors influencing agricultural vulnerability and for exploring viable adaptation options, thus offering perspectives for sustainable planning of farms and cropping systems. This work was supported by a grant of the Ministry of Research, Innovation and Digitization, CNCS-UEFISCDI, within PNCDI IV; project name: «Changes in climate suitability of Romanian vineyards» (CARVE); project number PN-IV-P1-PCE-2023-1875.



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C24.29-Land Degradation and Desertification => Land Degradation. Current Knowledge, Scientific Challenges and Solutions



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1165 - Long Term Effects Of Restoration On Soil Hydraulic Properties In Revegetation Stabilized Desert Ecosystems

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An important consideration when dealing with migrating sand dune-stabilization activities in water-limited ecosystems is the evolution of soil hydraulic properties. Knowing if and how soil hydraulic properties are altered by revegetation practices is basic to create vegetation-protective systems that control or cease migration of sand dunes. Research in the field of soil physics has contributed to the knowledge of water movement and water storage in the soil, but the general application of this knowledge to revegetation hydrology has not kept pace with increasing need to understand problems of how water use and evapotranspiration are regulated in these dune environments. Improving structure of soils found at 0–5 cm depth, and increasing the thickness of biological soil crusts are both associated with sand dune revegetation-stabilization in arid northwestern China. Since 1956, research on sand dune stabilization has included the use of straw chequer-boards to facilitate development of soil structure. One method to gauge the degree of stabilization is to compare undisturbed soil hydraulic properties, including water retention $[h(\theta)]$ and hydraulic conductivity $[K(h)]$ functions, with properties from stabilized sites of different ages. This study examined properties at five experimental sites of different ages since revegetation (51, 42, 34, 20 and 0 years). Saturated hydraulic conductivity (K_s) was determined in-situ from all five sites, and the $h(\theta)$ curve was determined from samples collected from three sites. A significant negative correlation existed between K_s and the clay, silt and organic matter contents. Differences in most van Genuchten parameters for $h(\theta)$ were observed between the revegetated plots and the migrating sand dune area. Results of this long-term study show that changes in soil hydraulic properties and improvement in soil structure were associated with migrating dune stabilization.



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1200 - Contribution To The Study Of Sediment Transport In Northern Algeria

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Ensh, Hydrology, Blida-Algeria ¹

There is currently an increasing erosion phenomenon in watersheds. COTE M. (1971) presented blatantly the extent of the erosion phenomenon in Algeria (the most significant values in North Africa that can reach 2000 t/Km²/year). Water erosion is the most common and severe form. It depends on the area resistance and climate aggressiveness. The intensity of erosion occurs mainly during flood periods, where a significant amount of sediments passes to impoundments.

Erosion, sediment transport and sedimentation are the cause of the degradation of agricultural soils, siltation of dams and a lot of damage whose costs are considerable. In Algeria, for instance, the hydro-mechanical development studies come up against the problem of the lack of data on sediment transport in order to assess its importance. This leads the engineer to use the available empirical methods for assessing the solid quantities transported annually by the river under examination. For this, we considered interesting to develop a model for calculating sediment transport, on an annual scale, based on two parameters available at the level of all the watersheds controlled by hydrometric stations, i.e., liquid flow and surface area. To give more meaning to the model, we used data from 71 Algerian stations and dams. After using the data of 55 measuring sites for calibrating the model, the validation of the model on 16 stations using the Nash criterion was discussed. For the relationship to be linear, the variables were log-transformed. All Correlation coefficients are significant at the 95% threshold. The developed model is a power model with a multiple correlation coefficient of 0.87. The Nash criterion in the calibration and validation of the model is 78% and 83% respectively.



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1458 - Gully Erosion Modelling In The Black Soil Region Of Northeast China

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Gully erosion represents one of the most severe forms of land degradation. It not only causes substantial soil and water loss, but also fragments arable land, increases cultivation costs, and reduces crop productivity. Understanding the mechanisms governing gully initiation and development, and establishing reliable predictive models, is therefore essential for effective gully erosion control. The Northeast Black Soil Region is one of China's most important commercial grain production bases. However, intensive cropland cultivation, combined with long and gentle hillslopes and climatic factors such as freeze-thaw cycles, snowmelt runoff, and concentrated rainfall events, has made this region highly vulnerable to severe gully erosion. In this study, multi-scale approaches were employed to investigate gully erosion processes. At the regional scale, cross-section surveys and high-resolution remote sensing interpretation were used to characterize gully morphology and spatial distribution patterns. At the small-catchment scale, ten years of continuous field monitoring were conducted to quantify differences in ephemeral gully erosion driven by spring snowmelt runoff and summer rainfall, and to develop predictive models incorporating tillage practices, topography, and precipitation characteristics. At the hillslope scale, representative permanent gullies were monitored for up to 20 years using RTK-GPS and UAV surveys to analyze medium-term gully evolution and to establish rainfall-driven volume increment models based on rainfall characteristics and drainage area. Results indicate that gully morphology is strongly controlled by geomorphic types. Hillslope gullies in the Northeast Black Soil Region can be classified as short-wide in tablelands, long-narrow in rolling hills, and intermediate in hilly areas. Ephemeral gully erosion driven by snowmelt and rainfall contributed comparable sediment yields in rolling hill catchments. Annual snowmelt-driven and rainfall-driven ephemeral gully erosion models were developed, accounting for snow redistribution, tillage type, crop cover, and ridge direction: $EV_{\text{snowmelt}} = 0.102 \cdot SN1.104 \cdot SR \cdot A^{0.90} \cdot T^{3.0}$ and $EV_{\text{rainfall}} = 79.60 \cdot (ai \cdot A)^{3.77} \cdot P^{5-90.91}$. In addition, an annual rainfall-driven permanent gully erosion model was established based on drainage area and rainfall characteristics: $PV_{\text{rainfall}} = 3.883 \cdot 10^{-10} \cdot (A \cdot PR^{5-7})^{2.531}$.



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1464 - Analysing Sediment Connectivity In The Polish Carpathians – Conformity With Catchment Morphological Properties And Land Use

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Downstream sediment transfer, viewed through the lens of structural sediment connectivity, remains one of the least understood aspects of catchment-scale geomorphic analysis in the Polish Carpathians. This mountainous region, characterised by steep slopes, diverse lithology, and a history of intense human modification, provides an ideal setting to examine how sediment dynamics respond to both natural and anthropogenic factors. This study compares variations in sediment connectivity across river catchments with differing terrain properties (e.g., slope gradient and relief), degrees of artificial channel regulation (including check dams and grade-control structures), and land-use patterns (ranging from intensive agriculture to abandonment and reforestation). Predicted spatio-temporal variations in sediment yield and delivery to the catchment outlet were modelled and validated against historical measurements of sediment loads from gauging stations, revealing significant declines in contemporary sediment flux compared to mid-20th-century peaks. Sediment delivery modelling incorporated downstream transport via lateral (hillslope-to-channel) and longitudinal (along-channel) pathways, explicitly accounting for temporal changes in land-use practices since the post-socialist transition (e.g., widespread farmland abandonment and forest expansion). Spatial variations in these temporal trends were assessed in two contrasting catchments with different geoenvironmental settings: one highly confined with active landslides, and another more open with extensive morphological buffering. Valley morphology and degree of confinement play a significant role in facilitating or impeding lateral sediment delivery, while preserved landslide pathways serve as ideal conduits for rapid hillslope-channel coupling. Conversely, morphological buffers (e.g., alluvial fans and terraces) and artificially constructed barriers function as important local sediment sinks, disconnecting upstream sources. Currently, abandoned agricultural fields, forest encroachment on former pastures, and parallel drainage infrastructure development have substantially reduced sediment yield and diminished lateral connectivity between hillslopes and floodplains. These findings highlight the potential for land-use transitions to mitigate ongoing land degradation processes, such as soil erosion and excessive sedimentation, contributing to more sustainable catchment management in vulnerable mountainous regions.



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1544 - The Impact Of Parallel Bridge Infrastructure On Fluvial Processes And Channel Stability In The Eastern Himalayan Foreland India

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Transport infrastructure has a significant impact on land degradation in dynamic riverine landscapes. This study investigates how parallel bridge structures modify extreme flood hydraulics in the Torsa River in the Eastern Himalayan foreland and evaluates the resulting implications for channel stability and land degradation. Using 2D hydraulic modelling (HEC-RAS), we compared the impact of 100-year flood discharges on a braided reach and a meandering reach. Scenarios with and without existing parallel road and rail bridges were analysed. The bridges cause significant localised changes to the hydraulics, including backwater effects and accelerated flow between piers. Notably, the impact is strongly influenced by channel morphology. In the braided reach, increases in flow velocity, bed shear stress and stream power were more severe and extensive, exacerbating erosion and sediment transport potential. In contrast, the effects in the meandering reach were more localised. Although there was no overtopping of the bridges, the amplified hydraulic stresses, particularly observed in the braided channel, directly intensify scour and bank erosion, driving accelerated morphological adjustment. These findings emphasise that bridge infrastructure, particularly in multi-threaded braided systems, exerts sustained anthropogenic pressure that can trigger fluvial land degradation. This includes accelerated bank retreat, bed incision and sediment redistribution, all of which threaten adjacent land use and the resilience of infrastructure. The study emphasises the need for development planning and infrastructure design in vulnerable forelands to explicitly consider channel type in order to mitigate long-term geomorphic degradation and support sustainable river basin management.



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1577 - Soil Degradation An Underestimated Driver Of Migration Intentions Case Study In Northern Senegal

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Our study addresses a key limitation of the extensive literature on the relationship between population migration and environmental change. We demonstrate that migration intentions in rural areas are influenced more by the perception of soil degradation than by temperature and rainfall variability. Based on an empirical survey of 905 households in northern Senegal, our logistic regression results indicate that households that view soil degradation as a problem are the most likely to express migration intentions. Soil degradation appears to have a greater impact because its effects on current and future agricultural productivity are more concrete and direct. This paper contributes to our understanding of why the existing literature is inconclusive regarding the impacts of temperature and rainfall, and suggests that focusing on soil degradation and more broadly land degradation would help us to better understand rural migration intentions in a context of climate change. This result contributes to recent calls to “expand the current research agenda on environmental migration to include land degradation in migration and displacement studies explicitly”. Much additional research is indeed needed to understand the complexities of the interactions among environmental perceptions and migration intentions. Soil degradation does not deterministically cause migration, rather, it interacts contextually with other environmental and socioeconomic drivers.



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2575 - Socioenvironmental Impacts Of Lithium Extraction Driven By The Energy Transition In The Atacama Desert Chile

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Background/Hypothesis

The Atacama Desert is a geographic paradox: extreme aridity, high solar radiation and evaporation, high-Andean salars, oasis-based livelihoods, and long-standing Indigenous settlements coexist with globally strategic lithium reserves. Hypothesis: Chile's National Lithium Strategy will intensify production in the Salar de Atacama and expand extraction to additional Andean salars, degrading fragile ecosystems and Indigenous territories through large-scale water appropriation, without ensuring territorial sustainability or equitable benefits for peripheral commodity-exporting states.

Materials and Methods

We synthesize secondary sources (SERNAGEOMIN geology, DGA hydrology, COCHILCO production statistics, Likanantay community reports, and policy documents) and conduct geospatial analysis of salars and hydrographic basins in GIS (ArcGIS Pro). This is complemented by a qualitative review of environmental impact assessments and socioeconomic studies of transnational operations, informed by prior field observations (2020-2025). Water-demand estimates use reported intensities of 1-2 million liters per tonne of lithium.

Results

Lithium production requires approximately 1-2 million liters of water per tonne; continued scale-up would intensify pressure on water-scarce Andean landscapes that function as biodiversity refugia and cultural territories for the Likanantay. Consultation processes and compensation agreements may secure a social license, yet they often overlook cumulative impacts at basin scale and externalize long-term hydrological risk. High-energy consumption in core economies is sustained while water and environmental costs are localized in Atacama.

Conclusions

Lithium extraction is deepening socioenvironmental conflict in Atacama by prioritizing technological transition over territorial justice. We recommend less

water-intensive extraction technologies, binding environmental safeguards at basin scale, and Indigenous co-governance for water and salars to align decarbonization with equity.



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C24.30-Land Use and Land Cover Change => Innovative Methods for Extracting and Utilising Historical LULC Data



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2563 - Large Scale Mapping Of Long Term Changes In Land Cover In Protected Areas Of Sevan National Park

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Large-scale land cover maps for protected natural areas are a key tool for environmental monitoring and natural resource management. In the absence of up-to-date maps, these tasks are difficult. For the Artanish Peninsula, a protected cluster within the Sevan National Park (Republic of Armenia), the latest available maps were compiled between 1929 and 1954. At the same time, the peninsula's landscapes have undergone significant changes: the lowering of Lake Sevan has exposed areas, pine trees have been planted to stabilize slopes, and the recreational and economic impacts have increased. The aim of this study was to develop a map highlighting land cover types based on remote sensing data and ground verification.

Using modern machine learning methods that ensure high classification accuracy, especially for spectrally homogeneous landscapes, large-scale ground-cover maps were compiled with detailed gradation of classes and subclasses, including vegetation types.

Remote sensing data from space images taken at different times was used. Data collection was conducted using UAVs in RTK mode. Photogrammetric processing was performed in Agisoft Metashape using Structure-from-Motion algorithms. Four supervised machine learning algorithms were used for classification: maximum likelihood (ML), k-nearest neighbors (KNN), support vector machines (SVM), and random forest (RF). Multispectral channels, NDVI, GNDVI, and SAVI indices, as well as relief data (Copernicus DEM), were used as features. The training sample was formed based on field routes and descriptions.

As a result, large-scale map of the current land cover of the Artanish Peninsula was created. Preliminary classification using machine learning algorithms (KNN, SVM, RF) identified the dominant cover types. The largest errors occurred when separating sparse juniper forests and grass cover due to spectral mixing. This required visual interpretation with a detail level of up to 20 vegetation and 9 anthropogenic classes.

Machine learning methods are effective for preliminary classification of homogeneous land cover. In complex mountain landscapes, integration with visual interpretation and field data is needed. The combined approach provides the detailed maps required for biodiversity conservation.



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2595 - Estimates Of Carbon Stocks And Their Changes Over Time Based On Ultra High Resolution Remote Sensing Data

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Carbon sequestration from the atmosphere is one of the key measures for combating global climate change. The ability of vegetation and soils to absorb carbon is widely used to implement carbon sequestration measures. Thus, among strategies to absorb atmospheric carbon, reforestation is recognized as the most effective. Less attention is paid to other carbon pools, such as grassland communities and soils, despite their comparable ability to absorb and store atmospheric carbon. Complete and detailed information on carbon stocks and flows allows for more effective implementation of carbon sequestration measures. Statistical models, land cover and land use maps, and data from sample plots are used to estimate carbon changes and stocks at the highest level of accuracy. There are remote sensing methods that allow for more accurate data at low cost, such as digital aerial photogrammetry. The main product of this method is a three-dimensional point cloud, which provides information on vegetation structure. They also contain some spectral information in the visible range, since point clouds are derived from image data. Collectively, this information can be used with traditional statistical models of tree growth and with modern machine-learning-based methods to estimate carbon stocks. These methods involve extracting a set of features describing the three-dimensional structure and spectral characteristics of objects, which are then compared with field data on biomass and dry carbon mass. With a multi-temporal dataset, it is also possible to analyze temporal dynamics through changes in land cover and land use. This paper discusses the use of digital aerial photogrammetry and methods for estimating carbon stocks and changes using the example of test site in the forest-steppe chernozem zone of Russia. The territory includes protected steppe and broadleaf ecosystems, as well as agricultural landscapes. The UAV data covers the period from 2015 to 2021, which provides an opportunity for a broad analysis of ecosystem changes and carbon stocks using this territory as an example. The main results of this work include detailed information on carbon stocks and changes in environmental components, as well as an analysis of land cover dynamics over the observation period.



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2705 - Landscape Dynamics Typology For Utilising Historical Land Use And Land Cover Data

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Understanding why grasslands persist, fragment, or disappear requires methods that link mapped land-cover change with socio-economic trajectories recorded in administrative statistics. This contribution tests how Landscape Dynamics Typology (LDT), a classification framework that labels land transformations by composition (loss/gain) and configuration (fragmentation/aggregation) processes, can be operationalised with digitised land use and land cover (LULC) data to interpret long-term grassland trajectories.

We compile multi-temporal LULC layers derived from digitised cartographic sources and harmonise classes across time to create comparable snapshots. The analysis unit is the administrative boundary, chosen because it enables longitudinal comparison and links directly to time series on population, farming structure, and agricultural production. Using the LDT ecosystem (LDTtool for ArcGIS, LDT4QGIS scripts, and/or the LDTR package), we compute change metrics for grassland class (e.g. changes in area and number of patches) and translate them into Types of Dynamics (ToD) that geolocate where specific processes dominate.

To make results interpretable beyond the map, we aggregate ToD frequencies and dominant ToD per administrative unit and derive a typology of grassland dynamics. We then relate this typology to available statistical indicators, such as livestock density, agricultural employment, farm size structure, demographic change, and indicators of intensification or abandonment, using exploratory clustering and driver-screening analyses. This design creates a direct link between LULC evidence and the socio-economic conditions that may explain diverging grassland outcomes.

Expected contributions are: (1) a reproducible workflow integrating LULC processing with LDT-based interpretation; (2) a spatially explicit, administratively comparable typology of grassland dynamics; and (3) empirically grounded hypotheses on socio-economic conditions associated with distinct ToD profiles. While demonstrated using grasslands in Slovenia, the approach is transferable to other regions and land-cover themes, supporting interdisciplinary research and providing actionable insights for landscape management and spatial planning. In line with current advances in data extraction, the workflow accommodates varying positional accuracy and classification uncertainty by documenting harmonisation decisions and reporting sensitivity of ToD results to alternative class groupings.



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C24.30-Land Use and Land Cover Change => Land Use/Land Cover Change Driving Forces and Impacts



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1027 - A Causal And Explainable Framework For Monitoring Human Driven Land Changes In A Large Urban Area

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Understanding human–environment interactions in urban settings is critical for achieving ecological sustainability alongside socioeconomic development. While remote sensing excels at detecting broad-scale changes such as deforestation and urban sprawl, it often misses more subtle, temporally dynamic anthropogenic impacts on ecosystems. To address this limitation, we present an integrated methodology that combines multitemporal remote sensing, causal inference, and explainable artificial intelligence (XAI) to quantify human-induced terrestrial ecosystem changes across diverse land cover types. Leveraging convergent cross-mapping, we disentangle causal relationships among climate variables, human activity, and vegetation dynamics. These interactions are modeled using linear regression, random forests, and neural networks, with XAI techniques applied to isolate anthropogenic effects at monthly resolution. We demonstrate the utility of this framework through a case study of the New York metropolitan region. Results reveal policy-driven greening in dense urban cores, contrasted by vegetation loss in expanding suburban areas. Additionally, workforce reductions during the COVID-19 pandemic led to temporary declines in greening, underscoring the social vulnerability of urban green infrastructure. By enabling dynamic, causally interpretable ecosystem monitoring, this work advances the capabilities of remote sensing and geospatial analytics and provides a powerful decision-support tool for policymakers, urban planners, and conservation practitioners. It facilitates adaptive management strategies in the face of accelerating ecological and societal transformations, reinforcing the importance of data-driven approaches to sustainable development and environmental resilience.



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1773 - Landscape Planning A Look At Methodology And Implementation Taking Into Account The Consequences Of The War In Ukraine

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Landscape planning is an important tool for integrating environmental considerations into spatial planning, and is used in many European countries. Since 2010, Ukraine has also begun to develop pilot landscape plans at the regional and local levels, subsequently making the development of landscape plans at the local level a legal requirement. At the same time, the full-scale war started by Russia in 2022 has caused a number of impacts on the environment, resulting in the degradation of its components and the loss of their properties in the long term.

These include, for example, changes in relief and the formation of new specific geomorphological systems, physical changes in soils, chemical contamination, changes in the composition and activity of soil biota and disruption of ecosystem functions, changes in landscapes, in particular agricultural and forest landscapes, cultural landscapes, etc. Accordingly, spatial plans, as well as their environmental component, should be developed taking into account these impacts, using an improved methodology. This applies to virtually all Ukrainian communities, as large-scale shelling and destruction affect the entire country to one degree or another. Updating the methodology is complicated not only by the need to find and take into account the experience and cases of restoration of territories affected by military operations, but also by the limited possibilities for data collection due to the risks of conducting field research in some territories and the limitations of the monitoring system. This raises the question of maximising the use of indicators that can be obtained by remote sensing methods.

The presentation will provide the results of an analysis of the main environmental impacts of military operations, propose a set of indicators that enable remote assessment of the state of environmental components and changes therein, and present an overall vision for providing landscape plans with remote sensing data.



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1916 - Land Use Land Cover Changes In Russia In 1992 2020 Main Drivers And Environmental Challenges

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Land use land cover change resulting from increased anthropogenic pressure is one of the most important factors in global environmental change. Numerous studies on this topic have been conducted on a global, continental, and national scale, as well as for individual regions and cities. Much less frequently, the dynamics of land cover and the processes it causes are studied within natural landscape boundaries. The aim of this study is to identify significant trends in land cover transformation in the Russian Federation over a thirty-year period (1992–2020) within the boundaries of ecological zones. The source used is the geospatial data from the European Space Agency's Climate Change Initiative (ESA CCI LC). The study included several stages: 1) inventory and mapping of areas of change and types of transitions between different land cover categories for 1992–2020 for eight ecological zones; 2) grouping the identified transition types by transformation processes and analyzing the manifestation of processes in each of the ecological zones; 3) assessing the trends and drivers of the identified changes and their possible environmental consequences.

It has been established that about 40% of areas with altered land cover are characterized by a decrease or loss of biological productivity as a result of desertification and deforestation, while 9% of areas with changes have seen an expansion of anthropogenically modified and technogenic landscapes. About a quarter of all changes are characterized by processes of ecological rehabilitation and restoration of the ecological potential of the land. The identified areas of change can be considered as stages of dynamic restructuring of natural and anthropogenic systems and changes in their ecosystem functions and can be used for strategic planning of ecosystems conservation and management.



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2347 - Fifteen Years From The Great East Japan Earthquake Tsunami Disaster – Present State Lessons And Challenges Of Land Use And Land Cover Changes

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Fifteen years have passed since the gigantic earthquake and the consequent tsunami hit the Pacific coastal areas in North-East Japan on 11 March 2011 and inflicted enormous damage to those vast areas directly and indirectly. The disaster, known as the Great East Japan Earthquake Disaster, in fact still continues in many ways, although much of the major construction works, including construction and re-construction of motorways, many new residential areas on higher elevation, tall seawalls as well as numerous memorial facilities, had been completed in about ten years. The devastating impact of the accident of Tokyo Electric Power Company Fukushima Daiichi Nuclear Power Plant by the earth quake and the tsunami and the radioactive contamination that followed have been particularly serious, and recovery and re-vitalization of the stricken areas are still far beyond scope in much of the contaminated areas and around in Fukushima Prefecture despite the Japanese government's attempt to show normality of those areas by pouring huge amount of money into them. The present paper identifies notable land use and land cover changes and their processes in those areas, and discusses the diverse driving forces and historical, cultural and socio-economic backgrounds as well as physical settings and lessons and challenges related with them.



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2363 - Agricultural And Forestry Dynamics In Romania Under Near Future Climate Change Scenarios

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Climate change is reshaping land-use/cover dynamics worldwide, yet the potential magnitude and spatial distribution of these transformations remain mostly uncertain at the regional scale. The climate change impact on agriculture and forestry in particular is widely known, mostly referring to changes in productivity, change in water availability, spread of pests and diseases, influencing the quality of ecosystem services. Both agriculture and forestry have also an important role in climate mitigation and adaptation, thus understanding their dynamics in the future may help in designing sustainable management strategies.

This study assesses the potential impact of future climatic conditions on agricultural and afforested lands in Romania over the 2019–2050 period, by integrating three distinct climate projections, i.e. SSP1–2.6, SSP3–7.0, SSP5–8.5, into a spatially explicit land-use pattern modelling. The analysis combines various land use/land cover datasets, biophysical and socio-environmental variables, and employs a hybrid modelling framework, i.e., CLUE-s model (Conversion of Land Use and its Effects at Small regional extent), to simulate land-use/cover transitions under different climate pathways.

Results indicate significant spatial heterogeneity of potential land-use/cover change for different geographical regions, with processes such as intensification/extensification of agriculture, deforestation/reforestation, land abandonment or urbanization influencing the regional patterns of the dynamics. There is a clear regional difference of climate change implication on forestry and agriculture: while an extension of forested area is expected for central and northern regions in some scenarios, while a decline in some permanent crops (e.g. vineyards) for low-altitude regions is projected in some other. These findings underline the necessity of regionally adaptive management policies towards climate-resilient agriculture and forestry.

The study contributes to the growing understanding of how climate–land-use/cover interactions may shape future landscapes and provides a methodological framework for integrating climate scenarios into spatial planning and sustainable land management.



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2404 - The Impact Of Agricultural Policies On Land Use In The Republic Of Moldova In The Last 50 Years. A 3 District Case Study Anenii Noi Causeni And Stefan Voda

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In the context of developing a sustainable and smart land-use on a long-term basis with respect to climatic and soil conditions in the Republic of Moldova, this paper aims to demonstrate the evolution of the impact of agricultural policies on land use from the late socialist period (1970s) to date. Thus, topographic maps (1977), aerial photographs (2007), Sentinel-2 images, and CORINE Land Cover (2023) will be used to analyse historical and current land use and detect changes in three districts (Anenii Noi, Causeni, and Stefan Voda) using GIS software. The transformation of arable land into pastures and abandoned land is evident in the Southeastern part of the Republic of Moldova, following the end of collective farming. In addition, the article is enriched with historical data and pictures on the periods of collective farming in socialist Moldova (before 1990), dismantling of the collective farming system (1990s), and two-stage privatization (privatization before 1996 and the "Pamint" project 1998-2000). Assessing future landscape development, several trends are identified. As part of the transboundary research project, The impact of European agricultural policies on land use: Romania's experience and lessons for the Republic of Moldova in a European perspective – MapLURoMd, this study's outcomes will certainly be useful for improving today's agricultural policy in the Republic of Moldova.



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2448 - Territorial Transformations Driven By The Expansion Of Photovoltaic Power Plants In Romania

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Romania has experienced a rapid expansion of photovoltaic energy infrastructure over the last decade, generating significant territorial transformations and increasing pressure on land use and electricity networks. This paper analyses the spatial evolution of large-scale photovoltaic power plants developed between 2010 and 2025 and assesses their implications for land use, grid stability, and energy planning.

The analysis is based on a national geospatial database that identifies 304 photovoltaic installations built between 2010 and 2020, subsequently updated with 204 additional power plants developed over the following five years. The results indicate a strong continuity in location patterns, with approximately two thirds of installations consistently sited on arable land. This trend reflects developers' preference for flat, accessible areas with proximity to existing electrical infrastructure, despite policy efforts aimed at protecting high-quality agricultural land.

The paper further situates these spatial dynamics within the evolving European renewable energy policy framework, including Fit for 55, RePowerEU, and the Renewable Energy Directive (RED III), which have accelerated solar investments across member states. In parallel, the rapid growth of residential prosumers supported by the Casa Verde Fotovoltaice programme, Romania's national subsidy scheme for residential photovoltaic systems, has altered local electricity flows, exposing structural limitations within Romania's distribution networks. The findings highlight the need for integrated spatial planning, grid modernisation, and the deployment of energy storage solutions to ensure the sustainable expansion of solar energy in Romania.



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2488 - Estimation Of Changes In Aboveground Forest Carbon Stock Under Near Future Climate Change Scenario

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Abstract: Aboveground forest biomass is a crucial component of the global carbon cycle in the context of climate change and represents a major and relatively stable carbon reservoir. Therefore, analyzing potential future changes in forest-cover patterns, including climate change variables, can support the assessment of climate warming impact on forest biomass and, consequently, carbon stocks at different spatial and temporal scales. In this context, the present study aims to model the potential changes in aboveground forest carbon stock based on a forest-cover pattern scenario projected for the year 2050, by integrating climate projection, i.e. SSP3–7.0, into a spatially explicit land-use/cover pattern modelling. The analysis combines various biophysical and socio-environmental static variables with observed and projected temperature and precipitation during the growing season, integrated within a hybrid modelling framework, namely the CLUE-S model (Conversion of Land Use and its Effects at Small regional extent), to estimate future forest-cover pattern changes under two climate pathways: current and future.

Both forest-cover pattern scenarios indicate a general forest-cover area increase by 2050, the current climate pathway indicating a net increase by 2.3%, while the future climate pathway a net increase of 3.5% compared to current situation. Although both scenarios project an expansion of forested areas, comparisons with the actual situation indicate a positive aboveground forest biomass dynamic only under the future climate pathway, suggesting a potentially positive contribution of climate warming to the forest carbon stock.

This study contributes to improving the understanding of future aboveground forest biomass and carbon stock dynamics in European countries. Moreover, given their predictive character, the findings provide a useful basis for further research into the potential ecological, socio-economic, and forest management responses to changes in aboveground forest carbon cycle under climate change.



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2501 - A Regional Analysis Of Land Use Agriculture And Sustainability In Rajasthan (india)

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Rajasthan is the largest state (area wise) of India with arid and semi-arid climatic conditions. The state can be divided into four distinct geographical regions having variable topographical, climatic and demographic characteristics resulting in different land use patterns. The level and nature of human intervention also vary across these regions causing different types of land use changes and sustainability challenges.

The study presents a regional analysis of land use patterns, changes in such patterns, factors associated and sustainability concerns across the state. The land use patterns have been analyzed for different categories of land use like forest, cropped area, pasture and grazing lands, fallow lands and land not available for cultivation. Cultivation of crops is the most important land use category in Rajasthan as about 54 percent of the total reporting area is devoted to agriculture. It is because of this reason a special emphasis has been made to study the intensity of cropping and cropping patterns in the study area.

The analysis is based on secondary data obtained from the government reports on land use, agricultural statistics, forest survey and satellite imageries and field visits. The temporal analysis of the land use data reveals significant changes in land use driven by population growth, agricultural expansion, growth of irrigation facilities, mining activities and construction of other development projects. Irrigation and other technological interventions in agriculture have caused significant changes in the cropping pattern and increased the production and productivity of crops but at the same time such interventions have resulted in land degradation and creation of waste lands. In this study emphasis is placed on evaluating the long-term sustainability of current land use, particularly the agricultural land use, practices. The study calls for a region-specific land management strategies and suitable agricultural practices so as to achieve the objectives of environmental protection and food security on sustainable basis.



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2549 - A Spatial Land Use Optimization Framework For Carbon Neutrality In The Jakarta Metropolitan Area

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Background / Hypothesis

Land use planning plays a critical role connecting economic growth with climate mitigation strategies, guiding resource allocation to optimize land use efficiency while minimizing environmental impacts. In Southeast Asian megacities such as Greater Jakarta, ongoing urbanization and industrialization have exacerbated land use changes, enhancing the risks of increased carbon emissions and environmental degradation. Therefore, studying land use optimization and strategies in the Jakarta metropolitan area is of paramount importance for achieving carbon neutrality.

Materials and Methods

We developed a novel integrated land use optimization framework that combines land use demand forecasting and spatial allocation modeling. The framework incorporates mixed-integer programming to represent land use competition under policy and allocation constraints, discrete choice models to estimate land use suitability, and cellular automata to capture spatial interactions and neighborhood effects. Scenario simulations are conducted for the Greater Jakarta metropolitan area under alternative development pathways, including business-as-usual, high economic development, and low carbon development scenarios.

Results

Model validation demonstrates a high level of agreement between simulated and observed land use patterns, indicating robust performance in reproducing historical land dynamics. Scenario analysis reveals that unconstrained economic growth leads to extensive expansion of built-up areas and increased environmental pressure, while low-carbon-oriented development produces more compact urban patterns and improved preservation of agricultural and ecological land. The results highlight clear trade-offs between development intensity and environmental performance, and demonstrate the potential of land use optimization to guide spatial pathways consistent with carbon mitigation goals.

Conclusions

This study shows that hybrid land use optimization framework, which integrates spatial simulation, decision modeling, and optimization techniques, leverages the strengths of each method to enable a more realistic, precise, and flexible land use allocation process. By prioritizing land use structure and spatial configuration, the framework provides a flexible foundation for evidence-based low-carbon urban and regional planning.



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2615 - Spatially Targeted Management At Large Scales Using Diverse Datasets A Case Study Of Agricultural Land Use In River Basins In England.

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This paper explores the potential of diverse data on the environment and statistical techniques to support spatially targeted management to balance the benefits of nutrient retention and agricultural production at a national scale in England.

Agriculture is known to be a major source of nitrogen (N) and phosphorus (P), and nutrient runoff from agricultural practice is an underlying cause of eutrophication in many catchments, with its associated negative impact on water abstraction, invertebrates and fish. Increasingly there is a focus on land cover change to increase water quality in catchments, usually from agricultural crops to forest, peatland or wetland, that is, from land use that inputs N and P into river systems to one that can capture N and P. However, this causes tension between the benefits that society receives from nature, that is, between the benefits of agricultural production and good water quality.

In this work I use statistical modelling to quantifying the relative importance of agricultural land use as a predictor of catchment nitrogen and phosphorus concentrations in river basins in England, with the aim of identifying the areas where a shift away from agricultural land use is likely to have the largest positive effect on water quality.

Climate change is likely to increase pressure on river systems and the ecosystem services they support, which will increase the need to target management strategies to preserve the benefits we receive from nature.



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3211 - Investigating Heterogeneity And Complexity Of Urban And Natural Landscape Morphologies In Europe Over Time

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Introduction

The global urban population continues to grow, and cities are expanding into periurban areas, further fragmenting their surrounding rural landscape. Although research and planning generally agree that more compact cities are less detrimental to society and the environment than sprawling ones. Clearly, assessing the impacts of urbanisation requires evaluating not only the amount of land converted to urban use, but also the spatial configuration and morphology of its contours.

Methodology

The perimeter-to-area ratio is a metric commonly used in ecology to analyze the spatial configuration and constitutive elements of a patch (a land considered homogeneous). Our models identify the bilogarithmic relationship between p and a represented an exponential model. We have explored different fitting methods to measure the complexity of urban and natural patches. By applying the methodology to Urban Atlas data over 3 different years (2006, 2012, 2018), we can study how the complexity of land use/cover is changing over time and understand how urbanization patterns impact environment and the city itself? Our goal is to address those issues head-on by assessing the robustness of the index to the definition of patches and to the aggregation methods.

Results

In 2018, the estimated coefficients indicated mean values of 0.713 and 0.719 for urban and natural patches in Europe, respectively. While urban complexity remains constant over time, natural complexity decreased from 0.968 in 2006 to 0.931 in 2012. We provide clear reference values over time and explore the different types of patches. Complex urban patches are found in Portugal, Belgium, the Netherlands, and Poland, while simple urban patches are in Spain, Germany, and the northern countries.

Conclusion

This demonstrates the potential for integrating this analysis into future ecological studies or urban planning, confirming a reduction in the complexity of the natural spaces and questioning the interaction with urban complexity.



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C24.30-Land Use and Land Cover Change => Land Use/Land Cover Changes and Land Degradation in the Anthropocene



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1044 - Forest Area Changes Over A Hundred Years Driving Factors Impacts And Modelling Implications For Biodiversity And Nature Conservation

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Forests provide essential ecosystem services, including carbon sequestration, climate regulation, water retention, biodiversity conservation. Furthermore, they play a significant role in economies, as a critical factor for development of bioeconomy and replacement of fossil resources with renewable ones thus supporting sustainable development. Different driving factors affect changes of forested areas including socio-economic factors (political, economic, legal, environmental, technological, environmental and others) as well as natural (climate, geophysical, soil properties and others). Combination of weight of each of these factors is a manifestation of ongoing change of forested areas in Europe. Large-scale cultivation (industrial forestry) of single-species plantations reduces the structural and species diversity characteristic of natural forests, thereby reducing habitat availability for birds, insects, mammals, and understory vegetation. The changes of forest cover in the Europe suggests not only forest area enlargement but also changes in forest structure and age, driven by afforestation initiatives and natural reforestation processes. The aim of this study is to evaluate modelling possibilities as management tool of forested areas in Latvia using TerrSet geospatial software system and CORINE Land Cover data base. Modelling results were validated using field and historical data for past 40 years. The analysis of LULC changes in the areas studied during last decades demonstrates significant trends resulting from interaction between natural processes and human activities. The temporal analysis shows transformations in the landscape, reduction of ecosystem services, declines in forests, and shifts in agricultural land use due to transition from socialistic to free market economy as well as impacts of invasive species spreading (major increase during last 40 years). These findings reflect ongoing processes such as land abandonment, natural succession and the impact of land management practices, at first intensification of practices. The novelty of the study is demonstration of climate change mitigation and forested area management tools as a factor to achieve biodiversity conservation aims of strictly protected areas. Forest changes are driven by socio-economic, policy, and environmental factors requiring targeted policies, such as sustainable forestry practices.



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3262 - Vulnerability And Adaptive Capacity Of Population And Settlements To Earthquakes In The Black Sea Basin. Case Study The Vrancea Seismogenic Area

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The Black Sea Basin (BSB) spans Southeastern Europe and Northwestern Asia, including Armenia, Bulgaria, Georgia, Greece, Romania, Russia, Turkey and Ukraine. It is a complex and dynamic seismotectonic region. While some areas are relatively aseismic, surrounding zones are affected by both shallow and intermediate-depth earthquakes, posing significant risks to densely populated coastal and inland regions (Papadopoulos et al., 2011, Diaconescu et al, 2020). Urbanized areas such as Kentriki Makedonia and Istanbul contrast with sparsely populated regions like TR82 (Kastamonu, Çankiri, Sinop), Anatoliki Makedonia Thraki, Moldova, and parts of Ukraine.

This study examines the vulnerability and adaptive capacity of populations and settlements to earthquakes across the BSB, with a focus on the Vrancea Seismogenic Area, a major intermediate-depth seismic source in Europe. Vrancea earthquakes have wide spatial impacts, affecting regions hundreds of kilometres away and causing significant socio-economic losses. Historical events, especially the 1977 Vrancea earthquake, highlight the region's destructive potential, causing building collapse, casualties, and long-term economic damage. Scenario-based modeling shows that earthquakes of similar magnitude can produce different impacts depending on local conditions.

The study applies a multi-dimensional framework, integrating exposure (population and built environment), sensitivity (structural fragility and socio-economic conditions), and adaptive capacity (institutional preparedness, infrastructure, and access to services). The analysis is based on harmonized statistical and GIS data, ensuring cross-border comparability.

Results reveal strong regional disparities in vulnerability and adaptive capacity, driven by socio-economic inequalities, urban-rural differences, and infrastructure gaps. Enhancing resilience requires integrated, transnational approaches focused on risk-informed spatial planning, improved building standards, effective emergency response, and public awareness. The study builds on interdisciplinary research within the Interreg NEXT BSB Project - Strengthening and Promoting Earthquake Emergency Response and Rescue Capacity in the BSB Area (SPEER-A) and promotes the use of open-source geospatial tools and education to strengthen earthquake resilience.

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C24.30-Land Use and Land Cover Change => Pathways to Sustainable Land Use and Land Management in the Climate Change Context - Integrated Data, Tools and Strategies



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1237 - Gap Analysis Of Climate Change Adaptation Governance In Island Territories Land Use Planning Challenges In Kinmen Taiwan

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Island territories often experience disproportionate climate risks due to limited land resources, coastal exposure, and constrained governance capacity. Although national climate change adaptation frameworks increasingly emphasize sustainability and resilience, their translation into inclusive and effective local land-use planning remains uneven, particularly in peripheral island regions. This study hypothesizes that significant governance gaps between national adaptation policies and local land-use practices contribute to unequal adaptation capacities in island territories.

This study employs gap analysis as the primary methodological approach to examine mismatches between policy intentions and implementation outcomes. Two key policy documents were analyzed: Taiwan's Land-Use Sector Climate Change Adaptation Action Plan and the Kinmen County Climate Change Adaptation Implementation Plan. Focusing on Kinmen as a peripheral island territory, the analysis evaluates gaps across three dimensions: (1) climate risk assessments versus land-use planning instruments, (2) adaptation objectives versus regulatory and zoning mechanisms, and (3) cross-sectoral coordination versus local governance capacity. Qualitative document analysis was complemented by spatial and institutional interpretation.

The findings reveal four major governance gaps: (1) scale mismatches between national climate risk frameworks and island-level spatial planning; (2) limited integration of risk-informed land-use controls in coastal and low-lying areas; (3) weak coordination between land-use planning, water management, and ecosystem-based adaptation measures; and (4) institutional fragmentation that constrains inclusive and context-sensitive implementation at the local level.

This study demonstrates that gap analysis provides an effective diagnostic tool for identifying structural constraints on climate change adaptation in island territories. The results highlight how governance gaps shape unequal adaptation capacities, reinforcing broader developmental disparities between core and peripheral regions. Addressing these gaps is essential for advancing sustainable and inclusive futures through climate-sensitive land-use governance in island contexts.



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2100 - Uav Based Strategies For Long Term Monitoring And Management Of Expansive Plant Species In Protected Mountain Landscapes Under Climate Change

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Background / Hypothesis

Sustainable land use and land management in protected mountain areas are key components of climate change adaptation and biodiversity conservation policies. A major and increasing land-use pressure is the expansion of invasive and expansive plant species, which can transform species-rich mountain meadows into monodominant stands and compromise long-term conservation objectives. Early detection and continuous monitoring of these processes are essential for adaptive management. We hypothesize that a UAV-based monitoring framework, co-developed with land managers and landowners, can provide an operational methodology suitable for long-term application in protected areas.

Materials and Methods

We developed an integrated monitoring framework based on ultra-high-resolution unmanned aerial system (UAS) imagery, field observations, and deep learning analysis. The methodology was designed and tested in close cooperation with the administration of Krkonoše National Park and with private and institutional landowners managing mountain meadows within protected landscapes. Continuous dialogue with stakeholders ensured that management needs, practical constraints, and policy objectives were incorporated into the methodological design. UAV imagery with centimetre-level spatial resolution was processed using convolutional neural networks (U-Net and DeepLabV3). Ensemble modelling, per-pixel agreement metrics, and spatial hot-spot analysis were applied to reduce uncertainty and generate management-relevant outputs.

Results

The framework delivers spatially explicit maps with accuracy between 80-95 % identifying priority areas for intervention and supports consistent comparison of expansive species dynamics across sites and time periods. The outputs are directly applicable for long-term monitoring, management planning, and evaluation of control measures implemented by national park authorities and landowners.

Conclusions

The proposed methodology provides a transferable, management-oriented tool for protected area administrations and landowners who share a common interest in controlling invasive species and safeguarding biodiversity and sustainability of valuable mountain landscapes. By integrating scientific tools with stakeholder collaboration, the approach supports evidence-based conservation strategies, adaptive management, and long-term protection of ecologically valuable areas under changing climate and land-use conditions.



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2308 - Challenges To Climate Change Adaptation Among Farmers In The Brăila Plain Romania

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Agriculture is an economic sector directly influenced by climatic conditions, thus any change in the climate patterns will have direct effects on it. The Southern Plain (Danube Plain) of Romania, the main agricultural region in the country, well known for high productivity of soils and good crop yields, is highly exposed to drought-related phenomena and extreme weather events, likely to severely experience the consequences of climate change. The most common already observed changes affecting agriculture in the region are the negative effects of scarce water availability for crops, with reduced yields, especially in non-irrigated regions, combined with specific socio-economic and political aspects that make some categories of farms vulnerable to these consequences.

The study aims to analyse the context for climate change adaptations of farmers in the Braila Plain looking at farms' typology, farmers' land management decisions and exploring how these decisions are oriented towards sustainable land management practices to promote better climate resilience.

The analysis used both quantitative and qualitative methods. It aims to analyse spatial field-level land-use data from the Integrated Administration and Control System (IACS) to derive information on farmers' land management decisions and the effectiveness of current agricultural policies. Also, by using participatory approaches, it will give deeper insights into the spatial data by presenting the results of the interviews with farmers and experts from relevant institution in the region, with focus on specific challenges related to land management and climate adaptation.

An important outcome of the study is to outline the difference noticed in terms of adaptive capacity between the large farms with a high adaptive capacity and low subsistence farms (family-run farms), the most vulnerable category to both socio-economic and climate change. The main climate adaptation measure considered crucial by the farmers is the rehabilitation/construction of irrigation systems.

The study provides useful insights which could improve the understanding of farmers and decision-makers on the potential impacts of the future climate change on agricultural land, on the factors influencing the adoption of agri-environmental measures and barriers to their implementation, but also to guidance to mainstream climate adaptation actions in the agriculture policy.



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2325 - Agroecology Nature Conservation And Climate Change A Study Of Family Farming In The Buffer Zone Of The Serra Do Mar State Park Itariru Unit São Paulo Brazil

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Food systems occupy a central position in contemporary climate change debates, as they simultaneously contribute to greenhouse gas emissions and are highly vulnerable to climate impacts. This study presents partial results from a transdisciplinary research project that examines the relationship between family farmers and environmental conservation arising from the integration of perennial crops, trees, and agroforestry systems as strategies for climate adaptation, mitigation, and biodiversity conservation.

The research was conducted in the Buffer Zone of the Serra do Mar State Park (PESM), Itariru Unit, and involved family farmers who are beneficiaries of the Atlantic Forest Connection Project, an initiative funded by the Global Environment Facility (GEF) and the Inter-American Development Bank (IDB). The project aims to implement Payment for Environmental Services (PES) mechanisms and promote sustainable agricultural practices.

Data were collected using the TAPE and SHARP tools developed by the Food and Agriculture Organization (FAO). A total of 30 farming households were surveyed in the municipalities of Peruíbe, Itariri, Pedro de Toledo, and Miracatu, São Paulo State, Brazil. The sample includes conventional farmers, farmers transitioning to agroecology, and established agroecological farmers, reflecting socio-productive heterogeneity. Many participants are also involved in rural social movements, cooperatives, local marketing networks, and women's organizations.

The results indicate that most farms maintain areas of conserved natural vegetation and high tree species diversity integrated into production areas. More than 80% of soil surfaces are covered by crop residues or intercropped species, and the vast majority of farmers do not use chemical fertilizers or pesticides. Women farmers play a strategic role in managing diversified systems and sustaining local agroecological networks, which are essential for consolidating policy-driven transformations.

Overall, the Atlantic Forest Connection Project can be considered a pioneering and effective initiative, generating benefits primarily related to enhanced access to information, agroecological knowledge, and productive diversification.



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2714 - Land Use Change And Governance Influence On The Steppe Ecosystem Of Castro Verde Biosphere Reserve (portugal)

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Castro Verde (southern Portugal) has a long-established agropastoral landscape shaped by dry cereal cultivation, fallow rotations and livestock grazing, modelled by specific policies, altogether sustaining one of the most important and recognizable landscape system in Europe. In this study, we aimed to examine land-use changes in the Castro Verde Biosphere Reserve and their implications for steppe biodiversity and sustainable governance. Using spatial land-use data from 1995 to 2023 and semi-structured interviews with key stakeholders, we analysed how agricultural practices and land-use have evolved under the influence of agricultural and environmental policies, including local agri-environmental schemes, the Natura 2000 framework and the designation of the territory as a UNESCO Biosphere Reserve, in 2017. Results show that, while agricultural landscape has dominated the territory over the years, gradual shifts towards more agropastoral systems have occurred, closely linked to the historical context, policy incentives and climatic constraints. Stakeholders' perspectives emphasize the importance of the European Common Agricultural Policy (CAP) in shaping land-use decisions and consequent outcomes, recognizing the importance of conserving endangered biodiversity and ecosystems. These dynamics have direct implications for steppe biodiversity and highlight pathways towards more resilient and adaptive governance within Biosphere Reserves. Therefore, our findings illustrate how Biosphere Reserves can foster integrated governance that harmonizes agricultural sustainability with biodiversity conservation, supporting resilient landscapes and the delivery of Nature's Contributions to People.



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2786 - Impact Of Barren Land Based Solar Farms On Local Climate In Arid Regions A Case Of Bikaner District Of Rajasthan India

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Large-scale solar photovoltaic (PV) farms are a cornerstone of the global transition toward sustainable energy, particularly in tropical regions where energy demands are surging. Arid and semi-arid barren lands are often considered the most suitable sites for these massive installations due to their high irradiance and low competition for land use. As the world's third-largest energy consumer, India has seen its power requirements multiply over the last decade. The Thar Desert in Western Rajasthan provides a vast expanse of barren land perfectly suited for solar development. Consequently, Rajasthan ranks first among Indian states in solar energy, boasting an installed capacity of 22,860.73 MW. With approximately 325 sunny days per year, the state offers ideal conditions for large-scale generation. The Bhadla Solar Park is a solar power plant located in the Bikaner District of the Thar Desert of Rajasthan, India. It covers an area of 56 square kilometers and has a total installed capacity of 2,245 megawatts (MW), making it India's largest and the 11th-largest solar park in the world as of 2024. The study uses Landsat satellite data along with the air temperature data recorded by the Indian Meteorological Department for last one decade to map the changes in temperature pattern around the solar farm. The study also compares the temperature patterns with small scale solar farms located in the arid, semi-arid and sub-humid regions. The results of study on air temperature demonstrated a distinct pattern of daytime warming and nighttime cooling, ranging from 0.1 to 0.5 °C. The most pronounced warming effect was observed during the summer season. The warming effect is more pronounced in arid region compared to semi-arid and sub-humid regions. Large scale afforestation in the surroundings is suggested to mitigate the heating effect of large scale solar farms in arid regions.



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3222 - Dynamic Identification And Zoning Of Conservation Based National Park In Response To Future Territorial Spatial Evolution A Case Study In China

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National parks represent a critical category of ecological conservation areas. However, static assessments often overlook the evolving reality. Beyond climate-induced ecological shifts, the reduced transportation costs and strengthened agglomeration forces from modern infrastructure intensify the dynamic competition between urban and ecological spaces. Therefore, integrating future territorial spatial evolution into the identification process is essential for effectiveness and accuracy. This study develops a future-oriented identification framework based on spatial economics. A high-resolution national land use simulation is conducted using the Patch generating Land Use Simulation model (PLUS), integrating Random Forest Classification (RFC) with a Cellular Automata Model based on Multiple Random Seeds (CARS). Then, this research simulated territorial evolution under four scenarios: baseline, ecological priority, agricultural priority, and climate change. A multidimensional index system was constructed to categorize national parks into wilderness-oriented, recreation-oriented, ecology-oriented, and heritage-oriented types. Results indicate that wilderness parks are concentrated in western regions like the Kunlun Mountains; recreation parks are located at wilderness peripheries with high accessibility; ecology parks show consistent patterns across key functional zones like the Qinghai-Tibet Plateau; and heritage parks remain spatially stable driven by resource endowment. This study offers a future-oriented identification framework, combining functional classification with spatial operability, providing scientific and practical support for enhancing China's protected area system.



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C24.33-Local and Regional Development => Border Regions and Communities: Reconceptualization in the Face of New Global Challenges and Crises



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1692 - Territorial Patterns Of Polish–ukrainian Relations In A Time Of Crisis

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Russia's aggression against Ukraine, the prospective EU membership of Ukraine and global trade wars have not only a geopolitical but also a territorial dimension. Their consequences are primarily reflected in changing intensities and structures of interactions and flows. As noted by Castells (1998), the space in which we live can no longer be understood as a collection of places, but rather as a system of multidirectional connections. Similarly, Domański (1996) emphasised that regional development depends to a large extent on regions' capacity to interact with their socio-economic and natural environments. Polish–Ukrainian relations provide an empirical example of how geopolitical processes reshape spatial configurations of socio-economic linkages. In this context, it is possible to assess how crises and external shocks affect the geographical dimension of these relations (Komornicki et al. 2026).

The presentation examines the territorial distribution of selected types of bilateral flows, including migration, tourism and foreign trade, analysed at the level of counties (LAU1). The analysis also draws on GSM mobile phone data. For 380 counties in Poland, indicators of intensity, dynamics and balance of flows with Ukraine were calculated. The results show that the territorial patterns of linkages are stable, while their structural composition is more sensitive to external shocks. Particular attention is paid to areas located along the Polish–Ukrainian border. Their resilience proved to be relatively lower: they did not become centres of intensive social interactions, as Ukrainian refugees gradually moved further into Poland and Europe. At the same time, some border localities remained areas of relatively strong economic linkages.

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1747 - From Coexistence To Confrontation Reconceptualizing Community Identity And Security At The Finnish–russian Border

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The Finnish–Russian border has long functioned as a symbolic and material frontier where competing narratives of Europe are negotiated and contested. Since Russia’s full-scale invasion of Ukraine in February 2022, this border has transformed from a site of pragmatic coexistence and lively cross-border mobility into a hard line of geopolitical tension and cultural division. As border communities stand at the first line of contact with global challenges, this paper examines how borderland residents in Finland experience and articulate their belonging and Europeaness amid heightened uncertainty, security pressures, and contested narratives of inclusion. The study reveals both resilience and ambivalence among border communities navigating the consequences of geopolitical crisis. While the hardened border now reinforces identification with the European Union and broader security frameworks, it simultaneously revives older stereotypes and anxieties that complicate such attachment. The war-induced climate has intensified everyday experiences of exclusion, as minority protection increasingly collides with national security imperatives. Border landscapes, previously understood as zones of contact and shared heritage, are increasingly reimagined as markers of vulnerability and exclusion. By foregrounding the voices of borderlanders, this paper demonstrates how global crises reshape perceptions of European belonging and democratic accommodation of diversity at the local level. Rather than viewing borderlands as vulnerable peripheries, the analysis reveals how proximity to threat vectors grants these communities unique experiential knowledge essential for understanding resilience as transformative capacity. The Finnish–Russian border crystallises wider tensions between security and openness, revealing how phantom borders resurface through lived experience. The paper contributes to reconceptualising border regions by arguing for narrative approaches that account for uncertainty and everyday experience in developing adaptive governance systems.



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1769 - Border Communities Of Ukraine Under Russian Aggression Rise And Decline Dimension

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The problems of border area development remain relevant for many countries, even when it comes to fairly transparent borders between them within the EU. These problems are even more relevant for post-Soviet countries, in particular Ukraine. For a long time, the development of border areas in the west and east of the country was uneven, with quite different levels of cross-border cooperation on the border with Russia and Belarus and with European countries which had joined the EU – Poland, Slovakia, Hungary, and Romania. Significant changes also took place in 2014-2015 with the start of Ukraine's active integration into the EU and the signing of the Association Agreement. At the same time, the country underwent a reform of decentralization of power, as a result of which communities received new powers and were able to join international cooperation on a new basis. At the same time, global challenges caused by the full-scale Russian aggression in 2022 led to the complete loss of transit potential of regions and communities in the east and north of Ukraine and the emergence of new functions by territories in its west.

The study, the results of which will be presented, is based on an indicative and perceptual assessment of the development of border communities in wartime and covers social, economic, and environmental components, as well as a section on infrastructure and accessibility. The main factors that, according to local residents, led to the deepening of spatial injustice after Russia's full-scale invasion are outlined. Differences in the assessments of spatial justice by residents of different regions (in terms of communities) have been identified. The characteristics of socio-economic and demographic changes in border communities have been determined.



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2038 - Socio Economic Transformation Of The Ukrainian Hungarian Border Region During The Russia Ukraine War

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The full-scale Russian military invasion has profoundly transformed everyday life in Transcarpathia, the westernmost county of Ukraine. Probably tens of thousands of ethnic Hungarians and other local residents have left their homeland, most of whom resettled in Hungary as Hungarian citizens, taking advantage of Hungary's preferential naturalization policy. The appearance of the Transcarpathian population on the Hungarian side of the border – an area otherwise considered a peripheral region severely affected by outmigration – represents one of the most significant social processes, dynamically revitalizing the region in numerous respects.

At the same time, on the Ukrainian side of the border, hundreds of thousands of internally displaced persons (IDPs) and nearly 400 relocated companies from war-torn territories have found refuge in Transcarpathia, which is widely regarded as the safest region in the country. These developments have had a profound impact on ethnic dynamics and economic conditions in the oblast.

The main goal of the present research is to examine how war-induced mobility practices have transformed the Ukrainian–Hungarian border region and to explore how these processes have reshaped social, ethnic, and economic relations in the investigated area.

Drawing on mixed-methods field research, the study demonstrates that many Transcarpathian families have purchased real estate in Hungary's northeastern periphery in order to establish second homes as a safeguard, a trend already observable after 2014. Following 2022, however, many of these second homes have become primary residences. The investigation also finds that cross-border living strategies, previously based in Transcarpathia, have now shifted to Hungary, causing significant changes on both sides of the border. On the Ukrainian side, particularly in urban areas, the proportion of the Hungarian population has declined, while the concentration of IDPs in these settlements has contributed to substantial demographic changes.



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2284 - Alternative Perspectives Front To The Socio Natural Vulnerabilities Of Climate Change In Latin America And The Caribbean New Geographies From Veracruz (gulf Of Mexico)

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In the Sierra de Santa Marta, one of the two volcanic massifs that make up the Los Tuxtlas region in southeastern Veracruz state (Mexico), located on the Gulf of Mexico coast, in the northeastern corner of Mesoamerica, processes of sustained maldevelopment/"sustained underdevelopment"—a concept referring to paternalistic and developmentalist public policies—prevail, devastating the socio-natural environment. Thus, poverty, human pressure on natural resources, social vulnerability, climate change, and consequently, rural emigration of the local population are phenomena of great geographical significance. Therefore, it is urgent to find socio-territorial alternatives that contribute to improving the precarious reality of the local peasant communities, both indigenous—Nahua and Popoluca—and mestizo. Consequently, the objective of this research is to present the potential of holistic regional socio-environmental governance to this end. With this purpose, from a transdisciplinary decolonial perspective (Geography, Anthropology, Environmental History and Intercultural Higher Education), qualitative methodology (bibliographic review, participant observation, open and semi-structured interviews, geographical analysis and cartographic representations), five non-governmental projects of natural resource management and agro-silvo-pastoral interventions in the region are analysed, linked to the principles of Mexican Social Environmentalism, the Epistemologies of the South, the New Geographies and Other Territorialities. These participatory and intercultural initiatives with the local communities foster socio-ecological practices and eco-social processes with a focus on integral sustainability (socio-ecological, socio-economic, socio-cultural, and socio-educational). Based on the methodological approach described, it has been observed that, in the face of maldevelopment and climate change, and beyond economic growth and mitigation, these emerging eco-cultural experiences help to reforest the territory, reduce poverty, decrease social vulnerability, and empower rural communities, with a gender dimension; generating progress towards a more humane development of the territories and rural populations of the Global South; and with the potential to be replicated as alternatives in developed countries of the Global North.



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2314 - Religious Diversity And Electoral Preferences In The Polish Part Of Cieszyn Silesia

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Background

Cieszyn Silesia is a historical region that has been divided by the national border between Poland and Czechoslovakia (the Czech Republic) since 1920. An important phenomenon in its Polish part, even before this division, was the popularity of the Silesian People's Party, which proclaimed that the local inhabitants – Polish-speaking Silesians – were not Poles, but a separate people, more closely related to Germans or Czechs than to Poles.

Later, despite belonging to Poland, no separatist tendencies were observed in this region. Admittedly, activists have recently appeared in Polish and Czech Silesia, proclaiming the existence of a separate Silesian nation, but as the results of recent censuses (e.g. 2021) show, support for this idea is low in the Polish part of Cieszyn Silesia. This is also true among local Protestants.

Hypothesis

This raises the question of whether religious differences still play a role in shaping the political attitudes of the region's inhabitants? Despite the victory of Polish national identity among the local population, are there any differences between the Protestant and Catholic populations?

Materials and methods

It was decided to answer this research question by analysing the results of general election in this region and comparing them with religious diversity. The analysis was based on the lowest administrative units, i.e. villages and towns.

Results

The results of the analysis suggest that Protestant voters are more likely than Catholics to vote for liberal and left-wing parties.

Conclusions

Religion in Cieszyn Silesia still plays a role in shaping voters' political sympathies, but this occurs within the context of a dominant Polish national identity.



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2512 - The Evolving Profile Of Cross Border Commuters In Lorraine Region (france) To Luxembourg

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Background

This proposal investigates the evolving patterns of cross-border employment between France's Lorraine region and Luxembourg, shaped and facilitated by Schengen mobility and Luxembourg's finance-driven, liberal economic model. The country's central location and post-2008 resilience have made it a magnet for cross-border workers, especially from regions surrounding Belgium, Germany, and France.

Materials and methods

By examining census microdata from France, this original research investigates modifications in commuting profiles between 2012 and 2022. Based on descriptive statistics and contrasting logistic regressions, the results show along with an analysis of cross-border working patterns among French residents. We have chosen the following characteristics available in the dataset at a micro-level: sociodemographic factors, education level, family situation, commuting patterns, residence type, distance from the border, and recent internal or international migration (if so). The objective aims to identify exogenous changes driven by regional challenges, such as the COVID-19 pandemic and the difficulty of finding work, and to explore how these pressures reshape border regions. The generational approach (e.g., boomers, X, Y) will facilitate the analysis of challenges and developments in the cross-border work among younger generations.

Results

We expect that there will be more male commuters, and the proportion of young workers will slightly decrease. Young people are increasingly pursuing higher education, or looking for jobs with better working conditions. Contextual constraints, including road and rail congestion, especially for cross-border commuters, emerge as significant deterrents to cross-border mobility. Additionally, the analysis highlights the impact of socio-economic and demographic shifts resulting from internal and international migration, which are reshaping both populations and territories.

Conclusion

This study shows how global challenges and transnational mobility policies are transforming labour practices and territorial dynamics, prompting a reconsideration of the role of borders in economic and social integration. The study contributes to ongoing debates on the adaptability of border regions in the lens of evolving migratory and economic landscapes.



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C24.33-Local and Regional Development => Changing Role of Borders in Local and Regional Development



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1638 - Glocal Operations And Challenges Of Global Niche Firms In The Post Covid 19 Era A Case Study In Shikoku Japan

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This study examines glocal strategies of global niche firms—mostly small- and medium-sized firms playing a critical role in the local economy—in the post-COVID-19 era through a case study in Shikoku, Japan. It has been reported that the COVID-19 seriously affected the businesses throughout the world. In Japan, local and international businesses in a variety of industries from agriculture and manufacturing to services suffered due to disturbance of distribution networks over three years from early 2020. However, it is not fully investigated in the literature in economic geography about how local firms have dealt with the challenges during and after the COVID-19. Based on the field survey in Shikoku and overseas, and secondary data published by the state and local institutions, this study tries to elucidate survival strategies of small- and medium-sized firms located outside of the large metropolitan regions through a case study of global niche firms based in Shikoku, Japan. The study has found that case study firms in Shikoku have survived the economic turbulence due to the pandemic in the flexible fashion and succeeded in continuing and expanding their businesses in the post-COVID-19 era. The key has been appropriate management of business operations through securing intra- and inter-firm relations with active operation strategies beyond borders.



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1754 - Changing Administrative Border Effects Under Regional Coordination In The Beijing Tianjin Hebei Capital Region Of China

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Background/Hypothesis:

Administrative borders can impede factor mobility and reinforce uneven local development. In China's capital region, the Beijing Tianjin Hebei Coordinated Development Strategy aims to reduce cross-jurisdictional frictions and promote integrated infrastructure and industrial reallocation. We hypothesize that development discontinuities across the Beijing–Hebei and Tianjin–Hebei borders declined after 2014, particularly where cross-border accessibility improved, and that firm entry patterns shifted accordingly.

Materials and methods

We combine harmonized 2010 to 2020 gridded per capita economic activity with geocoded newly registered firms to construct county-year outcomes for relative development and within-county inequality. Border county pairs straddling the provincial boundaries are matched to comparable interior pairs using pre-2014 characteristics. A difference-in-differences design with county and year fixed effects estimates post-2014 changes in border gaps, and an event-study specification tests pre-trends and dynamic responses.

Results:

Substantial pre-2014 border gaps are observed in both development level and firm entry intensity. After 2014, border gaps narrow more strongly in segments experiencing larger accessibility gains. Manufacturing-type entry increases on the less-developed side of the border, while producer services remain concentrated closer to metropolitan cores. Several border counties exhibit rising within-county inequality during periods of rapid growth, indicating uneven local distribution of integration benefits.

Conclusions:

In the Beijing Tianjin Hebei capital region, administrative borders remain development-relevant but are becoming more permeable under regional coordination. Targeted cross-border infrastructure, joint planning, and inclusive support for border towns can strengthen convergence while mitigating local polarization.



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1958 - Territorial Development And Socio Economic Drivers Of Cross Border Mobility In The Romania Hungary Border Region

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Cross-border regions are highly sensitive and vulnerable, with identities shaped by the interplay of specific ethnic, cultural, geographical, historical, economic, demographic, and political factors that have, over time, either facilitated or constrained cross-border flows. The Romania-Hungary border extends over a total length of 448 km, accounting for 14.0% of Romania's total border length and 21.3% of Hungary's. The border region comprises eight counties with varying socio-economic development levels: Satu Mare, Bihor, Arad, and Timiș in Romania, and Szabolcs-Szatmár-Bereg, Hajdú-Bihar, Békés, and Csongrád-Csanád in Hungary, the cross-border connectivity being ensured through 18 border crossing points.

The aim of this study is to identify current patterns of socio-economic development and to assess territorial development levels at the NUTS 3/5 scale as drivers of cross-border mobility, by computing and correlating the Index of Territorial Development (ITD). To this end, 20 indicators were selected across key domains, including demography, labour market, housing, public utilities, healthcare, education, tourism and culture, connectivity/accessibility, and environmental conditions. The analysis is based on the statistical data (2024) provided by the National Institutes of Statistics of Romania and Hungary.

By linking territorial development levels with mobility patterns, the study highlights how development asymmetries, accessibility gaps, and service availability act as both push and pull factors across the border. Assessing territorial development in the Romania-Hungary border region thus represents a necessary step in identifying less developed socio-economic sectors, vulnerable urban and rural areas, and border segments where limited development constrains cross-border mobility. These findings provide a basis for targeted interventions by regional, national, and local authorities, supporting more balanced territorial development and strengthening of functional cross-border integration.

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2157 - Patterns Of Cross Border Cooperation Evidence From Poland's Border Regions

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Border regions possess distinctive characteristics in the development of cooperative relationships, shaped by the interaction of international and national conditions at central, regional, and local levels. The presence of the border itself plays a significant role as a barrier across multiple dimensions, including spatial, administrative, economic, and socio-cultural. Within this context, both the initiation and continuation of cooperation are critical processes. Despite its importance, cross-border cooperation has rarely been examined in depth, particularly from the perspective of the actors involved.

The aim of this study is to identify patterns of cross-border cooperation within Poland's borderlands. The specific objectives are as follows:

- to examine approaches to forming project consortia and methods of defining project scope;
- to identify the rationale for continuing or discontinuing cooperation beyond the initial project phase.

This article is situated within the broader field of cooperation studies, focusing on cross-border collaboration in the framework of multi-level governance. Accordingly, the analysis encompasses local government units (including their organisational entities), which account for the majority of organisations engaged in such cooperation (approximately 70%).

The spatial scope of the research includes Poland's internal borders within the EU and the Schengen Area (with Germany, the Czech Republic, Slovakia, and Lithuania) as well as its external borders (with Ukraine, Belarus, and Russia).

The study is based on qualitative research employing content analysis to identify themes and patterns emerging from in-depth interviews. Twenty-four semi-structured interviews were conducted with selected organisations in Poland and neighbouring countries. Key elements of the cooperation patterns examined include the presence or absence of prior collaboration, strategies for creating project consortia under the Interreg programme, and the extent to which cooperation continued following project completion.



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2569 - The Daily Experience Of ‘open At The First Line Controlled At The Second Line’—the Emotional Perception And Identity Of Macao Residents In Cross Border Crossing

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Hengqin is the most mature and tangible pilot experiment zone that connects Macao SAR and mainland China. This study focuses on Macao residents’ daily cross-border customs experience in the Guangdong-Macao In-depth Cooperation Zone in Hengqin, exploring how the “first-tier opening, second-tier management” customs policy—manifested through technological infrastructure, discursive narratives, and affective perceptions—shapes their sense of regional integration and identity. Against the backdrop of Hengqin’s underdeveloped population aggregation despite institutional support, this research addresses the gap in studies on the intermediate emotional states of affective infrastructure and bottom-up non-state discourses. Drawing on Larkin’s three-dimensional framework (technological, discursive, affective) and Fairclough’s critical discourse analysis (CDA), the study adopts a qualitative approach combining CDA and semi-structured interviews. Technologically, it examines how customs facilities (e.g., inspection processes, transportation connections) and their practical utility (time/cost efficiency) influence mobility frequency. Discursively, it contrasts official narratives of “convenient cross-border integration” with residents’ perceived gaps in policy implementation. Affectively, it uncovers mixed emotions (e.g., expectation vs. disappointment, familiarity vs. alienation) triggered by the disjuncture between policy rhetoric and daily practice. Additionally, the research investigates how uneven power dynamics in customs management (e.g., preferential inspection for Macao residents) reinforce or blur identity boundaries. By engaging Macao residents with diverse mobility patterns (daily commuters, weekend visitors), the study aims to reveal the micro-mechanisms by which border infrastructure mediates regional integration. Empirically, it supplements insights into the “affective failure” of cross-border infrastructure; theoretically, it enriches research on infrastructural regionalism by integrating bottom-up perspectives. Practically, findings can inform the optimization of customs and supporting facilities to enhance residents’ sense of belonging and promote Hengqin-Macao integration.



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3168 - From Fixed Borders To Relational Territories

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Administrative boundaries are often treated as fixed lines that define regions, governance, and identity. Yet rapid urban growth and rising mobility are making these lines less stable in practice. Daily movement, lived experience, and institutional reform do not always match official maps. Territorial space is therefore not only drawn by governments but also shaped by flows and by how people understand where they belong.

Drawing on several empirical studies from urban China, this research examines territorial change from three angles. First, large-scale mobility data show that functional urban regions often extend across formal administrative borders, creating blurred and overlapping areas of daily activity. Second, survey evidence indicates that residents' perceived urban boundaries frequently differ from official divisions, revealing a gap between administrative space and mental maps. Third, cases of administrative division change demonstrate that when formal boundaries are adjusted, residents' local identity and sense of belonging also shift, sometimes gradually and sometimes unevenly.

Taken together, these findings suggest that territorial boundaries are not simply fixed lines on a map. They are shaped by movement, perception, and institutional decisions. Understanding this layered process helps explain regional integration, boundary reform, and changing local identity in rapidly urbanizing contexts. This perspective contributes to ongoing debates on borders and regional development by highlighting the dynamic relationship between administrative structure and lived territorial experience.



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C24.33-Local and Regional Development => Rural-Urban Relationships and Development Challenges: Local and Regional Patterns of Territorial Change



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1014 - The Interface Between Agriculture And Urbanization A Case Study Of Bir Al Sika Village Israel

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This article examines the evolving interface between agriculture and urbanization in Arab communities in Israel through an in-depth case study of Bir al-Sika, a rural settlement in the Triangle region. The study investigates how, amid accelerated urbanization and demographic growth, local agricultural practices adapt to spatial, economic, and policy-driven pressures. Using a mixed-methods approach that combines historical GIS analysis of land use (1944–2023) with interviews of farmers and local officials, the research explores land use transformations, survival strategies, and stakeholder perspectives. Despite a national trend of agricultural decline, Bir al-Sika presents a unique case where urban expansion has largely spared agricultural land due to strategic construction on non-cultivable hilly areas. However, a transition is underway: while large farms persist and adopt modern technologies like greenhouses, most residents now engage in agriculture part-time or abandon it in favor of other income sources. Farmers face challenges such as land fragmentation, rising input costs, and limited institutional support. Officials generally advocate for preserving agriculture through infrastructural investment and zoning for industrial development to alleviate urban pressures. Farmers, however, express a preference for rezoning land to residential use, driven by economic considerations and concerns over land expropriation. The findings highlight the potential for sustainable agriculture in Arab localities when supported by thoughtful planning, infrastructure, and technology adoption. Bir al-Sika thus exemplifies a model of coexistence between urban development and agricultural preservation, offering valuable insights for similar rural-urban interfaces in marginalized communities.



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1070 - Development Opportunities Vs Development Outcomes In Small Cities Empirical Insights From Romania

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Small cities have been pinpointed to be the losers of the neoliberal policies of the last decades, both in Western and Eastern Europe. Although the trends and patterns are similar for the two parts of the continent, the context and the speed of changes have been dramatically different in Eastern Europe, including Romania. Our paper looks at the Romanian particular case by investigating 3 different aspects of urban fast changes throughout the last three decades. First, urban development has been assessed as development opportunity, i.e. as spatial accessibility of urban population to medical and educational services of general interest, as well as to the European Union market. Second, urban development has been assessed as development outcome, i.e. measured as educational, health and economic outcomes at urban level. Finally, characteristics of cities' neighboring rural areas have been investigated in order to explore the role of rural-urban interdependencis. A special consideration is given to the statistical interplay between urban development as outcome on the one hand, and particularities of surrounding rural areas and urban development opportunities on the other hand. Understanding the challenges and threats that small cities face in relation to their surrounding rural areas and the broader context is particularly important for defining efficient urban national policies.



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1216 - Embedded In Metropolitan Areas Centralization Pattern From Peripheral Multi Level Local Governance In The Pearl River Delta

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In the urbanization process shaped by China's reform and opening-up, two major metropolitan regions have gradually emerged in the Pearl River Delta (PRD), centering on Guangzhou and the Shenzhen–Hong Kong corridor.

While a distinct type of mixed urban–rural space has emerged in the wider peripheral areas, which have been shaped by the national dual land system and produced through the intertwined dynamics of top-down governmental initiatives and bottom-up actions of rural collectives. They are conceptualized as *desakota*, a term defined by T. G. McGee (1991) to describe settlement patterns in rapidly urbanizing Asian regions.

While confronted with strong village-level power and being structured by metropolitan center, multi-level local governments in these peripheral regions have proactively sought to embed the place into the metropolitan functional structure through centralization strategies.

Through participant observation and interview, we select the development strategies and implementation of Dongguan city and Nanhai district after the 2000s as typical cases, to reveal the centralization strategies, including: (1) Spatial Integration for “strategic functional zones” through top-down strategic and territorial planning; (2) Spatial Rescaling through functional zone reorganization and inter-governmental coordination; (3) “Institutional Thickness” creation by mobilizing fiscal tools, employing innovation policies, and factor coordination in specific area; (4) Proactive Formalization, transforming land practices from informal to formal regimes. Through these approaches, local governments actively construct “strategic functional zones,” creating functional centers and proactively embedding themselves within the metropolitan functional system.

The research seeks to explore the endogenous resilience of local governmental intervention in metropolitan-edge regions under the exogenous forces of regional centers, through examining how historicity, locality and planning embedding vividly enact in rural and regional development from the very local level. It contributes to understanding the agency and entrepreneurialism of local governments in China's peripheral areas and multi-level governance, and expands empirical insights into the study of regional patterns of territorial change in the global South.



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1351 - Spatial Construction For Building The Networked Metropolis Hangzhou's Experience To Tackle Urban Rural Imbalance Conflict

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The concept of urban–rural equivalence, originating in Germany, was developed in the 1960s to mitigate disparities between urban and rural development through planning instruments such as land consolidation. This framework closely aligns with China's contemporary objectives for urban–rural integration, which aim to reduce disparities in living standards by facilitating the smooth circulation of production factors and the efficient allocation of resources. It is widely acknowledged that promoting the free flow of capital, talent, and technology is essential for addressing structural contradictions between urban and rural areas in China. Since 2005, Hangzhou has implemented the city-regional networked metropolis strategy, leveraging optimized transportation systems and industrial restructuring to foster a pattern of coordinated regional development.

Building on the concept of urban–rural equivalence, this research examines the influence of Hangzhou's multi-centre and networked spatial structure on urban–rural integration. It provides a theoretical basis for dismantling barriers to factor mobility between urban and rural areas and for optimizing spatial organization. Furthermore, this study offers replicable and adaptable insights drawn from Hangzhou's experience, demonstrating how coordinated development can be achieved through principles of performance sharing and functional complementarity. It argues that, in order to promote the integration of urban and rural industries and the equalization of public services, the transportation-driven, multi-centre, and clustered urban configuration enhances spatial accessibility and facilitates the reorganization of innovation resources.



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1637 - Rethinking Development Equity In Belt And Road Mega Infrastructure Livelihood Resilience And Transformation In The China Laos Railway Corridor

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China's Belt and Road Initiative (BRI) has facilitated trans-regional connectivity through transnational infrastructure development. As a flagship BRI project in Southeast Asia, the China-Laos Railway has consolidated geo-economic linkages while fundamentally reconfiguring livelihood capital structures among riparian communities. This study advances the Sustainable Livelihoods Approach (SLA) by incorporating cultural capital, establishing a six-dimensional framework to interrogate how large-scale cross-border infrastructure investments shape livelihood resilience among Laotian populations and the underlying mechanisms. Drawing upon 569 surveys and 30 in-depth interviews in Vientiane and Luang Prabang (2025), the research employs integrated subjective-objective weighting, linear weighted aggregation, and variance analysis to quantify livelihood capital dimensions. Through ANOVA and fuzzy-set Qualitative Comparative Analysis (fsQCA), we identify differentiated resilience patterns and causal pathways, subsequently deploying Structural Equation Modeling (SEM) to elucidate mediation mechanisms. Three key findings emerge: First, economically-engaged cohorts demonstrate pronounced advantages in financial and physical capital through improved income, housing, and transportation accessibility. Socio-culturally engaged groups exhibit superior human and cultural capital, with linguistic and cross-cultural competencies serving as critical opportunity mediators. Non-participating groups remain peripheralized with deficient capital accumulation. Second, aggregate livelihood resilience registers at moderately low levels, manifesting robust buffering capacity yet fragile self-organization and adaptive learning. High resilience emerges through three pathways: endogenous accumulation of diversified capital; synergistic interaction among natural, financial, social, and cultural capital; and exogenous engagement with Chinese-funded projects. Third, external assistance operates through full mediation by enhancing multidimensional capabilities. Positioning Laos as an exemplary "landlocked" to "land-linked" transformation, this research illuminates micro-level livelihood implications of transnational railway infrastructure. It extends the SLA framework's cultural dimension through mixed-methods integration, bridging macro-developmental discourse with micro-livelihood realities. The findings offer empirical insights for reconciling economic imperatives with social development objectives within BRI infrastructure initiatives.



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1919 - The New Trend And Coping Strategies Of Regional Development Gap In China

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Regional development gap is an eternal research theme in economic geography. In the new stage of China's development, understanding the new trends and causes of regional development gap is the scientific basis for formulating targeted policies to promote coordinated regional development. It's found that the economic gap between coastal and inland regions has slowed down over the past decade, people's living standard gap has shown an expansion trend. The gap has comprehensive widened between regions of the same type in the north and south, such as between urban agglomerations and developing regions. The urban-rural gap has generally alleviated, but the circumstances are still larger in economic backward region. Border provinces' development in China has generally been ahead of neighboring countries. According to the reasons for the new trend of regional development gap, it puts forward policy suggestions for promoting coordinated development of region in the new era, which includes: in the near future, narrowing regional economic gap is as important as narrowing residents' living standard gap. Adapting to the expansion rule of north-south gap and stimulating the momentum of development in the south are conducive to basically achieve modernization in 2035. According to the deployment of fighting a protracted war, after eliminating absolute poverty, supporting the economic development in relatively poor areas should be taken as a key point of regional policy. Facing new challenges and adapting to new situations, it takes solving the new infrastructure as the main point, reverses the continuous expansion situation of regional innovation capabilities between economically developed and underdeveloped regions, and stimulates the contribution of innovation to the balanced development of regional economic.



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1981 - Spatial Identification And Zoning Of Rural Revitalization Clusters In Metropolitan Areas A Case Study Of Suzhou City

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Against the backdrop of urban-rural integration, the scientific identification of functional rural spaces is a fundamental task for optimizing territorial spatial governance and advancing rural revitalization. The traditional planning model, which relies on administrative villages as the basic unit, often struggles to effectively integrate resources, highlighting the urgent need to explore new spatial governance units based on functional linkages. This study, taking Suzhou City as a case study, constructs a “node-corridor-cluster” identification framework. By integrating multi-dimensional open data—including enterprise, population, Points of Interest (POI), road network, land use data, and the “three zones and three lines” spatial management boundaries—and comprehensively applying methods such as social network analysis, spatial interaction models, and constrained clustering algorithms, the research identifies growth nodes and linkage corridors, subsequently delineating rural revitalization clusters.

The study categorizes Suzhou’s rural territory into four functional zone types: Urban-Rural Integrated Zones adjacent to urban areas, Cultural-Tourism Synergistic Zones relying on ancient towns and landscapes, Specialized Agricultural Zones focused on efficient agriculture, and Ecological Conservation Zones that provide ecosystem services. These clusters exhibit a spatial pattern of “corridor-linked, clustered distribution,” significantly transcending the administrative boundaries of towns and sub-districts.

The research demonstrates that rural revitalization clusters identified through multi-source data and spatial models can objectively reveal the functional organizational patterns of rural regions. The proposed “cluster planning” paradigm can provide a scientific basis for county-level territorial spatial planning that transcends administrative units and focuses on functional synergy, offering methodological reference value for similar regions.



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2145 - The Spatial Decoupling Of Territorial Functions From Natural Carrying Capacity Creates Sustainability Risks In China

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Optimizing land use patterns based on natural carrying capacity is essential for global sustainability. China's Major Function Zoning Strategy aims to achieve this balance, but county-level data from 2010 to 2020 shows growing separation between land functions and natural conditions. This separation creates clear mismatches. Economic advantages draw people and industries to water-rich southern China, causing loss of good farmland to cities. At the same time, dry northern regions produce 68.68 percent of China's additional grain, and northern ecological areas, especially the Northeast Forest Belt, provide 86.10 percent of new protected land. Soil tests prove farmland lost in the south has better quality, especially higher organic carbon, than new farmland in the north. Income gaps between cities and conservation areas keep widening, reducing local willingness to protect ecosystems. Nationwide, land use changes are driven by economic gains. Southern hills replace forests with profitable crops, while northern regions rely on farming or government payments for conservation due to limited options. Current policies help but are not enough. Farmland protection slows urban expansion in the south, and conservation payments support the north. However, market pressures still cause poor land swaps that waste resources, weaken food supply chains across regions, and push northern ecosystems beyond their limits. Our results show balancing economic needs with long-term land health requires stronger payments for ecosystem services between regions.



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2484 - Smart Villages As A Response To Contemporary Rural Development Challenges Evidence From Poland

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The study aimed to analyse the concept of smart villages, understood both as a theoretical framework and as a development policy instrument. Its purpose was to verify the assumption that the smart village represents a new model of rural development, focused on improving quality of life through locally driven responses to identified challenges. The research applied several complementary methods. First, a critical literature review was conducted. Second, materials related to the smart villages instrument, including selected Common Agricultural Policy (CAP) strategic plans for 2023–2027, were examined to assess how the instrument is implemented. Third, empirical analyses used multidimensional comparative methods, enabling the construction of an ordinal classification and the identification of internal structures within a typology of rural areas. The study encompassed all rural and urban-rural municipalities in Poland (2,175 LAUs). The analysis covered both static (situation) and dynamic (change) perspectives for the years 2005–2021.

The findings indicate that the smart village instrument in the 2023–2027 CAP is embedded within the LEADER/CLLD approach. However, interventions in national strategic plans are generally vague and often lack dedicated funding. At the European Union level, the instrument is designed to address five major rural development challenges: demographic change, social activity, digitalisation, climate change, and development polarisation. Within this framework, the study identified 11 challenges specific to Polish rural areas. Their spatial distribution varies across both static and dynamic analyses. Most challenges follow a centre-periphery pattern, except for climate related issues, which depend primarily on natural conditions. The resulting typology demonstrates substantial diversity among rural areas, confirming that local development challenges differ significantly across regions and time periods.



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2513 - Urbanization And Suburbanization In Romania Shifting Rural–urban Dynamics And Regional Development Challenges

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This paper investigates the evolving dynamics of urbanization and suburbanization as central processes shaping Romania's rural-urban interactions, focusing on urban expansion, regional development challenges, and spatial inequalities, particularly in the post-1990 socio-economic context. Urban growth has led to increased demand for housing, transport, and infrastructure, often manifesting as urban sprawl in areas surrounding cities. This study provides a comprehensive regional analysis of these processes, integrating land use changes with service accessibility to highlight spatial inequalities across the country. Using CORINE Land Cover and Urban Atlas data, combined with census and spatial indicators, urban sprawl and (sub)urbanization trends are analyzed for each Development Region (NUTS 2 level) over multiple periods spanning over the 1990–2018 period. The research identifies intra- and inter-regional differences in built-up area expansion, showing that urban growth largely occurs at the expense of arable lands, pastures, and natural complex cultivation patterns. Suburbanization has intensified spatial inequalities in access to basic services such as healthcare, education, and public utilities, with urban centres remaining relatively well-equipped, while peripheral suburban areas face uneven development. The study underscores the interconnected environmental and socio-economic challenges of urban sprawl through urbanization and suburbanization, providing critical insights for regional planning, land management, and policy interventions aimed at balancing urban growth with equitable service accessibility.



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2634 - Public Policies Facing Depopulation An Exploratory Study In Castilla La Mancha Region (spain)

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Through bibliographic and documentary analysis, this study approaches the characterisation of public policies implemented over the last 40 years to counter depopulation in rural areas of Spain and Castile-La Mancha, concluding with an analysis of Law 2/2021 on Economic, Social and Tax Measures to Counter Depopulation and Encourage Rural Development in Castile-La Mancha.

We will focus on dynamics that reveal new forms of institutional and community capacity building. The policy of demographic challenge, development and territorial equity is complex due to the multitude of aspects with which it interacts and the heterogeneity of each territory. It therefore requires a multisectoral and multi-stakeholder approach. Inter-administrative collaboration, public-private cooperation and social participation are essential elements.

Based on this general framework, we have set ourselves the objective of an exploratory investigation of the initiatives to settle new residents in rural municipalities in Castilla-La Mancha (Spain) using a mixed methodology that combines the review of available information and the case study method as an alternative approach following qualitative methods. The objective is to identify and analyse socio-demographic impacts in several areas: demographic, economic, personal well-being, and local vibrancy.

Our aim is to compare, for a selection of case studies, the perceptions and assessments of both the administration and the social economy initiatives involved in the processes, as well as those of local communities and new settlers in the selected localities.



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2780 - The Scared Manimahesh Yatra Socio Cultural Tradition In The Pir Panjal Range Of Greater Himalaya In Chamba District Himachal Pradesh India

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The Manimahesh Yatra is a prominent pilgrimage of Himachal Pradesh, organised every year in the high-altitude terrain of the Pir-Panjal range in Chamba district. Pilgrims travel through the Bharmour–Hadsar corridor to reach the sacred Manimahesh Lake, a site deeply associated with local belief systems and wider Himalayan religious traditions. This paper explores the yatra as a living socio-cultural practice and highlights how faith-based mobility shapes both community life and the mountain landscape.

The paper focuses on three objectives: first, to understand the cultural and spiritual meanings linked with the Manimahesh sacred setting; second, to examine the role of local communities in supporting and participating in the pilgrimage; and third, to identify key issues related to crowd pressure, infrastructure limitations, and environmental sensitivity along the route.

The study is based on direct field observations during the pilgrimage season and qualitative interactions with pilgrims, residents, service providers (including pony operators and vendors), and concerned authorities. Secondary information from reports, local documentation, and academic writings is used to strengthen the analysis. Route mapping was also undertaken to identify major halting points and service zones.

The findings suggest that the yatra contributes to social cohesion and cultural continuity, while also generating seasonal income through transport, small-scale trade, and temporary tourism services. However, increasing participation has intensified waste disposal challenges, placed stress on fragile alpine ecosystems, and raised safety concerns in steep and landslide-prone sections. The paper concludes by emphasising the need for locally informed and environmentally responsible pilgrimage management that protects both sacred values and mountain sustainability.



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**C24.34-Marginalization, Globalization, and Regional
and Local Response => A New Era of Globalization?
Proposals to Reindustrialize the European Union,
Protectionism in the US, and Crisis in Global Supply
Chains.**



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1686 - The Globalization Of Chinese Cities Foundational Logic And Development Pathways

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The globalization of Chinese cities has been significantly shaped by market-oriented reforms and state-led initiatives. Since China's accession to WTO in the early 21st century, a growing number of Chinese cities have deepened their integration into the global urban network by actively participating in global value chains. Drawing on a comprehensive review of Chinese and international academic literature, this study synthesizes critical insights to propose key conclusions. Similar to Western urban globalization, the globalization of Chinese cities also exhibits a hierarchical nature, yet with a more pronounced state-driven governance structure. Cities holding higher political status at the national or regional level tend to globalize earlier and more intensively. While many Chinese cities—particularly those in central and western regions—still occupy peripheral roles in global value chains, non-top-tier cities such as Suzhou, Dongguan, Jinan, and Chengdu have achieved breakthroughs in global influence. Initially integrating into the global economic system through passive acceptance of FDI and undertaking outsourcing tasks, these cities successfully embedded themselves as integral components of the global value chains. Through this process, they achieved capability upgrading via international technology diffusion and localized innovation efforts. Today, they have transitioned from low-cost labor hubs to highly globalized network nodes in sectors such as finance, advanced manufacturing, and innovation. Moreover, their sustained proactive globalization strategies—epitomized by OFDI—are facilitating a transformation from latecomers to leaders across diverse specialized sectors in the global economy. Given China's vast regional development disparities, we must examine the phased differentiation and divergent pathways of urban globalization across regions. This presents a complex challenge, necessitating analysis through a three-dimensional interplay of central-state directives, local-government strategies, and corporate-driven dynamics. This has deeply embedded Chinese cities' globalization patterns in the complex dynamics of domestic geopolitical economy, shaped by conflicting interests and power struggles within the system.



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2468 - Emerging Global (re)shift Of Manufacturing & Supply Chains Amid The Us China Decoupling Empirical Assessment And Implications

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Emerging global (re)shift of manufacturing & supply chains amid the US-China decoupling: Empirical assessment and implications

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Abstract

This study explores how accelerated Geopolitical Risks (GPR) influence multinationals' spatial distribution of global supply chains and their manufacturing location strategies amid the US-China decoupling. Based on economic globalization, conventional studies of international manufacturing bases mainly focus on how multinationals exploit natural resources, pursue foreign markets, acquire strategic assets, and increase production efficiency to achieve competitive advantages. Yet, our empirical findings reveal that multinationals choose their global manufacturing locations during the US-China strategic rivalry based on their home country's political considerations and foreign policies. Following this, various US and EU multinational companies have reshored their production from China back home or re-offshored manufacturing activities from China to Southeast and South Asia, such as Vietnam and India, to mitigate the increase in GPR. Further, many Japanese and Canadian multinationals friend-shored their overseas production activities to the US as political and economic allies. In contrast to previous studies indicating the international supply chains notably shifted from Western regions to Asia (i.e., the first global shift), we assess that a grand global reversal and re-shift in manufacturing has emerged over the past decade. With the rising Sino-U.S. geopolitical tensions and the outbreak of the Russia-Ukraine war, we suggest that the states and multinationals prepare to manage supply chains effectively for any abrupt changes in the global political environment.



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C24.34-Marginalization, Globalization, and Regional and Local Response => Facing Marginality: Actors, Strategies, Policies and Social Responses



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1409 - Fragmentation As An Effect Of Marginalisation. The Case Of The Silesian Voivodeship

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The Silesian Voivodeship, as one of Poland's regions, is characterised by strong spatial polarisation. Progressive fragmentation leads to the separation of physical, social and economic landscapes. This division hinders the efficient use of resources and infrastructure, undermining efforts to achieve sustainable development in the region. In many places, it results in unequal access to services, commerce and public spaces, as well as increased transport needs and environmental degradation. This is a common challenge for the creation of cohesive and resilient urban and rural environments.

This phenomenon is characterised by sprawling forms of sparse built-up areas, gated residential communities and segregation of land use, leading to numerous social and environmental problems. They are dominated by spontaneous trends of development, not supportive to the process of metropolisation, hindering both integration processes and participation in the global civilisational game.

This trend leads to the fragmentation of urban structures and, in many cases, to their peripheralisation ('increasing distance from the centre') and/or marginalisation ('deterioration in quality of life and progressive social exclusion'), leading to an increase in internal migration. Historically stable trends of urban population growth are turning into persistent depopulation, with the emergence of decapitalised and neglected housing. Revitalisation is not keeping pace with the processes of decapitalisation – as a result, there is a progressive depreciation and fragmentation of urban and rural areas in the Silesian Voivodeship.

The main objective of the paper is to assess the marginalization/peripheralization of residential areas in the Silesian Voivodeship. The study used the Multi-Criteria Evaluation (MCE) method, where the natural breaks method (Jenks optimisation) was used to identify peripheral zones, recognising peripheral areas as those with the lowest MCE values. The calculations were performed using BDOT10k digital maps with Saga GIS and QGIS software, focusing on fuzzy values of distances from service, office and commercial facilities, as well as transport network elements.

As a result, areas with limited access to services and assets (mainly public) were identified. They appear as isolated points in central parts of cities, and as linear strips on the outskirts of urban agglomerations, indicating visible signs of peripheralisation and/or marginalisation in metropolitan areas.



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1821 - Marginalized Groups In Vulnerable Spaces In Rio De Janeiro Brazil

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Rio de Janeiro is known in the world for its stunning natural beauty, but also for its violence indicators, which reveal its gaping socio-spatial inequalities. Its favelas are a key aspect of this scenario. The favela residents are socially and environmentally vulnerable and also in terms of their access to adequate public services and amenities. In Rocinha, the biggest favela in Brazil, home to approximately 71,000 people, around 32% of whom are youth, and 10,000 are of school age, there are just three schools for the 6-to-14 age group and one for the 15-to-17 age group. This means that most of this group have to go to school outside the community, commuting every day, which not only takes up time in a city with severe urban mobility issues, but also exposes them to the risks of violence that permeate everyday life in a Rio favela. This needs to commute to school and the problems associated with it constitute an extra factor dragging down education levels in this segment of the population. In order to reflect on this problem, this paper presents some considerations about how public policies may address to these marginalized places and groups. What particularly interests us is to consider this question from the perspective of the challenges facing the promotion of education for youth that lives in favelas (around 25% of the favela population in Rio de Janeiro), considered as the main institutional means for social mobility. Assuring young people access to school is a matter of social justice, because people need knowledge, disciplinary knowledge, to engage in debate, to resolve problems, and to inform decisions in the societies in which they live. Indeed, school may be the only opportunity such youth have to acquire powerful knowledge, so essential for the promotion of social justice.



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1824 - Reinventing Marginality In The Metropolis Algorithmization Of Territory And Violent Sociability In Rio De Janeiro

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The problem of the algorithmization of urban territory presents the challenge of deciphering information and communication technologies in the daily lives of marginalized citizens living in contexts of violent sociability. Investigating this problem and addressing this challenge highlights the relevance of systematic knowledge about the urban condition of the present time, given the realization of territorial justice. Our central question concerns the escalation of oppressive spaces in Rio de Janeiro, linked to the imposition of the daily use of digital applications in the commutes of residents of places marked by pronounced socio-spatial marginality. These are the people who experience the flow of the metropolis as embodied subjects constrained and cornered by the degradation of social life, particularly in peripheral areas such as slums (favelas). Marginality is being reinvented in the metropolis. The backdrop to the public security crisis in the city is addressed from the point of view of i) factual factors, aiming at reducing crime, especially lethal violence; and ii) intersubjective factors, relating to reducing the fear generated by risky and dangerous situations, especially those caused by stigmatizing social representations. From a theoretical-conceptual standpoint, we address marginalized liminal spaces and the algorithmic ordering of the territory to highlight the advancement of platformized urbanism amidst socio-technical networks that envision a just city. We analyze the situation of the besieged metropolis, whose dynamics incite the use of digital resources such as the apps “Where There’s a Shootout” and “Crossfire” which record criminal occurrences inflicted on citizens. Based on georeferenced data, the methodological approach generates necessary contributions to the consolidation of democratic actions aimed at overcoming socio-spatial marginalization. Therefore, our general objective is to decipher the current socio-technical conditions under which citizenship is constrained daily by the algorithmization of territory in the metropolis of Rio de Janeiro, aiming at territorial justice.



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C24.34-Marginalization, Globalization, and Regional and Local Response => Globalisation, Localisation and the Reconfiguration of Marginalised Spaces



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1741 - Alpine Villages Between Overtourism Stagnation And Revival. Where Globalisation And Marginalisation Meet

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Life in the Alps is often associated with a romantic image of holidays, untamed nature, and a farming population that is enjoying a good life preferably with cows and alphorn (a traditional music instrument). However, the reality is different: life can be harsh and full of risks, and the inhabitants are working hard to make their living. Tourists only see the surface of their life: farmers are working on their farms to earn money and are not employed and salaried by the local tourist offices (as is sometimes suggested). More importantly: nature is not only romantic but can be brutal, a fact to be experienced every year.

This paper was inspired by a Swiss TV programme on the future of villages in the Swiss Alps and on the transformations that are taking place. It presents four municipalities, opening with a focus on tourism which is a major issue, but farming, emigration and entrepreneurial spirit have also their place, and it lays a focus on the social aspect. The future of many of these villages depends on people's perceptions and initiatives.

The paper opens with an overview of the four cases of the TV-Programme, summarizing the fundamental problems. Additional examples subsequently complete the picture and put everything into perspective.



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1900 - Health Vulnerabilities Of Marginalised Women In Kolkata's Informal Sector Assessing Physical And Mental Health Of Marginalised Women In Kolkata

Dr Sambit Chatterjee¹

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Urban informal economies in India, which is shaped by globalised market pressures depend largely on women's labour. However, the health experiences of these workers remain systematically marginalised. In this paper the physical and mental health of marginalised women employed in Kolkata's informal sector by using the WHO Quality of Life (WHOQOL) framework to capture multidimensional aspects of well-being have been examined. Informal employment characterised by job insecurity, low wages, and absence of social protection intersects with gendered domestic responsibilities which produces chronic health vulnerabilities. A mixed qualitative methodology has been used in this study. A primary survey instrument incorporating Likert-scale questions mapped to WHOQOL domains have been used to assess physical health (pain, fatigue, sleep, functional capacity) and psychological health (stress, anxiety, emotional well-being, autonomy). These quantitative insights were complemented by semi-structured interviews and participant observation which helped in enabling rich exploration of lived experiences of illness, coping strategies, and healthcare access. Purposive sampling has been done to survey women across diverse informal occupations, including domestic work, street vending, home-based production, and casual service labour. Data were analysed using thematic coding, linking health outcomes to structural precarity, financial insecurity, and social marginalisation. Findings reveal persistent physical strain, psychological distress, and fragmented access to healthcare which reflect vulnerabilities shaped by both local socio-economic conditions and globalised urban labour dynamics. The paper underscores the need for gender-sensitive urban health policies, social protection measures, and recognition of informal women workers as key stakeholders in inclusive urban development, situating health equity at the intersection of marginalisation and globalisation by aligning with SDG 3 (Good Health and Well-Being) and SDG 5 (Gender Equality).



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1927 - Globalisation And Spatial Inequalities Impacts On Marginalised Communities In Urban And Rural West Bengal

Prof Dr Snehamanju Basu¹, Dr Mohana Basu²

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Geography, Kolkata-India²

In India economic and social landscapes has been reshaped by globalisation. However its benefits are unevenly distributed, often exacerbating vulnerabilities among marginalised populations. This study examines the differentiated impacts of globalisation over space on communities in urban and rural West Bengal. In urban areas, rapid industrialisation and the growth of informal economies have intensified precarity among low-income workers, migrants, and slum residents. They face insecure livelihoods and limited access to basic services. In rural regions, integration into global markets has disrupted traditional agrarian livelihoods, leading to underemployment, seasonal migration, and widening socio-economic inequalities. Adopting a mixed-methods approach, the present study combines household surveys, in-depth interviews, and spatial mapping to capture lived experiences along with highlighting disparities in economic opportunities, social resources, and infrastructural access. The findings reveal that while globalisation generates sectoral opportunities, marginalised groups with limited adaptive capacity bear the brunt of its negative effects as well. This study upholds the need for policy frameworks that are spatially sensitive and socially inclusive and targeted social protection, skill development initiatives, and participatory urban-rural planning. This study provides actionable insights for designing interventions that mitigate socio-economic vulnerability, reduce inequality, and promote equitable development across West Bengal by emphasising the spatial dimensions of globalisation.



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1937 - Invisible Pillars Challenges And Opportunities Of Marginalized Women In Higher Education Sector

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For the sustainable development and economic prosperity of any nation, equal opportunities for all genders are essential. Gender equality contributes to social harmony, fosters diverse perspectives, and empowers individuals to realize their full potential. In India, however, women continue to experience significant marginalization due to age-old, deeply rooted patriarchal structures that result in systemic disadvantages across education, employment, healthcare, and political representation. These inequities are often manifested through unequal pay structures, limited career mobility, and restricted access to decision-making spaces. Despite the constitutional guarantee of equality, women in India continue to face multiple barriers that hinder their economic independence.

This paper seeks to examine the opportunities and challenges encountered by marginalized women working in the higher education sector. The study adopts a qualitative and descriptive research methodology, drawing on secondary sources such as institutional reports, and existing literature on gender equity in higher education. It further explores the role of institutional frameworks, inclusive policies, and capacity-building initiatives in promoting women's participation, professional growth, and empowerment within academic spaces.

In addition to secondary data, the study incorporates primary data collected through focused group discussions and perception-based surveys to capture lived experiences and institutional realities. By aligning with Sustainable Development Goal 4, the paper emphasizes the critical role of inclusive and equitable quality education environments in national development, while also implicitly reinforcing SDG 5 by advocating gender equality and women's empowerment in higher education institutions.



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3244 - Spatial Determinants Of Functional Diversity In Regenerated Brownfields Evidence From The Silesian Voivodeship Poland

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Until 1990, the Silesian Voivodeship ranked among the most highly industrialised regions of Central Europe. Following the political transition and the restructuring of the national economy, especially the large-scale process of deindustrialisation, a considerable number of post-industrial brownfield sites emerged across the region. The study identified 125 such sites that were regenerated between 1990 and 2019. The combined value of these regeneration projects exceeded EUR 1.7 billion. Public institutions were responsible for approximately 55% of the projects, private companies for 40%, and non-governmental organisations for the remaining 5%. Support from EU structural funds was involved in 37% of the cases. Presentation aims to contribute new empirical insights into how spatial factors influence both the regeneration process and the subsequent functional reuse of brownfield sites. The findings indicate a statistically significant relationship between the distance from the city centre and the new functions assigned to regenerated sites: commercial service activities tended to be located nearest to central areas, whereas manufacturing facilities and investment zones were generally situated farther away. The analysis also demonstrates that post-industrial heritage played an important role in projects involving conversion to public-service functions, while its significance was limited in other types of redevelopment. These findings are discussed with reference to rent gap theory and the brownfield redevelopment potential model, commonly known as the ABC model.



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**C24.34-Marginalization, Globalization, and Regional
and Local Response => Spatial, Societal, and
Marginalisation Dimensions of Climate Change:
Integrating Environmental Science, Policy, and
Inclusive Community Resilience**



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1786 - Droughts And Floods And Their Impact On Small Scale Fisheries In Lake Metztitlan (hidalgo Mexico)

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Background/Hypothesis:

Although Hidalgo (Mexico) has no marine coastline, inland fisheries in Lake Metztitlan—a federally protected Ramsar wetland in a semi-arid region—support rural livelihoods and local food security. In recent decades, the lake has been affected by more frequent droughts and extreme rainfall, increasing hydroclimatic volatility. We assess how these extremes are transforming fish availability, household incomes and adaptation strategies among lakeshore fishing communities.

Materials and methods

We triangulate primary sources (semi-structured interviews with fishers and other stakeholders, field transects, and participatory mapping/cartography) with secondary sources, including hemerographic archives, population censuses, fisheries yearbooks/statistics, and meteorological/hydrological records.

Results:

Documentary evidence and local accounts report repeated episodes of near-complete loss of open-water surface since the mid-twentieth century, with recent occurrences in 2020–2024, alongside overflow-related floods culminating in severe events in 2017, 2021 and 2025. These oscillations degrade habitats and disrupt reproduction cycles of commercial species—both native and introduced—especially tilapia, catfish and carp—reducing catches and income stability. Livelihood stress is associated with temporary and longer-term out-migration, while floods generate additional losses in infrastructure and agro-livestock activities, compounding vulnerability and weakening access to affordable protein in surrounding rural settlements.

Conclusions:

Local responses such as floating cages and small-scale aquaculture help buffer scarcity but are insufficient under escalating extremes. Sustaining small-scale inland fisheries in Metztitlan requires integrated public policies that align wetland conservation with adaptive fisheries governance, monitoring and early-warning systems, infrastructure risk reduction, and social protection and livelihood diversification measures



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1915 - Climate Change Urban Industrialisation And Informal Livelihoods A Socio Spatial Analysis In The Asansol–durgapur Planning Area In West Bengal India

Dr Mohana Basu ¹

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In urban–industrial regions, rapid urbanisation and industrialisation are central drivers of climate change which produces uneven thermal environments, environmental degradation, and increased climate risks. These impacts are spatially differentiated along with disproportionately affecting informal workers whose livelihoods depend on climate-sensitive spaces and activities. In the Asansol–Durgapur Planning Area (ADPA), a major industrial corridor in eastern India, climate change, shaped by industrial urbanisation, affects informal livelihoods has been examined in this paper. The present study explores the intersections of climate stress, urban form, and livelihood vulnerability among informal workers engaged in street vending, waste picking, construction-related activities, transport services, and home-based production by adopting a qualitative social-geographical approach. Across the industrial zones, peri-urban settlements, and informal residential clusters within ADPA primary data have been collected through in-depth interviews, focus group discussions, and spatial livelihood narratives. Thematic coding and spatial interpretation techniques have been adopted to represent the lived experiences of climate exposure, occupational precarity, and adaptive strategies. Findings show that climate impacts are mediated through spatially embedded livelihood pathways. Extreme heat, deteriorating air quality, water scarcity, and ecosystem degradation disrupt work hours which in turn reduce income stability, and intensifies health risks for informal workers working in poorly regulated environments. Industrial land-use patterns, deforestation, and fragmented urban governance intensify these vulnerabilities by pushing informal activities into high-risk zones. Informal workers adopt adaptive strategies by altering work schedules, diversifying income sources, and leveraging social networks. However, these responses remain largely unsupported by formal planning. The study underscores that climate change in ADPA is an environmental outcome of urbanisation as well as a socio-spatial livelihood crisis. It highlights the urgent requirement for climate-responsive urban and labour policies which integrate informal livelihood considerations into planning, zoning, and adaptation strategies. Equitable and inclusive climate governance can be enabled by incorporating qualitative, place-based evidence into policy. This will also strengthen livelihood resilience, and guide sustainable industrial-urban transitions in rapidly growing regions.



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C24.34-Marginalization, Globalization, and Regional and Local Response=> Left Behind Places and Marginality in a Changing World



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1007 - Left Behindness Marginality And Neo Endogenous Development In Oceania

Kim Andreas Kessler¹

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Development thinking in Oceania is often shaped by dominant global and main island perspectives, marginalising the views and experiences of remote island populations. This research aims to shift the focus to the perspectives of people and places on hard-to-reach outer islands. Drawing on qualitative empirical research in southern Lau, located on the fringe of Fiji's outermost province, the study examines how remote island populations experience intersecting and multi-scalar forms of marginalisation and de-marginalisation over time. This presentation explores (1) how local populations on an ultra-remote island experience changes in quality-of-life amid climate change and socioeconomic transformations, and (2) how dynamics between local actors and external actors shape these quality-of-life changes. Findings reveal significant gaps between the lived experiences and aspirations of remote outer island populations and dominant academic understandings and mainstream development practice. Overall, this research highlights the need for a more nuanced spatial development thinking in Oceania that meaningfully engages with the lived realities of ultra-remote island populations.



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1198 - The Geography Of Discontent – On Example Of Electoral Preferences In Poland

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This presentation explores the electoral implications of spatial polarization in Poland. Empirically, it highlights the voting behavior of residents from selected territories as examples of disadvantaged regions, and the conditions that shape such behavior. An analysis of the results of the last three elections to the Polish parliament was used. In the country, were selected two territorial units representing less developed areas and contrasted them with a socioeconomically privileged area and the nationwide results. A reflection of social discontent is the rise of the number and popularity of populist parties. In the background, analogous analyses are presented regarding the Czech Republic and East Germany, which represent Central Europe and historically belonged to the so-called Eastern Bloc. In both Germany and the Czech Republic, support for populist parties is well above average in the peripheralized regions studied, and unusually low in the dynamically developing places. The situation in Poland is somewhat different. Polish electoral maps show that voting behavior has distinct spatial patterns. There is no single political force that exploits voter discontent in lagging areas. Depending on the prevailing cultural and socio-economic conditions, these forces may be more right-wing, more left-wing or even rather centrist. However, support for clearly populist parties in disadvantaged regions reaches similar levels as in the rich community. This means that political choices in less developed regions are based not only on economic conditions but also on socio-cultural and historical ones.



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1499 - Geopolitical Changes In Europe What Are The Consequences For The European Union's Outermost Regions

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The status of the European Union's (EU) Outermost Regions (ORs) is a relatively recent political and legal development, emerging in the 1990s. It is enshrined in Articles 349 and 355 of the Treaty on the Functioning of the European Union and applies to regions located at a considerable distance from the European continent. The framework recognises, on the one hand, structural constraints—such as remoteness, insularity, limited economic diversification and dependence on external markets—which affect economic performance and residents' quality of life. On the other hand, it provides for competitive advantages through positive discrimination, enabling measures that have allowed these regions to converge towards the EU average across key socio-economic indicators.

Despite progress achieved through EU policies, concerns arose in 2025 with the proposal for the Multiannual Financial Framework (MFF) 2028–2034, which reduces or eliminates a substantial proportion of programmes specifically designed to support the Outermost Regions, raising questions about the continuity and effectiveness of EU territorial cohesion policy.

This development occurs within a broader geopolitical and economic context. Since February 2022, Europe has faced a prolonged war in Eastern Europe between Russia and Ukraine. Ukrainian resistance has been financially supported by EU Member States and the United States. However, recent shifts in the stance of the world's leading military power have placed European allies under pressure to assume a greater share of the financial burden, potentially affecting the EU budget amid weak economic growth.

This paper aims to assess the potential consequences for the Outermost Regions from reduced EU support, addressing three questions: what factors drive the proposed reduction? Can national budgets compensate for the decline in EU funding? Does this scenario risk reversing development trajectories, increasing divergence from the EU's overall model? The methodology combines statistical analysis using Eurostat data with structured interviews with Members of the European Parliament representing the Outermost Regions, providing both empirical evidence and institutional insights.



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1794 - The Challenges Of Left Behind Places In The Global South The Case Of South Africa's Free State Goldfields And The Mpumalanga Coal Belt.

Etienne Nel¹

University Of Otago, Geography, Dunedin-New Zealand¹

Background

The term 'left behind places' has gained wide-spread acceptance in academic literature as a catch-all concept which captures the economic, social, political and development challenges and outcomes experienced by once prominent resource extraction and industrial areas which, because of structural and market shifts have lost their once pre-eminent status. Alternatives hard to come by and aside from welfarist responses most interventions appear rather tokenistic. Most writing on the topic is based on the experience of the Global North and that of the Global South has been under-represented.

Methods

Based on 20 years of primary research and document analysis this presentation seeks to help address that gap by focussing on what has happened and what is happening in two once critical mining and industrial areas in South Africa, namely the Free State Goldfields and the Mpumalanga Coal Belt.

Results

The former, once one of the world's richest gold producing regions has, since the 1990s, seen the loss of over 100,000 mining jobs. There has been no concerted response to being 'left behind' and only gradually, through small-scale and sometimes illegal activity is the economy being rebuilt. The second area is currently witnessing the start of significant closures of coal mines and associated industries and power plants with minimal provision been made to deal with the growing challenges. This case examines weak local state and parastatal capacity to respond, the growing influence of criminal activity and the emerging outcomes for peoples and places.

Conclusions

This presentation contributes to the wider discourse on left behind places through providing a perspective from a country in the South where resources, capacity and political will are not in place to the degree they often are in the North to respond to crises and what this means for the future of left behind places and people in the South.



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C24.37-Mountain Studies => Coupling Science and Traditional Knowledge for Sustainable and Regenerative Livelihoods in Mountains



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1178 - Hybrid Knowledge Systems In Transhumant Pastoralism The Case Of Mapuche Goat Herders And Food Processing In Malargüe (argentina)

Fernando Ruiz Peyre¹

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Transhumant pastoralism in mountain regions operates through complex hybrid knowledge systems in which Indigenous knowledge, ecological practices and economic strategies are strongly interwoven. This paper analyses these dynamics through the case study of Kume Matru, a Mapuche association based in Malargüe, southern Mendoza Province (Argentina), an Andean territory shaped by seasonal livestock mobility between lowland wintering areas and high-altitude summer pastures.

Based on qualitative fieldwork with Mapuche herders and association members and the analysis of organizational history, the paper explores how Mapuche knowledge related to territory, livestock, climate, and food practices is coupled with technical and entrepreneurial knowledge. Kume Matru emerged both as a collective response to pressures on ancestral territory and as an innovative organizational model that links pastoral production, territorial defence, and value-added commercialization.

Beyond managing transhumant goat herding, Kume Matru has developed its own brand focused on the processing and commercialization of goat meat. By building local facilities and creating original recipes that combine Mapuche culinary traditions with modern gastronomic techniques, the association seeks to increase value capture within the territory and strengthen Indigenous economic autonomy. This process integrates traditional food knowledge with veterinary science, hygiene standards, processing technologies, and market-oriented expertise, generating new forms of hybrid knowledge rooted in local cultural frameworks.

The findings show that Mapuche pastoral knowledge continues to guide mobility and live-stock management, while modern technical inputs are selectively adapted rather than uncritically adopted. The cooperative structure of Kume Matru facilitates this knowledge co-production, enabling collective learning, generating jobs and negotiation with state institutions and markets.

The paper argues that recognizing transhumance and food processing as Indigenous hybrid knowledge systems challenges static distinctions between “traditional” and “modern” knowledge. The Kume Matru case highlights how coupling modern technologies and traditional knowledge can support sustainable mountain livelihoods, territorial rights and culturally grounded development in mountain regions.



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2572 - Traditional Knowledge And Territorial Disputes Over Lithium Extractivism Related Resources In The Salar De Atacama Chile

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Background/Hypothesis

Chile is the world's leading producer of brine lithium, and the Salar de Atacama concentrates current national extraction. This exceptional hyper-arid territory combines minimal rainfall, intense solar radiation and winds, high evaporation, and salt accumulation, while depending on high-Andean precipitation regimes. Yet high- Andean salars are also surface and groundwater sources, ecological oases, biodiversity refugia, and Indigenous territories.

Hypothesis: lithium expansion under state-private agreements will intensify socioenvironmental conflict by reducing water security and by disregarding Indigenous territorial ontologies that understand salars as integrated socio- ecological systems (pachasofia).

Materials and Methods

We conduct a qualitative synthesis of scientific literature, official and non-official reports, and public/private statements from Indigenous organizations, complemented with assembly minutes, records of Indigenous consultation processes, and participatory cartographies. The analysis focuses on identifying the epistemological and ontological bases mobilized by territorial communities in disputes over water, salt-flat ecosystems, and decision-making.

Results

Findings show that Indigenous arguments articulate salars as complex territorial systems where culture, livelihoods, and nature are inseparable. These frameworks emphasize cumulative basin-scale impacts and the centrality of water to both ecological function and cultural continuity. However, current governance and compensation schemes tend to reconfigure relationships among actors by prioritizing economic offsets over long-term territorial sustainability and binding participation, thereby sustaining asymmetries between state-corporate interests and local rights.

Conclusions

Lithium extractivism in Atacama is not solely a technical resource issue but a conflict over territorial meanings, water, and sovereignty. We recommend strengthening basin-scale safeguards, ensuring prior and informed Indigenous participation with decision-making power, and integrating Indigenous knowledge systems into territorial development proposals to reduce conflict and support socioecological resilience.



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1344 - Montology And Deep Mapping For Sustainable Futures In Italian Mountain Areas

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This paper discusses the potential for developing a transdisciplinary deep mapping approach, integrating it with a montological perspective to enhance understanding of sustainable living strategies within Italian rural municipalities in mountainous regions. Central to this approach are brief residencies by a team of academics and artists within the host municipality, conducted in collaboration with municipal authorities and local communities. Drawing on case studies from Ischia, a mountain-island, and several municipalities in Valle d'Aosta in the Italian Alps, we present our applied deep mapping methodology that combines local, artistic, and academic knowledge. This approach is designed to facilitate dialogue among residents regarding their interactions with the mountain environment and to examine both environmental and social transformations within these communities. Furthermore, it situates these local insights within the broader context of future social, cultural, and economic development goals.

The deep map method promises to blur the boundaries between science and art, as well as between experts and the local population, incorporating in this way also local and artistic knowledge, and intends to avoid hierarchical structures inside the research team. Our experiences indicate that our deep mapping activities triggered spontaneity and situational engagements between people and the landscape. During the stay, a process of place-specific reflection emerged among the population and the members of the research team, which can provide the local communities with a space for dialogue for the formulation of their communal sustainable future.



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1991 - Locals' Knowledge Of Glacial Lake Outburst Floods And The Connectivity Between Locals And Researchers In The Nepal Himalaya Cases In Dolakha And Khumbu

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Background

The challenges faced by downstream residents during glacial lake outburst floods (GLOFs) remain insufficiently explored in developing countries. This study in Dolakha and Khumbu, Nepal, aimed to evaluate residents' knowledge and preparedness regarding GLOFs, investigate their participation in risk reduction, and examine ways to safeguard downstream populations.

Materials and methods

This study consisted of two components. First, digital elevation models and house distribution maps were generated using drone technology in Singati village, Dolakha. An HEC-RAS model produced a prospective GLOF inundation map. A social survey evaluated residents' disaster knowledge. Subsequently, a social survey was conducted through workshops and discussions with stakeholders in Khumbu.

Results

In Singati, the 2015 Earthquake caused numerous house collapses. Google Earth imagery from 2017 to 2020 showed these houses were reconstructed on the same destroyed sites. GLOF inundation estimates indicated potential flooding at these locations. Among 67 households surveyed, only one knew of a hazard map, and two were informed of safe evacuation sites.

In Khumbu, the UNDP implemented the Imja Glacial Lake Water Level Reduction Project. Although dialogue occurred with locals, it was insufficient. Enhanced local engagement is crucial for strengthening stakeholder relationships. Researchers should explain their findings' limitations and conduct workshops for preventing disaster oversensitivity while contributing to evacuation drills.

Conclusions

Implementing problem-solving research projects in developing countries remains challenging without strong connections between communities and researchers. Two main obstacles—budget constraints and project duration—complicate these efforts. Ny now donors typically do not allow expenditure on activities, yet these are essential for development projects. Future donors must approve projects, including research and activities, from the start. Flexibility in project duration is also critical for success.

The co-creation of management strategies, combining residents' experiential knowledge with external researchers' expertise, is vital. Researchers must collaborate rather than impose findings, enabling future autonomy for residents.



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2166 - Chyangra Pashmina As Nepal's Flagship Export Impediments And Accelerants

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Effective stewardship of Nepal's remote mountain ecosystems is unsustainable without economic opportunity for local communities. Historically marginalized, these hinterlands have relied on tourism to jump-start development. Due to its protean nature, the tourism sector has been able to adapt dynamically to evolving conditions at destinations as well as the core gateways.

Moreover, the mountain tourism sector, working synergistically with the cultural amenities of the core areas, has largely driven the economic development in the nation as a whole. However, the "leave no trace" ethos has not been robust enough to protect Nepal's natural and cultural legacy. In addition, the sector is vulnerable to natural disasters, political instability, global competition and trends. And looming close at hand is the spectre of anti-tourism, fueled by congestion and other quality-of-life issues.

To secure long-term sustainability, Nepal must diversify. Exports currently represent only 0.8% of GDP (PPP). The pashmina (cashmere) sector is a strategic priority, with national targets of \$75m by 2026. However, growth is hampered by critical structural impediments. Nepal's producers rely heavily on imported Chinese yarn, leaving the supply chain vulnerable to fraud and lacking domestic quality control. This is compounded by a retail market dominated by low-quality, high-volume demand from regional tourists and widespread disinformation regarding pashmina's technical properties, which erodes consumer confidence. Furthermore, while the product's high value-to-weight ratio makes it an ideal export, the "haggling culture" and the prevalence of sophisticated imitations deter cautious international buyers.

Based on interviews with sector participants, stakeholders and experts, as well as 26 years' personal experience, this paper analyzes the current bottlenecks and proposes specific accelerants: enforcing the "Chyangra Pashmina" collective trademark to combat counterfeits, investing in domestic de-hairing and spinning to break import dependence, and pivoting toward the global "slow fashion" market. By shifting from high-volume, low-trust tourism sales to a transparent, value-added export model, Nepal can align ecological stewardship with a resilient economic framework for its mountain communities.



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2419 - Charting Sustainable Futures For Mountains Journal Of Mountain Science Introduction And Submission Solicitations

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This presentation will introduce the Journal of Mountain Science (JMS), an international, peer-reviewed platform dedicated to advancing research on mountain systems and their sustainable futures. Launched in 2004 and indexed in SCI/SCOPUS, JMS serves as a critical nexus for interdisciplinary scholarship encompassing the physical, ecological, and human dimensions of mountain environments.

We will outline the journal's scope, which includes core themes such as mountain geology, geomorphology and natural hazards; climate change impacts and cryospheric studies; mountain ecology, biodiversity and conservation; watershed management and hydrological processes; socio-ecological systems, livelihoods, and cultural heritage; and technologies for sustainable development and disaster risk reduction.

The presentation will further highlight emerging trends and priority areas in mountain science, emphasizing the growing need for transdisciplinary research that integrates data science, remote sensing, community-based knowledge, and policy analysis to address pressing challenges of environmental change, resource vulnerability, geohazards, project safety and sustainable development in mountain regions globally.

Finally, as the Editor, I will extend a cordial invitation to the symposium participants. We actively solicit high-quality submissions that present original research, insightful reviews, and case studies that contribute to a deeper understanding and resilience of mountain areas worldwide. We look forward to fostering a vibrant academic exchange and showcasing your significant work through the pages of JMS.



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2473 - The Notion Of Verticality In The Context Of Peri Urbanization In Mountain Regions

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This presentation explores the notion of verticality—the complementary use and interconnection of different elevational zones—as a montological key lens for understanding peri-urbanization in mountain regions. Drawing on experiences from the South American Andes and the European Alps, it examines how verticality continues to inform the spatial organization of social-environmental relations amid processes of concentrated and extended urbanization. Traditionally associated with rural subsistence systems, verticality is reconsidered here as a dynamic, relational framework shaping contemporary linkages between “wilderness,” the urban, and the rural. The study employs a compilatory and comparative method, integrating findings and perspectives from environmental geography and environmental anthropology. By combining empirical material with conceptual analysis, it situates mountain peri-urbanization within broader transformations of ecosystemic, infrastructural, demographic, economic, and sociocultural rural–urban linkages. Bringing together insights from diverse field studies and theoretical debates, it identifies how the reconfiguration of elevational zones influences sustainable mountain development. Ultimately, the presentation demonstrates that the notion of verticality operates as both a spatial logic and a socio-environmental construct. By juxtaposing examples from the South American Andes (Peru) and the European Alps (Austria and Italy), it highlights verticality as a productive conceptual tool to rethink the multilayered nature of urbanization beyond the confines of horizontal spatial models.



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2500 - Reclassifying Mount Chimborazo The Political Ecology Of Indigenous Revival Versus Extractivism

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Background

Mt. Chimborazo is central to the development of mountain geography theory and associated foundations of ecology, climate, and biota from the work of Humboldt in the 19th Century. The narrative of biodiversity conservation popularizing “protected areas” in the 1970s officially declared Mt. Chimborazo as a Fauna Production Reserve in 1987, with one of the goals being to facilitate the reintroduction of vicuña (*Lama vicugna*) in the central Ecuadorian páramos. To increase protection of the socioecological system of the mountainscape, we argue for the need to revisit the declaration, to incorporate new narratives of culture-nature hybridity, in proposing Mt. Chimborazo as a UNESCO World Mixed Heritage Site, for its montological and biocultural heritage significance for Andean cultures and their coupled geobiodiversity heritages.

Materials and methods

We utilized a multimethod approach to characterize the mountain ecosystem and its underlying dynamics. Through archival research, extensive fieldwork, archaeological excavations, ethnographic surveys, rapid ecological assessments, and expert interviews, we offer a reformulation that aligns with major global models and facilitates the successful integration of current priorities for mountain sustainable and regenerative development.

Results

We concur on changing the archaic structure of protection to an alternative capturing not only the flora, fauna, and gea of the ecosystem, but most importantly, the significant historicity and cultural capital conserved by mountain communities and make them cocreators and stewards of the ancient Andean heritage of biocultural territories. Among the prospective scenarios, Cultural Landscape, Global GeoPark, Biosphere Reserve, and World Mixed Heritage Site were analyzed.

Conclusion

We aim to update and reframe the conservation priorities of Mt. Chimborazo, thereby enlisting the major Andean “apu” as a UNESCO World Mixed Heritage Site.



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2629 - Climate Induced Environmental Change And Agricultural Vulnerability In The High Altitude Region Of Lahaul And Spiti Western Himalaya

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Abstract

The high-altitude farming systems of Lahaul and Spiti, situated in the western Himalaya, are increasingly vulnerable to environmental changes driven primarily by climate variability and socio-ecological stressors within the ecosystem. These mountain agroecosystems, characterized by short growing seasons, very high temperature fluctuations, and scarce water supply, are among the most prone to climate change. Because of this, traditional crop production might be severely disrupted, and thus the whole area might be threatened by food shortages. This research is based on a composite index framework that integrates exposure, sensitivity, and adaptive capacity through a range of biophysical and socio-economic determinants and is divided into region-specific Agricultural Vulnerability in Lahaul and Spiti, which helps quantify the spatial patterns of vulnerability. The outcome of this research shows that there is significant variation in agricultural risk, with high-altitude communities showing greater susceptibility to climatic extremes, unstable seasons, and limited adaptive resources. It is evident that agricultural vulnerability in ecologically sensitive Himalayan regions is multipronged; hence, it has been emphasized that there is an urgent need to implement targeted, evidence-based climate adaptation strategies. The process of making the mountain farming systems that are under the influence of environmental change resilient will not be an easy task, and it will require solutions that integrate policies, infrastructural improvements, community engagement, and technology adoption, each of which will be customized according to the specific challenges posed by the mountain farming systems.



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2644 - Automated Landform Classification Of Türkiye Based On Hammond's Method

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This study examines the applicability of E.H. Hammond's 1964 macro-landform classification method when automated and applied to Türkiye's highly heterogeneous macro-landform structure, comparing it with global classifications that employ a similar approach. This ongoing research, based on Hammond's original physiographic framework developed manually, uses an automated, DEM-based application of the method to identify major macro-landforms across Türkiye, including mountain systems, plateaus, and plain areas. The study evaluates how globally automated Hammond-type approaches perform in a tectonically active and topographically diverse environment that differs significantly from the landscapes for which the method was originally designed. The analysis focuses on methodological sensitivities related to slope thresholds, local relief calculations, neighborhood analysis window sizes, and mountain-plateau transition representation. Preliminary assessments indicate that automated Hammond classifications provide consistent and repeatable results on a large scale, but may oversimplify or misrepresent certain macro landform boundaries, particularly in areas with complex relief transitions. These issues are particularly important for mountainous areas, where terrain feature definitions directly impact hazard assessments, environmental modeling, and spatial analyses of human-environment interactions. By highlighting the limitations of automated global terrain feature classifications, this study contributes to ongoing discussions on the role of geomorphometry, AI-assisted spatial analysis, and scale-sensitive methodologies in mountain research. From a montological perspective, the article advocates for context-sensitive adaptations of global models and emphasizes the importance of locally grounded morphometric frameworks for understanding environmental change and socio-ecological dynamics in mountainous regions.



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C24.37-Mountain Studies => Mountain Futures: Cryosphere Dynamics, Hydrology, Hazard and Resilience in a Changing Climate



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1571 - Depth Dependent Soil Creep On Humid Temperate Hillslopes Soil Residence Time Constrained By Turnover

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Background / Hypothesis

Soil on humid temperate hillslopes slowly moves downslope, with fluxes varying by depth. This is driven by depth-dependent dominant soil creep processes, which can lead to the formation of subsurface structures. Our previous studies have estimated long-term soil creep fluxes and residence time profiles using Be-10. However, conventional models do not constrain soil residence time by soil turnover, potentially underestimating residence times relative to soil production rates. This study re-estimates depth-dependent soil creep profiles by incorporating soil turnover time into the conventional model.

Materials and Methods

This study applied an enhanced soil creep model incorporating both disturbance and plastic deformation. Model parameters were estimated for a dynamically equilibrated granodiorite hillslope in the northern Abukuma Mountains, Japan, with a convex ridge and planar midslope. The soil mantle comprises a mixed upper layer over a lower residual soil layer. Soil production rates were estimated from in-situ Be-10 in bedrock at ridge crests, providing soil thickness-dependent turnover times for the soil base. Depth-dependent soil residence times were estimated by fitting models to meteoric Be-10 depth profiles with a global supply flux, yielding soil creep profiles.

Results

Estimated soil residence times fall within the range of C-14 ages from charcoal fragments, supporting our model assumptions. Mean soil creep fluxes increase systematically from ridge to downslope. As hillslope geometry becomes more planar, soil creep profiles exhibit exponential decay in the upper layer and linear decay in the lower layer. Disturbance-driven mixing enhances soil creep near the surface, progressively increasing the thickness of the actively transported upper soil layer.

Conclusions

The soil creep model integrating in-situ and meteoric Be-10 provides robust constraints on subsurface structure development in dynamically equilibrated hillslopes. Extending the model to non-equilibrium hillslopes enables estimation of subsurface structure formation timescales and links to shallow potential sliding surfaces.



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1908 - Chemical And Mechanical Denudation In A Mountain Catchment Based On Long Term Monitoring

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The magnitude of chemical and mechanical denudation within river catchments provides key insight into the strength of processes responsible for long-term landscape evolution. Denudation processes involve the removal of rock material from the Earth's surface through erosion, changes in relief and the transport of rock material. The impacts of both chemical and mechanical denudation may be assessed at local to global scales by quantifying the flux of sediment and solute in the stream or river.

This study examines long-term changes in atmospheric chemical deposition and in-stream chemical and mechanical denudation in a small Carpathian catchment (13 km²) during the period 1995–2023. A balance of chemical denudation was established based on continuous monitoring of precipitation chemistry, stream water composition and suspended sediment transport. Major ions in precipitation and stream water were analysed using ion chromatography, while suspended sediment loads during flood events were quantified using bottle sampling.

Over the study period, gradual changes in hydroclimatic conditions were accompanied by pronounced shifts in runoff seasonality and snow regime characteristics. At the same time, declining concentrations of dissolved ions resulted in a 23% reduction in chemical denudation during the most recent decade. Nutrient loads decreased by 38%, reflecting improved wastewater management and reduced agricultural activity, which also contributed to a substantial decline in suspended sediment transport. In contrast, mechanical denudation remained strongly controlled by episodic hydrometeorological extremes. The results highlight the value of long-term catchment monitoring for understanding the combined effects of natural variability and human influence on denudation processes in mountain environments.



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1989 - Tracking Climate Adaptation From Valley To Glacier A Geospatial And Participatory Study In The Bhilangana Basin Himalayas

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TRACKING CLIMATE ADAPTATION FROM VALLEY TO GLACIER: A GEOSPATIAL AND PARTICIPATORY STUDY IN THE BHILANGANA BASIN, HIMALAYAS

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Keywords: Climate Stressors, Climate Adaptations, Valleys, Glaciers, Bugyals

Climate adaptation in mountain basins is shaped by the interplay of climate stressors, ecological gradients, and social differentiation. This study examines climate change impacts and adaptation strategies along a valley- to- glacier gradient in the Bhilangana Basin of the Central Himalaya, using an integrated geospatial and participatory approach. There are two main hypotheses considered, one being that the gradient impacts the adaptation strategies and second that adaptation intensity of women and men are different. The study employs multiple methods combining geospatial and non-spatial data sets and extensive focus group and participatory meetings and treks. The research covers a vertical transect from Ghuttoo village ($\approx 1,600$ m) through Gangi village ($\approx 2,500$ m) to the Khatling Glacier ($> 3,800$ m), with additional analysis of the Panwali Kantha alpine meadow ecosystem. Parameters analyzed include glacier area change (Khatling); snow cover persistence; NDVI change (Panwali Kantha bugyal); land-use/land-cover change; and slope and hazard exposure. Multi-temporal satellite data (Landsat, Sentinel-2; 1990–2025) indicate a significant reduction in glacier area ($\approx 15\text{--}20\%$), a decline in snow cover duration, and a measurable shift in vegetation phenology in alpine bugyals. Climate data reveal an increasing temperature trend ($0.\approx 0.3\text{--}0.4$ °C per decade) and greater precipitation variability. The geospatial mapping and long conversations across the villages involving men, women, and local porters, were quite enlightening. Results show strong altitude-dependent adaptation patterns, with women increasingly engaged in water and fuel management, men adjusting cropping and migration strategies, and porters modifying trekking routes and seasonal timing. The study demonstrates that effective climate adaptation in Himalayan river basins requires integrating spatial climate evidence with localized, gender- sensitive adaptive practices.



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2382 - Subglacial Carbonates And Their Palaeoenvironmental Importance

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Subglacial carbonate crusts, formed between glacier ice and bedrock, can indicate the past presence of glacier ice. In the southeastern Alps, these deposits were recently exposed by the retreat of the Triglav and Skuta glaciers, Slovenia. They mainly consist of calcite with elongated columnar crystals growing perpendicularly or at an angle to the bedrock, aragonite (usually needle-like) crystals, or layered structures of micrite and/or microsparite. Their greatest concentration is on carbonate bedrock recently uncovered by retreating ice, and their occurrence rapidly decreases with distance from the present glacier margin. Mapping of subglacial carbonates near the glaciers showed that they become increasingly weathered with distance from the glaciers, until they are no longer found beyond certain point. We inferred that the more weathered subglacial carbonates had been exposed for a longer period. Uranium-thorium dating of the carbonates shows they formed during the Pleistocene and also in the Holocene, up to 1,500 years ago. These ages suggest that glaciers persisted or reformed during colder phases throughout the Holocene. Cosmogenic ³⁶Cl exposure dating supports this interpretation. This indicates that the glaciers, although reduced in size, did not disappear entirely during the Holocene. To evaluate the hypothesis of long-term preservation, we tested the carbonates' resistance to frost weathering in a controlled freezing chamber. The results show that subglacial carbonates are susceptible to frost weathering and can be eroded relatively quickly by natural freeze-thaw processes. Their present-day preservation strongly implies that glacier ice remained over these surfaces until recently. Together, the ³⁶Cl exposure ages and frost weathering tests indicate that the current glacier retreat is more extensive than at any time in the Holocene, even during the warmer Holocene Climatic Optimum.



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2417 - Two More Decades Of Publication In The Journal Of Mountain Science Advancing Mountain Futures Through Integrated Science

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The world's mountains are sentinels of climate change, where accelerating cryospheric loss is fundamentally altering hydrological regimes, amplifying geophysical hazards, and testing the resilience of ecosystems and communities. This presentation synthesizes the past two decades of pivotal research published in the Journal of Mountain Science, charting the evolution of our understanding of these interconnected systems. Using bibliometric method and enumerating typical articles and authors, this presentation will highlight the following key thematic advances: (1) the quantification of cryosphere dynamics (glacier mass loss, permafrost degradation, and snow cover variability) and their cascading impacts; (2) the consequent shifts in mountain hydrology, affecting water availability, seasonality, and extreme flows downstream; and (3) the heightened magnitude and frequency of multi-hazard cascades, including glacial lake outburst floods, landslides, and debris flows. Crucially, we demonstrate how the journal has fostered a critical transition from pure process-based studies towards integrative research that links physical science with societal resilience. By curating special issues and promoting interdisciplinary work, the Journal of Mountain Science has served as a platform for frameworks that bridge observation, modeling, vulnerability assessment and conservation. Looking to the "Mountain Futures" agenda, we argue that the next frontier requires enhanced integration of high-resolution remote sensing, community-based monitoring, and transnational governance models. This journal will commit to report actionable science that informs climate adaptation, sustainable development, and risk reduction strategies, thereby contributing to the resilience of mountain regions and the billions who depend on them in a rapidly changing climate.



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2458 - Hydrographic Evolution And Siltation Eutrophication Processes Of Periglacial Lakes On Horseshoe Island (antarctica)

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Due to the change in global climate, the ice sheet in some parts of Antarctica, which has 90% of the total glacier area of the planet, is rapidly retreating, leading to the expansion of glacier-free areas on the continent's marginal belt. In this context, Horseshoe Island, where the Turkish Scientific Research Camp is located, has taken on a structure that reflects the conditions in which the transition phases from glacial processes to paraglacial, proglacial and periglacial processes are observed. The dramatic morphogenetic process changes that have occurred in the recent past have prepared the environment for the formation of lakes that emerged under the control of these processes on the island and reflect the early youth phase of periglacial field lakes. In this way, Horseshoe Island lakes are considered rare examples and perfect laboratories where the initial period of siltation/eutrophication processes can be investigated. It is possible to understand and define the primary conditions of lakes in periglacial regions through the lakes on the island and to compare these conditions with relatively mature or older periglacial lakes with a longer history. Understanding how mature/old periglacial lakes, which are frequently encountered, especially in high-latitude countries and middle-belt countries with high altitudes, reached their current conditions and what kind of changes they will undergo in the future can also be achieved through research in this context. Fortunately, lake sediments that contain long-term and detailed records of paleoenvironmental changes, reconstruction of long-term changes can be made with paleolimnological techniques. This study examines and presents the preliminary results Horseshoe Island periglacial lakes, which will be studied in Turkish Antarctic Expedition X (February 2026) within the framework of a scientific methodology that starts by revealing the current and working processes of the physical environment and deepens with sediment, radiocarbon, stable isotope, geochemistry, and microfossil analyses.



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2505 - Comprehensive Remote Monitoring Of Lake Sevan (armenia) To Assess The Environmental Condition And Changes

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High-altitude lakes, which are often a resource base for recreational development, are not always well studied, especially in the context of climate change. This study conducted a multi-temporal analysis of the water area and coastal strip of Lake Sevan, located in the central part of the Republic of Armenia at an altitude of about 1,900 m above sea level. The lake has repeatedly experienced changes in water level and irrational water use in the past. The research is divided into the following areas: the study of the coastline and processes; the study of the water area and the reservoir bottom; and the mapping of the coastal area and the lake basin.

To study the processes and assess the ecological condition of the lake's water area and coastal territories, remote sensing data of various temporal coverage and spatial resolution were processed. As part of the fieldwork, aerial photography of key areas was carried out over several years using UAVs (optical, multispectral, and thermal), allowing for a highly detailed study of the processes in these areas.

Based on organized remote sensing data and topographic maps, it was possible to reconstruct the lake's shoreline position over 120 years, as shoreline changes are a major factor in the lake's eutrophication. The study of the shoreline is also related to the mapping of shoreline types and processes today and in the 1960s.

Multitemporal data enable analysis of landcover in the coastal zone, enabling tracing of changes over 60 years. The results provide detailed information not only about the rates of processes, but also about the main changes in the light of anthropogenic pressure.

The study of the lake's water area focused primarily on water blooms and the analysis of the prerequisites for these processes. Based on a comparison of the results of decoding satellite images to identify indicators of harmful algae blooms, chlorophyll a, Secchi disk, and lake surface temperature, a method for recording and monitoring lake blooms was developed.



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2546 - Monitoring Changes In Snow Cover Extent Of The Sierra Nevada De Santa Marta Glaciers (colombia) Using Modis 10a1

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Glaciers, particularly at low latitudes, are subject to significant and constant decadal warming, resulting in a significant decline in surface area with negative mass balances (IPCC, 2019). By 2100, under the RCP8.5 warming scenario, glacier mass is expected to decline by more than 80%, with significant hydrological consequences for downstream ecosystems and populations. Despite their high altitude (over 5,000 m), the glaciers of the Sierra Nevada de Santa Marta in northern Colombia are already affected and sensitive to the effects of climate change due to their proximity to the Caribbean coast. We propose multi-decadal monitoring (2000-2025) of snow cover changes, as provided by MODIS 11A1 satellite data. Using R Studio, the data are first filtered (QA band) and then various interannual temporal indicators are selected for multi-decadal and multi-annual monitoring (date of onset of snow cover, date of end of snow cover, annual duration of snow cover, date of annual maximum snow cover). For each indicator, a Mann-Kendall trend test is applied, followed by Sen's estimator to statistically determine the significance and magnitude of snow cover loss. Over all hydrological seasons (2000-2025), initial results suggest a general downward trend in snow cover ($t=-0.23$, $p < 0.1$). After removing the year 2022 (exceptional snowfall, negative ENSO phase), the negative trend is significant and more pronounced ($t=-0.32$, $p < 0.05$). The modeled Sen slope suggests a rate of decline in snow cover of -0.22% per year for the entire glacier, consistent with studies conducted using Landsat imagery. In terms of surface area, the total loss estimated between 2000 and 2025 is around 53% (49.2 and 23.2 km² respectively). These results suggest a rapid acceleration in the decline in snow cover for these glaciers. In contrast, an analysis of the surface area of glacial lakes could be conducted to identify the immediate consequences of glacial melting. The links between the intensity and speed of air warming, precipitation levels, and detected snow areas need to be studied, as does a more in-depth analysis to identify the glaciers and slopes most exposed to snow loss.



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3187 - A Transferable Insar Optical Framework For Semi Automated Mapping Of Debris Cover Glaciers Insights From The Bara Shigri Siachen Zemu And Gangotri Glaciers In The Western Himalayas

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Debris-covered glaciers represent one of the most difficult challenges for the mapping and quantifying of glaciers due to strong spectral similarity between supra-glacial debris and surrounding terrain. As debris cover alters melt rates, hydrological contributions, and the stability of glacier termini, robust and transferable mapping techniques are essential for assessing climate-driven change. This study incorporates an automated, multi-sensor methodology that integrates Sentinel-1 InSAR coherence, optical indices, and DEM-based terrain thresholds to delineate dynamically active debris-covered ice. Applied to the one of the largest debris-covered glaciers in the Western Himalayas Bara Shigri, the workflow combines coherence (<0.30) to isolate unstable ice surfaces, NDSI (<0.40) to exclude clean ice, slope constraints ($<30^\circ$) to remove non-glacial steep terrains, and layover-shadow masks to minimize SAR-geometry artifacts. Morphological post-processing enhances spatial continuity, and targeted visual refinement using Sentinel-2 NDWI resolves terminus misclassification caused by proglacial meltwater activity. The results indicate a supraglacial debris extent of $\sim 23.12 \text{ km}^2$ for Bara Shigri in year 2023, representing approximately 22.8% of the glacier area and aligning with earlier field-supported estimates. Multi-temporal analysis (2015–2023) reveals a significant dynamic transition: a major tributary previously connected to the main trunk now displays high coherence at the confluence, indicating cessation of motion and effective structural detachment. The decoupled tributary accounts for an apparent reduction of $\sim 10.8 \text{ km}^2$ in active glacier area, underscoring the diagnostic value of coherence in distinguishing stagnant ice from flow-connected mass. This form of dynamic disconnection is rarely captured in optical datasets alone and has direct implications for reassessing inventory boundaries and understanding evolving mass-flux regimes. To evaluate transferability, the same workflow and thresholds were applied without site-specific tuning to Gangotri (Central Himalaya), Zemu (Eastern Himalaya), and Siachen (Karakoram), representing contrasting climatic and geomorphological conditions. The method reliably mapped debris cover across all three glaciers, estimating debris areas of 55.26 km^2 for Gangotri ($\sim 40\%$), 29.83 km^2 for Zemu ($\sim 33\%$), and 117.86 km^2 for Siachen ($\sim 11\%$), consistent with regional variability and previously reported trends. The successful cross-regional performance demonstrates the feasibility of a scalable, threshold-based SAR-optical fusion framework for Himalayan debris-covered glacier mapping.



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3233 - Climate Variability (enso A Enso) And Its Influence On The Hydrogeography Of The Venezuelan Andean Highlands

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The biophysical conditions of tropical highlands make them particularly sensitive to atmospheric processes, and changes in hydroperiods are usually the most noticeable indication of climatic fluctuations. They are therefore considered reliable indicators for monitoring the effects of climate variability/climate change at regional and local scales. This ongoing research project analyses the impact of ENSO/Anti-ENSO variability on the hydrological conditions of Venezuelan Andean highland watersheds, considering different geographical locations. Two examples are presented: the first is an intra-mountain headwater catchment at an elevation ranging from 3,460 to 4,060 m; the second is an exo-Andean catchment located on the western hillside at an elevation ranging from 333 to 4,300 m. In both cases, time series of 51 and 44 years respectively were defined and climatologically typified based on the Oceanic Niño Index 3.4 (ONI). Sample years were selected for climatological analysis based on the availability of LANDSAT imagery, in order to monitor vegetation moisture and water status using the following spectral indices: moisture stress index (MSI), normalised difference water index (NDWI) and normalised difference vegetation index (NDVI). The spectral values were statistically compared with the ONI and the observed climate data, and the percentage deviation of the anomalies was estimated. The results showed that the hydrological dynamics in the two catchments are significantly influenced by the combination of ENSO/anti-ENSO anomalies and neutral years. However, the level of severity differs depending on location within the mountain system, position within the hydrological landscape, biophysical environmental conditions, and the sequential relationship and intensity of interannual anomalies. Although the results seem conclusive, they are limited in terms of space and time, and the processes involved are extremely complex. Therefore, additional research is required to improve our understanding of climate variability and its impact on the hydrogeographical conditions of tropical mountain catchments.



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C24.37-Mountain Studies => Mountain Vulnerabilities: Best Practices in Resilience, Restoration and Sustainable Solutions



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1455 - Rural Depopulation And Sustainable Habitability In Uttarakhand Himalaya

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Over the last two decades, the Uttarakhand Himalaya have suffered widespread depopulation, leading to the emergence of a phenomenon known as “Ghost Villages”. The study is based on the hypothesis that environmental, social, economic opportunities, and institutional dimensions result in a decline of human habitability, which plays a key role in driving out-migration and uninhabited settlements in rural Uttarakhand. The study develops a Human Habitability Index (HHI) with environmental and socio-economic dimensions, and the key variable to analyze district-wise habitability of Uttarakhand. The study also aims to determine the correlation between uninhabited villages and levels of habitability across Uttarakhand using statistical tools. Furthermore, Geographic Information System based mapping techniques are employed to visualize district-wise variability in habitability and patterns of village depopulation in Uttarakhand. The study observes a clear contrast in the levels of habitability across Uttarakhand. The least habitable districts such as Pauri and Almora lack livelihood opportunities and access to basic amenities to sustain life. These areas also suggest increasing ecological stress, which in turn leads to higher levels of village abandonment. However, districts, such as Dehradun, lying under the most habitable class have relatively better access to livelihood opportunities, better socio-economic conditions, and greater settlement stability. The findings suggest there is a negative correlation between village depopulation and levels of habitability in Uttarakhand. The study emphasizes human habitability as the major component influencing rural out-migration in the Uttarakhand Himalaya. It recommends that depopulation requires planned and sustainable solutions rather than short-term interventions to address the issue. Better access to basic amenities, improving local livelihoods, and identifying suitable pathways for planned resettlement are vital for supporting long-term resilience and sustainable habitation in vulnerable mountain regions.



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1931 - Land Degradations Caused By The Trampling Of Humans And Livestock In Mountain National Parks

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Background

In recent years, mountainous national parks have become popular destinations for nature-based tourism. Increasing recreational use inevitably causes negative impacts on the surrounding environments (e.g., vegetation loss and soil erosion). In some developing countries, mountain communities are allowed to reside even after the establishment of national parks. Mitigating the environmental impacts of tourists and local communities has been a significant challenge for national park managers.

Materials and Methods

Sagarmatha National Park (SNP), Nepal, is one of the most well-known trekking destinations worldwide. Because no vehicle roads exist, trekkers, residents, and pack animals (e.g., mules and yaks) used for transporting goods all need to use the trails. The combined impact of human and livestock trampling has caused extensive land degradation around the trails and grazing lands.

This study aimed to demonstrate the land degradation pattern around trails and grazing lands in SNP through high-definition three-dimensional mapping surveys using an unmanned aerial vehicle (UAV). This study created topographic maps of the trail section (resolution = 2 cm) and grazing slope (resolution = 3 cm) at Machhermo using images acquired in October 2023 and analyzed the distribution patterns of livestock tracks and gully erosion.

Results and Conclusions

Gullies with depths of 5–80 cm developed primarily in areas with slopes exceeding 15 degrees. Collapses ($n = 8$) with an average area of approximately 29 m² occurred intermittently in sections perpendicular to the convex terrain (slopes ≥ 30 degrees). Livestock tracks with a width greater than 15 cm were mapped across five grazing slopes (area = 96,276 m²). The average distribution density was approximately 0.6 tracks per meter. The high-definition topographic maps enabled visualization and detailed analysis of the trampling impacts of humans and livestock in SNP. Advanced mapping approaches can help promote science-based management of natural resources in mountainous protected areas.



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1952 - Women Fuelwood And Clean Energy Transitions In A Vulnerable Mountain Landscape Evidence From Pauri Garhwal Himalaya (1985–2025)

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Women, Fuelwood and Clean Energy Transitions in a Vulnerable Mountain Landscape: Evidence from Pauri Garhwal Himalaya (1985–2025)

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Keywords: Women, Mountain vulnerabilities, Fuelwood, LPG, Government intervention.

The present study traces four decades (1985–2025) of women's fuelwood use in the Khatalgad watershed of the Garhwal Himalaya using a watershed-level, energy-consumption- and vulnerability-informed approach. The research integrates four phases of household surveys to assess energy transitions amid mountain-specific vulnerabilities, including steep terrain, forest degradation, shifting demand, climate stress, disaster exposure, and male outmigration. The first survey, conducted between 1985 and 1986, covered 24 villages across different altitude zones in the watershed and focused on women and fuelwood resources. After 10 years, a larger-scale survey was conducted, including twice as many villages. The Mountain Energy Vulnerability Index (MEVI) was calculated, and MEVI zones were delineated. Women's travel routes, travel times, the bundles of wood they carried on their heads in different seasons, and their emotions are mapped, along with the varied forest paths demarcated using both topographic sheets and satellite data. With the introduction of LPG access in 2016, a new storyline was pursued and mapped, and a comparative survey was conducted in 2024. Although the Pradhan Mantri Ujjwala Yojana has improved access to clean cooking fuel, the persistence of fuelwood reflects adaptive responses to Himalayan risk conditions, including unreliable supply chains and increased winter energy demand. Findings indicate that while government intervention has affected fuelwood use since 2016, it has done so only partially and in heterogeneous ways. The study argues that energy transitions in mountain ecosystems cannot be limited to access alone; instead, they should incorporate vulnerability, resilience, and women's adaptive strategies within fragile socio-ecological systems.



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C24.38-Political Geography => Feminist Political Geography – Rethinking Power, Place, and Resistance



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1163 - The Dubbed Territory Insar Atmospheric Correction And Acoustic Sovereignty In Indigenous Taiwan

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In the geopolitical context of Taiwan as a so-called “Silicon Island,” sovereignty is conventionally understood as cartographically inscribed through maps, borders, and infrastructures. This paper argues instead that sovereignty is increasingly produced through technological acts of “dubbing.” Drawing on Tom Boellstorff’s concept of dubbing culture, I re-theorise post-disaster governance in Indigenous Rukai territories following Typhoon Morakot as a form of technological dubbing, enacted through remote sensing and risk modelling.

Focusing on the deployment of InSAR (Interferometric Synthetic Aperture Radar) in landslide monitoring and relocation planning, I examine how atmospheric correction algorithms function not only as technical procedures but as political operations. By filtering out clouds, mist, and atmospheric interference, these algorithms transform heterogeneous, inhabited landscapes into a single, mono-channel signal of geological risk. I argue that this process operates analogously to sound engineering: it suppresses polyphonic forms of dwelling, memory, and Indigenous environmental knowledge by enforcing a mono-channel “risk voice.”

Based on interdisciplinary analysis combining policy documents, disaster governance frameworks, Indigenous testimonies, and critical cartographic interpretation, the paper conceptualises this process as the production of a “dubbed territory”—a landscape whose visual form remains intact while its ontological and epistemic voices are overwritten by a unified state script operating in what I term “Silicon Time.” This temporal regime privileges immediacy, synchronicity, and national scalability, in contrast to the metabolic, relational, and multi-temporal “soil time” of Indigenous life.

In response, the paper proposes the concept of acoustic sovereignty as a critical intervention within feminist political geography and Indigenous STS. Through a speculative counter-dubbing experiment using generative AI and text-to-world modelling, I explore how Indigenous oral narratives can be re-articulated as volumetric spatial environments, not as representational maps but as sonic-spatial propositions. Rather than seeking to correct the map, this approach foregrounds the political potential of noise, glitch, and untranslatability. The paper concludes by arguing that attending to the sonic dimensions of remote sensing opens new pathways for rethinking sovereignty, risk, and territorial governance beyond visual-centric cartographic paradigms.



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2171 - Racialized Urban Change And The Whitening Of Lisbon Gentrification Coloniality And The Right To Stay

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This paper presents preliminary reflections on the racialized dimensions of gentrification in Lisbon, developed from an ethnographic encounter with Darlen, a Cape Verdean woman whose life story illuminates the intersection of race, class, gender, and migration in the city's reconfigured urban landscape. Through her experience, we reflect how everyday struggles for housing and belonging expose the subtle forms of exclusion embedded in urban transformation. While most studies of urban restructuring in Portugal emphasize class and financial dynamics, this work argues that race and coloniality are central to understanding how urban policies produce displacement and inequality. The Black presence in Lisbon's central neighborhoods—historically rooted in the city's Atlantic past and reconstituted through postcolonial migration from Africa and Brazil—has long been marginalized. In recent decades, urban rehabilitation, tourism-led revaluation, and transnational investment programs such as Golden Visa and Non-Habitual Resident regimes have intensified indirect displacement and the erasure of Afro-descendant cultural presence. The whitening of the city thus operates not only as demographic substitution but as an aesthetic and political project that privileges whiteness as the normative urban identity. By linking gentrification to racial capitalism and the coloniality of power, the paper interprets contemporary urban change as part of broader mechanisms of racial and spatial exclusion. In conclusion, the paper shows that recognizing the entanglement of race, coloniality, and inequality is essential for advancing a critical urban analysis capable of interrogating how planning practices reproduce structural hierarchies while fostering epistemic inclusion and spatial justice in contemporary Lisbon.



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2623 - The Urban Geopolitics Of Geotrauma Atmospheric Engineering And Affective Governance In Nansan China

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Background/Hypothesis: Nansan, a Chinese border town, has long been plagued by armed conflicts in neighboring northern Myanmar. Geopolitical violence is “hardwired” into residents’ daily lives through mnemonic trauma, soundscapes, and material destruction. Drawing on geotrauma (Pain, 2021), this study explores how the state transforms urban space to heal trauma and maintain border stability. We hypothesize that material interventions—such as renovating bullet-holed facades—constitute a mechanism of “affective counter-violence” that governs through the regulation of sensory and emotional atmospheres.

Materials and Methods: Our ethnographic research in Nansan examines the state’s affective governance logic. Methods include field observations of infrastructural transformations and qualitative interviews. We analyze how the state attempts to curate a non-violent atmosphere and reconstruct narratives of national resilience by burying traumatic memories under sanitized physical facades.

Results: Findings reveal significant friction between top-down “atmospheric engineering” and residents’ persistent, embodied trauma. While the state seeks to manufacture a narrative of resilience, residents’ non-linear insecurity persists, which fluctuates with unpredictable environmental cues rather than following a linear path to peace. This disconnect highlights how geotrauma persists beneath state-curated veneers, maintained through the interplay of sensory soundscapes and urban materiality.

Conclusions: This study contributes to feminist political geography by theorizing the interaction between state-led atmospheric engineering and embodied geotrauma. We argue that while atmospheric engineering functions as a spatial mechanism to “sanitize” trauma, geotrauma remains a persistent presence surging beneath these curated veneers. Therefore, we advocate for a “trauma-informed” geopolitical analysis to reveal the lived and sensory dimensions of power often obscured by state-centric security. Ultimately, this research provides new insights into the interaction between violence/non-violence and affect, expanding analytical pathways for the interplay of power, materiality, and sensoriality.



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2787 - Borders Space Time That Materialize Norms A Feminist Approach To A Renewed Understanding Of Borders

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The presentation builds on border studies scholarship that has established international limits as “more than lines”. Using a spatial alphabet made of points, lines and zones, I will detail the multiple aspects of contemporary borders, emphasizing how these are now shaped by a common horizon of management. This model of a global border stands in profound contradiction to a *longue-durée* perspective on the transformation of spatial limits worldwide. A feminist perspective in geopolitics allows to reframe our understanding of the politics of scale, both of space and time.

Approaching the definition of borders through an understanding of their processual dynamics reveals two essential trends in this geo-history: on the one hand, the existence of a “bio-social invariant” (Raffestin, 1992), and on the other, the multiplicity of its phenomenological forms. If we define borders in both temporal and spatial terms, we can propose understanding them as “space-times that materialize norms.” (Amilhat Szary, 2020) and how this triadic relationship between space, time, and norms evolves over time. Moreover, thinking of borders in terms of domination and resistance rather than merely power opens on a broader review of the modalities in which the norms that space and time embed are negotiated upon political divides.



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C24.38-Political Geography => Planning for Sustainability : Equity of Access in a Changing Climate



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2045 - Streets At The Frontlines Of Climate Change Informality Infrastructure And Just Transitions In Indian Cities

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As climate change intensifies, Indian cities are witnessing growing inequalities in exposure to heat, flooding, pollution, and infrastructural precarity. These inequalities are most visible on streets and in public spaces where everyday economic and social practices are concentrated, yet where climate vulnerability remains marginal to dominant planning and climate governance frameworks. Drawing on insights from a collaborative project on just transitions in three Indian metropolitan cities (Delhi, Bengaluru, and Kolkata), this paper examines how climate impacts, mediated through informality, religion, caste, gender, and urban governance, shape uneven conditions of resilience on streets as lived, worked, and contested urban environments.

This paper foregrounds streets as sites where work, mobility, shelter, and social reproduction converge, and where climate impacts are encountered and managed in everyday practice. Climate stressors, such as extreme heat, erratic rainfall, and flooding, interact with everyday infrastructural deficits, including a lack of shade, water, sanitation, rest spaces, and secure tenure, producing layered and cumulative vulnerabilities embedded in street-based practices. These conditions are further shaped by planning paradigms that prioritise sanitised, growth-oriented urban imaginaries, rendering street-based economies and uses of public space peripheral to sustainability agendas.

The paper argues that advancing climate justice in urban contexts requires rethinking planning frameworks to recognise streets as critical socio-ecological spaces and as central arenas of climate exposure, adaptation, and governance. It emphasises the importance of community-engaged approaches to knowledge production that foreground everyday street practices, enabling grounded understandings of climate risk and adaptation from the street upward. By placing streets—rather than sectors or policies—at the centre of debates on just transitions, the paper contributes to broader discussions on embedding equity, sustainability, and justice in urban environmental planning in the Global South.



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2190 - Planning Dilemmas Of The Invisible The Complexity Of Development In Al Qudes Jerusalem Urbanized Region

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The false urbanization in Jerusalem area occurred under ethno-national and geo-political rooted conflict. This conflict still not settled between the Israeli and the Palestinians who live in the city region. As a result of this conflict, the city is divided, polarized and segregated. The separate wall which built by Israeli government divided the urbanized region of Jerusalem. This urbanized region is fragmented and polarized between dual ethnonational urban systems; one is Palestinians and the other is Israeli. The Palestinians urban system consist from organic unplanned hierarchy of rural and urban localities, which developed under Israeli occupation, while the Israeli urban system initiated and planned by Israeli government with help of the Jewish agency, to achieve geo-political and demographic goals, based on belonging ideology to occupied and control the space and place. The dual socio-cultural, ethno-national and different characters of the functions and landscape of the urban fabric and the morphology of the Jerusalem urbanized region as a result of planned and implemented of Israeli sophisticated hard and soft matrix of control form up to down, while the Palestinians react by organic unplanned development and urban expansion without authorized planning and official municipal managements. Most of this Palestinians in the urbanized Jerusalem region occur from down to up. This organic Palestinians developing in many case are invisible by the Israeli.

The false urbanization and informal development in Al-Qudes\Jerusalem area occurred under ethno-national and geo-political rooted conflict. This conflict still not settled between the Israeli and the Palestinians who live in the city region. The matter of this paper is to present and discuss the problematic and the complexity of the Jerusalem urban region emerge, as a result of bordering and re-bordering which lead to face a planning obstacles and barriers conflict.



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C24.38-Political Geography => Reframing Multipolarity Between Systemic and Spatial Geopolitics



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1102 - Spatiotemporal Evolution And Dual Origin Analysis Of Conflict Risk In Pakistan Based On Media Perception

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Situated at the intersection of South, Central and West Asia, Pakistan serves as a critical strategic hub linking the Middle East, the Indian Ocean, and Central Asia, and has long been subject to compounded pressures from multiple security risks. Frequent violent conflicts not only threaten national social stability but also exert profound impacts on regional security and the global geopolitical order. Based on the GDELT Global News Event Database, this study develops a conflict risk assessment model integrating communication intensity and social perception, and applies kernel density analysis, emerging spatiotemporal hotspot analysis, and social network analysis to examine the spatiotemporal evolution of domestic conflict risk in Pakistan from 2015 to 2024, while identifying the major sources of risk. The results indicate that: (1) Pakistan's domestic conflict risk between 2015 and 2024 followed a "high in the early stage – decline in the middle – resurgence in the later stage" trajectory, with a marked increase in recent years; (2) Spatially, conflict risk exhibits a multi-level gradient distribution characterized by "core city dominance – provincial multi-point dispersion – transport corridor belt-shaped penetration"; (3) Risk hotspots have shifted from "localized persistence" to "widespread expansion," with sustained hotspots observed in northeastern Khyber Pakhtunkhwa, the Federal Capital Territory and the periphery of Karachi, alongside substantial new continuous hotspots and new hotspots in Peshawar, Quetta, Lahore and Karachi; (4) International risk sources remain dominant and display a trend toward multipolarity, while domestic risk sources are increasingly diverse and complex, with a rising overall impact. The study extends event-based risk assessment methods and factor analysis pathways, providing scientific support for regional risk prevention.



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1881 - Geographies Of Energy Resources And Their Role In Constructing Geopolitical Power

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Global push for decarbonisation to combat climate change has created a platform for the states to leverage the spatiality of resources and assert power in the ways different than those in traditional power politics in the international geopolitical arena. Attempts to control Supply Chains of Critical Minerals and achieve domination in their processing capacity by states is a case in point. The central objective of this paper is to assess how spatiality of resources metamorphoses the systematic geopolitics and construct the geopolitical power. This paper also aims to study the location of multiple centres of power in the transformed world wherein the power is exercised through the control over the networks of energy resources. It thus, unfolds the energy-power nexus that has been the dominant theme of the great power politics, determining the geopolitical polarity since the beginning of the civilisation. The paper employs both quantitative and qualitative methods in the research. The study thus examines the data on export controls, quantitative restrictions and trade flows of select critical minerals to understand the shifting polarity and layered order of power in the region. Additionally, the paper incorporates the discursive analysis of various geopolitical tools such as friendshoring, plurilateral agreements and regional alliances employed by states. In doing so, paper attempts to understand the actions taken by US in the Indo-Pacific as well as in Arctic region. This study attempts to understand the link between the geographies of energy resources and strategic policies of the states to establish how power is exercised over space. It also aims to assess whether such a configuration of power allows manoeuvrability to multiple actors to exercise control and have power by leveraging their resource base. The paper shows that the nature of alliances has shifted over time from multilaterals to plurilateral agreements. Finally, this study unpacks how the alliances like Mineral Security Partnership, Regional FTAs and Bilateral agreements to exchange mineral wealth have reframed the geopolitical order, corresponding to the changed realities of the time.



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2003 - Political Territorialization Of The Western Balkans Between Balkanization And Africanization Jurica Botić¹

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The Western Balkans, as non-integrated European backyard, is perceived as a space of instability and ethno-religiously motivated conflicts. The negative perception of this area is interpreted through the prism of balkanization, or political-territorial fragmentation accompanied by conflict. Since such an approach shifts responsibility exclusively to local peoples, the article presents a broader context by linking internal and external factors. The Balkanization is joined by the concept of Africanization, explaining the influence of external forces on the formation of borders with little consideration of local circumstances. Linking Todorova's interpretation of the Balkans as a European periphery in an almost colonial relation to the centre, the aim is to compare the political-territorial particularism of the Western Balkans with other examples of political-territorial fragmentation, especially in Africa where the external factor was most pronounced. In methodological terms, a multi-criteria comparative analysis of the genesis of the political borders of the Western Balkan countries was carried out based on three criteria: historical justification, division of ethnic communities, and the external influence. The results were placed in the comparative context of the political-geographical development of Africa in order to determine the level of similarity. The article confirms the following hypotheses: first, the Western Balkan states' borders formation is to a certain extent Africanized, i.e. externally impacted without fully respecting the ethnic realities; and second, the Balkanization of the Western Balkans is a consequence of previous Africanization, i.e. a combination of externally impacted borders and consequently developed internal ethnic tensions. Unlike Africa, the political-territorial development of the Western Balkan states has a much more historical basis. However, the undeniable elements of Africanization have significantly contributed to the increase in the level of conflict in Western Balkan societies and thus directly encouraged Balkanization of this area.



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2564 - From Wars Of Choice To Wars Of Existence The New Geopolitics Of Climatic Determinism

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The transition into the Anthropocene necessitates a fundamental restructuring of security paradigms, moving from ideological “wars of choice” to resource-driven “wars of existence”. Traditional conflict theory prioritizes human political agency; however, accelerating environmental change is transforming climate from a “threat multiplier” into a deterministic force that overrides political discretion. This study hypothesizes that future geopolitical fault lines will be dictated by geographical necessities specifically water scarcity and arable land loss—rendering states increasingly passive reactors to environmental forces rather than active strategists.

This research utilizes James R. Lee’s conceptual framework of “Hot Wars” (scarcity-driven) and “Cold Wars” (opportunity-driven) to analyze the changing origins of conflict. We employ a comparative case study approach, examining hydro-climatic data, migration patterns, and military mobilization in three distinct geographical zones: the arid equatorial belt (specifically the 2006–2011 Syrian drought), transboundary river basins in Central Asia, and the melting cryosphere of the Arctic.

The analysis reveals a bifurcation in conflict etiologies driven by physical geography. In “Hot War” zones like Syria and the Sahel, climatic stressors dismantled the social contract, forcing mass migration and triggering survival-based violence over shrinking resources,. Conversely, “Cold War” zones in the Arctic demonstrate how retreating ice creates new strategic imperatives for resource extraction and navigation, forcing militarization driven by abundance rather than scarcity,. In both contexts, climatic data proves to be a more accurate predictor of strategic behavior than traditional political variables.

The era of climatic determinism demands a shift from traditional security to “Deep Strategy,” which integrates national defense planning with Earth System dynamics. As the environment transforms from a passive backdrop to an active agent of conflict, state survival will depend on adapting to biophysical realities rather than ideological projection.



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C24.39-Population Geography => Global Disasters and Public Health: Strengthening Systems for Climate Resilience



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2376 - Analysis Of Spatial Pattern And Determinants Of Child (u 5) Mortality In India At The Sub National Level.

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The socioeconomic and geographical disparities in neonatal, infant, and under-five mortality have been increasingly documented in recent years (International Institute for Population Sciences [IIPS] & ICF, 2021). India, as a vast and diverse country, exhibits significant heterogeneity in demographic, economic, and social indicators, as well as regional variations in fertility, mortality, education, and healthcare services. These disparities have led to differential exposure to diseases and varied health outcomes among children (Choudhury, 2015; Collaborators, 2010; Fadel et al., 2017; Jain, 1985; Lawn et al., 2005; Liu et al., 2012; Ram et al., 2013; Singh et al., 2011). The issue of spatial and socioeconomic inequities in under five mortality rate (U5MR) is a key public health concern in the Indian setting, which has made significant strides in improving survivability rates among children over the last few decades.

In this study, the authors seek to explore the rates of neonatal, infant, and U5 mortality rates in Indian states and districts during the post-National Rural Health Mission era based on the National Family Health Survey (NFHS-5 conducted between 2019 and 2021). Using a retrospective cohort study design, all reported live births by women aged 15 to 49 years over a period of five years preceding the survey were considered for study. survival analyses such as Kaplan-Meier estimators and Cox proportional hazard models were utilized to explore the contribution of individual and community factors toward the observed rates of survivability.

The analysis uses a full set of socioeconomic, maternal, child, and environmental variables based on the conceptual framework proposed by Mosley and Chen (1984). It took into account the socioeconomic variables of maternal education, wealth, caste, and rural residence, along with maternal age, child spacing, child nutrition, and the availability of health, water, and sanitation facilities to the mother. The Cox proportional hazards model, estimated by partial likelihood, allowed the calculation of the hazard ratio to determine the relationship between the variables and the chance of mortality, with tests for validity and goodness of fit, such as the Schoenfeld residuals, implemented to evaluate the model.



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2400 - Taking Depopulation And Super Aging Into Account In Reshaping Of Heat Exposure Vulnerability And Risk In South Korea

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South Korea has good reason to be concerned about climate change. The nation's mean temperature is getting hotter more rapidly than global and East Asian averages; over the last century (1912–2018) the average mean temperature in South Korea has increased by 1.9 °C which is 0.85 °C higher than the global average. South Korea's population is declining and its composition changing, associated with lowest-low fertility rates and rapid aging (super aging), i.e., population implosion. Such a dramatic demographic shift is not only limited to the peninsula, but also applicable in other East Asian countries as well as some Southern and Eastern European developed countries. When estimating changes in future exposure to extreme heat events (EHE), events that are predicted to be intensified due to climate change, it is important to incorporate demographic dynamics. According to IPCC, a risk is shaped by overlapping hazards, vulnerability, and exposure. This implies that assessing climate risks mandates an integrated approach rather than focusing on individual factors. Our results show that while the Seoul region has high exposure due to its large population, its vulnerability is low. Conversely, non-Seoul regions have high vulnerability but low exposure. In short, the risk patterns differ substantially. By specifically deriving these diverse spatial patterns of EHE risks, this Korean case study provides foundational data that can contribute to the development of tailored extreme heat management and policies for each region. The central and local governments must implement policies that are place-based and also consider people's characteristics for people-focused interventions.



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C24.41-Silk Road Civilizations and Environments Commission => Climate Change and Transcontinental Exchange: Drivers of Civilizational Dynamics Across the Silk Road



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1125 - History Of Human Occupation On High Latitude Plateaus And High Cold Civilization Development

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Abstract: The human occupation and social development on the High-Latitude Plateaus mark a milestone in human adaptation to extreme environments, while research on the development of civilization in high-altitude regions remains limited. Here, we review the elements of civilization, analyze the origin and formation of civilizations in high-altitude plateaus around the world, and preliminarily summarize the meaning of High-Cold Civilization and its regional evolution process. The results show that: (1) With prehistoric human colonization of high-altitude regions, 2,500 m above sea level, High-Cold Civilization formed through the development of agriculture and animal husbandry, social division of labor, class stratification, and the emergence of kingdoms and kingship. (2) The Aksum Culture in the Ethiopian Plateau, Chavin Culture in the Andean Altiplano, Nuomuhong Culture in the Tibetan Plateau indicate the dawn of High-Cold Civilization since 3500 BP in the high-could latitude plateau in the world. The Kingdom of Aksum (Ethiopian Plateau), Tiwanaku and Wari (Andean Altiplano), Tuyuhun, Zhang Zhung and Yarlung (Tibetan Plateau) revealed the formation of High-Cold Civilization since 100 CE. (3) In High-Cold Civilizations, the relatively harsh natural environment and human adaptation were prerequisites; agriculture and nomadism were the basis of origin; external communication and control of trade were the drivers of development; and the emergence of kingdoms and royal states were signs of formation. However, our understanding of High-Cold Civilization is still limited by the number of archaeological sites and excavated materials. We expect that future studies will promote understanding of key issues, such as the timing of civilization formation, social responses to climate change, and the role of High-Cold Civilizations in global civilization exchange.



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1252 - Introduction To Trans Eurasia Exchange And Silk Road Civilization Development (ates)

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The Silk Road was an exceptional landmark of continental-scale exchanges throughout human history, spanning thousands of years across the vast landscapes of the Gobi Desert, oases, mountains, basins, forests, and steppes in Eurasia. The mechanisms of early human migrations in the paleolithic periods, agriculture origin and early farming diffusion, and civilization development along the Silk Road have attracted high interest from both natural and social scientists.

The vision of ATES aims to deepen understanding of the interactions between environmental changes, long-term trans-Eurasia exchanges and Silk Road civilizations, by promoting interdisciplinary research of natural sciences, social sciences, and humanities across Eurasia. ATES is committed to advancing cross-regional, interdisciplinary research to foster a comprehensive understanding of the Silk Road's environmental, climatic, cultural, and socio-economic systems. By integrating field-based observations, diverse datasets, modelling approaches, and historical perspectives, ATES aims to generate actionable, science-based knowledge that supports sustainable development and long-term resilience across the Silk Road regions.

Key Scientific Priorities of ATES are:

- 1) Paleolithic culture and human migration
- 2) The origin of agriculture and trans-Eurasian diffusion of early farming and herding
- 3) Evolution and development of the transport network and towns
- 4) Evolution and circulation of culture, science and technology along the Silk Road
- 5) Genetic history of Silk Road populations
- 6) Human-environment-climate interactions and the impact of environmental and climatic changes on the development of Silk Road civilizations and Trans-Eurasian exchanges



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1426 - Charcoal Assemblages And $\delta^{13}\text{C}$ Reconstruct Local Human–environment Interactions In The Western Loess Plateau

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Charcoal, produced by human fire use, is an important material for reconstructing human living environments. Based on systematic furnace charring experiments, we have verified the feasibility of using charcoal $\delta^{13}\text{C}$ for paleoenvironmental reconstruction. Together with dendroclimatological studies, we further demonstrate that wood/charcoal $\delta^{13}\text{C}$ on the western Loess Plateau is sensitive to hydroclimatic (wet–dry) variability. Here, we analyze a continuous Neolithic charcoal sequence from the Gedachuan site in the Hulu River basin through taxonomic identification and $\delta^{13}\text{C}$ measurements to elucidate local human–land interactions. The charcoal assemblages and $\delta^{13}\text{C}$ suggests two drought periods in the Hulu River basin: the late Banpo to Miaodigou phase (5700–5500 BP) and Qijia period (4200–4000 BP). Integrating regional evidence for human activity, we infer that 6300–5700 BP was relatively warm and humid, when local communities practiced crude agriculture dominated by broomcorn millet alongside hunting. The drought around 5700–5500 BP likely caused forest degradation and a sharp reduction in wild resources, promoting a shift in crop structure toward higher-yield foxtail millet and the development of an intensified “millet–pig” agro-subsistence system. Although climate conditions deteriorated again during 4200–4000 BP, social resilience appears to have strengthened; people mitigated resource stress by introducing domestic livestock such as cattle and sheep. By combining charcoal $\delta^{13}\text{C}$ with taxonomic composition, this study provides a new perspective for reconstructing landscape-scale changes in human living environments and human–environment relationships.



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1451 - Reconstructing The Environmental Context Of Past Human Populations Evidence From Lake Records

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High-resolution paleoreconstructions for Western Siberia and Central Asia (WSCA) are critically important for understanding the dynamics of regional environments, which are highly sensitive to climate change. To date, multi-proxy studies of bottom sediments from more than 20 lakes across the region have been conducted, providing a robust archive of natural history since the beginning of the Holocene.

The integrated research approach combines classical methods (spore-pollen analysis, lithology, geochemistry, radiocarbon dating) with advanced techniques, including X-ray fluorescence (XRF) core scanning, and the analysis of biological proxies such as diatoms, chironomids, and ostracods. This multi-proxy framework allows for the quantitative reconstruction of key climatic parameters—specifically mean annual precipitation (PANN) and mean July temperature (TJuly)—as well as the dominant vegetation types (biomes) and plant diversity indices (alpha- and beta-diversity) throughout the Holocene.

The obtained data reveal that the Early Holocene in WSCA was relatively arid, with a significant increase in moisture occurring only around 8 ka BP. This pattern aligns the region with the climatic influence of North Atlantic processes rather than the Asian monsoon. The period of maximum humidity and forest expansion is recorded in the Middle Holocene (8.2–4.2 ka BP). The Late Holocene, including the Little Ice Age (LIA, ~1300–1800 AD), is characterized by climatic instability. Contrary to monsoonal Southeast Asia, the LIA in the study region followed a “cold and humid” scenario.

An analysis of plant diversity (phytodiversity) trends shows that its dynamics are closely linked to changes in moisture availability and landscape openness. In arid and semi-arid regions, phytodiversity increased with forest expansion and higher precipitation. Conversely, in perennially humid taiga zones, diversity rose during arid phases with the expansion of steppe and open habitats. The most significant compositional turnover in plant communities occurred at the Pleistocene-Holocene boundary, while no sharp changes in phytodiversity were observed during the Holocene itself.

These quantitative reconstructions of past climate and ecosystems provide a crucial baseline for assessing current environmental changes and modeling future scenarios in Western Siberia and Central Asia.



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1511 - Multi Proxy Records Of Climate Change In The Northeastern Iranian Plateau Over The Past 1500 Years

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The ecological environment of Asian drylands is fragile and highly sensitive to global climate change, underscoring the importance of understanding its climatic and ecological history. This study aims to fill the spatial and temporal gaps in climate and environmental records in the NE Iranian Plateau, along the Silk Road. Focusing on Lake Bazangan, we reconstruct the region's climatic history over the past 1500 years through high-resolution analyses of pollen, grain size, geochemical elements, and glycerol dialkyl glycerol tetraethers (GDGTs). The results show that during the Medieval Warm Period (MWP, 1000-1400 AD), pollen concentrations were low. Grain-size and end-member analyses indicate weakened lake hydrodynamics, while geochemical proxies indicate an oxidized, high-salinity lake environment, reflecting reduced precipitation and the driest conditions. In contrast, during the Little Ice Age (LIA, 1500-1900 AD), higher pollen concentrations, intensified lake hydrodynamics, and geochemical evidence of a more reducing, lower-salinity lake environment collectively suggest a relatively humid climate. These findings are further supported by the precipitation patterns simulated by the MPI-ESM-1-2-LR model. Model simulations indicate that precipitation variability in the NE Iranian Plateau was primarily driven by intensified mid-latitude westerlies and enhanced low-latitude moisture transport, likely modulated by the Interdecadal Pacific Oscillation (IPO). Overall, this study improves our understanding of past human-environment interactions and provide a climatic perspective for addressing contemporary environmental challenges along the Silk Road region.



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1626 - Hydroclimatic Changes And Their Socio Environmental Effects In The Western Chinese Loess Plateau Since The Tang Dynasty

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Climate change has exerted a profound impact on human activities, the reorganization of geopolitical patterns, and the evolution of ecosystems in the Western Chinese Loess Plateau (WCLP). Based on high-precision dated stalagmites from Yanwudong Cave, this study reconstructed hydrological and climatic changes at decadal to centennial scales in the WCLP over the past 1,400 years. A comprehensive analysis of stalagmite stable isotopes ($\delta^{18}\text{O}$ and $\delta^{13}\text{C}$) and trace elements (Sr/Ca, Mg/Ca, Ba/Ca) revealed that stable isotopes, affected by kinetic fractionation effects, record more complex climatic signals. In contrast, the first principal component (PC1) of trace elements shows consistent variations with regional hydrological and climatic records, thus serving as a reliable indicator of hydrological and climatic changes. The reconstruction results indicate that climatic fluctuations, together with agricultural activities, have jointly dominated the vegetation evolution in the WCLP. During the Medieval Climate Anomaly (MCA), the warm and humid climate coupled with intensified human activities may have led to a reduction in vegetation coverage. However, the abandonment of agricultural activities in the early Little Ice Age (LIA) marked a transition to a cold and arid climate, which in turn promoted vegetation recovery. Additionally, severe drought events, as documented in both historical literatures and proxy data, may have triggered geopolitical conflicts through livelihood crises. This ecological vulnerability has amplified the sensitivity of human societies to extreme climatic events, primarily manifested through crop yield reduction and forced human migration. Our records further demonstrate that the decadal to multi-decadal hydroclimatic fluctuations during the MCA were relatively mild, whereas fluctuations intensified significantly during the LIA. This pattern is consistent with the increased frequency of flood and drought events recorded in historical documents.



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2018 - Spatiotemporal Characteristics Of The 4.2 Ka Climate Event Across Eurasia And Its Implications For Early Societal Trajectories

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Reconstructing the spatiotemporal features of past climate variability and assessing its influence on societal change are essential for understanding long-term human–environment co-evolution and for informing contemporary climate adaptation. The “4.2 ka event” (around 4.2 ka BP) has long been regarded as a major hydroclimatic anomaly marking the onset of the Late Holocene and has frequently been invoked to explain major societal disruptions across multiple regions. However, expanding and increasingly detailed proxy records have challenged both the presumed global uniformity of this event and the magnitude of its societal impacts.

To address these debates, this study conducts a global transient simulation for 4.5–3.5 ka BP using the Community Earth System Model (CESM) to obtain continuous climate fields across Eurasia and to evaluate whether the 4.2 ka anomaly represents coherent regional change or spatially heterogeneous variability. In parallel, we compile archaeological cultural sequences and key regional syntheses across Eurasia, and delineate seven sub-regions based on subsistence strategies and environmental settings. By comparing the spatiotemporal pattern of climate anomalies with trajectories of social change within each sub-region, we examine plausible pathways through which climate perturbations may have shaped early societal dynamics.

Our results indicate that the 4.2 ka signal is widespread across Eurasia but is far from uniform: anomaly intensity, persistence, and hydroclimatic expression exhibit pronounced spatial heterogeneity. Such heterogeneity implies region-specific societal consequences, ranging from amplified stress and risk accumulation in some socio-ecological settings to the reorganization of resources and interregional connectivity in others. These differential impacts may have contributed to divergent developmental pathways among early societies, including those in early China, the Harappan world, Mesopotamia, the Mediterranean, and the Eurasian steppe. Overall, our findings underscore the need to move beyond deterministic “collapse vs. flourishing” narratives and toward process-based, regionally explicit mechanisms linking climate variability and social change.



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2055 - Glacial And Snow Meltwater Irrigation Supported The Rise Of Barley–wheat Farming On The Tibetan Plateau

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Around 3,000 years ago, barley and wheat replaced millets as the dominant crops on the Tibetan Plateau (TP), with naked barley (qingke) becoming particularly widespread in high-altitude areas. This agricultural transition occurred over a millennium earlier than in the Central Plains of China, yet its underlying drivers have remained poorly understood. Barley–wheat agriculture originated in the Mediterranean region, which features humid winters and springs. Its spread into the East Asian monsoon climate—characterized by dry winters and springs—posed significant challenges due to water scarcity during key growth stages. Unlike the Central Plains, where large-scale hydraulic engineering was developed for irrigation, the TP is endowed with extensive mountain glaciers and snow cover. These act as natural, stable reservoirs, supplying meltwater to downstream foothills and valleys, thereby providing a consistent water source for farming. To evaluate the role of meltwater irrigation in facilitating barley–wheat cultivation, we conducted systematic field experiments across different rainfall zones in the Yarlung Tsangpo River Basin—the core agricultural region of the TP. We established a clear relationship between irrigation frequency and $\Delta^{13}\text{C}$ values in wheat and barley grains. Our results demonstrate that irrigation significantly improves crop agronomic performance, and that $\Delta^{13}\text{C}$ values correlate positively with irrigation levels under similar precipitation conditions. Wheat $\Delta^{13}\text{C}$ showed greater sensitivity to irrigation than qingke barley. By integrating modern experimental data with AMS radiocarbon dating and $\Delta^{13}\text{C}$ analysis of archaeobotanical grains from regional sites, we provide evidence that early farming communities on the TP had already begun utilizing glacial and snow meltwater for irrigation by at least 3,000 years ago. This distinct hydrological resource likely played a foundational role in sustaining and promoting the spread of barley–wheat agriculture across the high-altitude Tibetan Plateau.



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2338 - River Dynamics And Human Adaptation Investigating The Co Evolution Of River Channels And Ancient Cities In Xinjiang China

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Rivers have long been pivotal to the rise and fall of civilizations, particularly in arid regions where water resources dictate human settlement and survival. This study focuses on the Weigan River Basin, a key oasis along the ancient Silk Road, to reconstruct the late Holocene river channel changes and their interactions with human-environment dynamics in ancient cities. To achieve these objectives, the research employs a multi-scalar and interdisciplinary methodology. At the regional scale, Landsat and Sentinel satellite imagery, combined with digital elevation models (DEMs), are used to identify paleochannels, alluvial fans, and abandoned river courses. By integrating historical documents, remote sensing analysis, chronological dating, and multi-proxy environmental archaeology, we aim to: 1) establish a precise spatiotemporal sequence of river channel shifts; 2) reveal human adaptive strategies reflected in subsistence patterns, craft production, and resource utilization at the Wushikate Ancient City; and 3) clarify how riverine changes drove urban rise and fall and cultural transformations.

Our preliminary findings indicate close correlations between river avulsions, water resource accessibility, and the prosperity or decline of ancient settlements. This research not only fills gaps in understanding arid zone human-environment interactions but also provides insights into climate change impacts on transcontinental civilizational dynamics along the Silk Road. The outcomes will contribute to sustainable water management and cultural heritage preservation in modern arid regions, shedding light on how ancient societies in the Weigan River Basin navigated environmental uncertainties and ultimately shaped their cultural trajectories.



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2339 - Reconstruction Of Moisture Changes Since The Last Interglacial Using Organic Carbon Isotopes From Loess–paleosol Sequences In Northeastern Iran

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Arid Central Asia (ACA), a region predominantly influenced by the mid-latitude westerlies, constitutes a crucial segment of the ancient Silk Road and is characterized by persistent drought, scarce precipitation, intense evaporation, and fragile ecosystems, making the moisture change extremely important to the regional ecological diversity and civilization evolution. Although previous studies indicate an anti-phase relationship between moisture changes in eastern ACA and the Asian monsoon region during the Holocene, and an out-of-phase relationship during the Last Interglacial, hydroclimatic evolution in western ACA remains disputed, limiting a coherent regional synthesis. To address this gap, this study reconstructs climate change since the Last Interglacial using the TS19 loess–paleosol sequence in northeastern Iran, supported by a robust chronology derived from 52 K-feldspar and 28 quartz OSL ages. Precipitation variability is primarily inferred from organic carbon isotopic composition ($\delta^{13}\text{C}$), supplemented by chromaticity, magnetic susceptibility, and total organic carbon. The results indicate (1) a progressive increase in moisture from the early to late Holocene in northeastern Iran, contrasting with a persistent Holocene drying trend in northwestern Iran, implying an east–west anti-phase pattern; (2) a notably humid Last Glacial Maximum (26.5–19 ka), consistent with TRACE-21 simulated changes in mean annual precipitation; and 3) maximum wetness during MIS 5c (108–92.5 ka), differing from many records elsewhere that identify MIS 5e as the wettest interval. These anomalous patterns during the LGM and within MIS 5 may be linked to shifts in the position and intensity of the westerlies, with Caspian Sea level variations potentially exerting additional influence, although further work is required to clarify the underlying mechanisms.



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C24.43-Joint ICA/IGU Commission on Toponymy => Geographical Names in the Tension Field Between Communicative Function and Political Appropriation



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1151 - The Problems With Endonymic Country Names Whose General Use Is Required By Donor Countries

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Country names are classical examples of place names predestined to be used as exonyms by various receiver languages. They refer to prominent features frequently addressed by receiver languages with a usually longer historical continuity so that identification with historical references is useful, and they need to be transformed into inhabitant names and adjectives. Exonyms have anyway only emerged for countries historically or politically very important for receiver communities, while for younger and for receiver communities less important countries the endonym is used. More recently, however, some countries with traditional exonyms wish to have their country name used in all contexts in the endonym form, also in international communication and by all receiver languages: Turkey [Türkiye], Belorussia [Belarus], Ivory Coast [Côte d'Ivoire], and Swaziland [eSwatini].

After some general remarks on the endonym/exonym divide and the benefits of using exonyms the paper discusses the problems arising from using the endonym version of the country names in question in the context of receiver languages such as (1) difficulties with correct pronunciation; (2) difficulties with derivations like inhabitant names and adjectives; (3) lack of coincidence with older sources; (4) probability of repeated politically motivated changes; (5) discrepancy between the right of receiver languages on defining their exonyms and the demand of donor countries to use the endonym resulting in the fact that in ordinary receiver language communication anyway the traditional exonym is used while endonym use is confined to diplomatic and highly official communication and remains widely unknown by a wider public; (6) parallel use of endonymic and exonymic versions even in the donor country. The paper asks also for the motives of donor countries to require the exclusive use of endonymic forms.



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1400 - Discrepancy In The Use Of Official And Unofficial Geographical Names Examples Of Names Of Countries Squares And Streets In Croatia

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Background

In Croatia, some officially named geographical objects are also referred to by unofficial, vernacular, widely accepted names—not only in public but also in official communication—resulting in polyonymy. This presentation examines the relationship between official and unofficial yet accepted names of selected geographical objects.

Materials and methods

The names of countries, squares, and streets have been analysed using exemplary and comparative methods. The primary sources include the official list of country names and the website of the Ministry of Foreign and European Affairs, the list of countries and dependent territories of the Croatian National Bank, the reference book Croatian Exonyms, documents on the naming and renaming of streets and squares, and reliable online sources.

Results

Selected examples of country names reveal inconsistent practices in official Croatian-language communication, even though official communication formally requires the use of official names. Shorter Croatian forms of country names are sometimes used in official contexts instead of the prescribed official names, particularly for countries that request the use of their original names in Croatian. The use of original country names further complicates the formation of adjective forms and ethnonyms, and these are therefore either avoided or replaced with uneconomical descriptive terms. Examples of street and square names likewise demonstrate inconsistency and polyonymy in the use of official and unofficial names, even when the latter have long been in use within the local community.

Conclusions

Inconsistency and name multiplicity in the use of official and unofficial names of countries, squares, and streets in Croatia primarily arise from externally driven political decisions (when a country demands the use of its original name) or top-down measures (when authorities rename streets and squares while disregarding well-established vernacular names). Greater respect for natural language development and widespread usage of accepted names would prevent such situations and ensure unambiguous communication.



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1862 - The Role Of Place Names In A Proposal And Vote Naming Process

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Background and Purpose

This presentation examines the public call for proposals and voting process through which a new place name was adopted in Fuji City, Shizuoka Prefecture, Japan. The Sandomaki district was developed for residential use through a land readjustment project implemented from the 2000s to the 2020s. The name “Sandomaki” was established in 2020 as the official name of the administrative area upon completion of the project. The name was selected through a vote by landowners and residents. Prior to the vote, Fuji City invited proposals for a new place name from local residents; a workshop composed of landowners then narrowed the submissions to five finalist names for the vote. This presentation aims to analyze this process—branded as the “New Place Name General Election”—to explore the roles and values associated with place names in contemporary society.

Methods

This case is distinctive in that local residents were directly involved in the official establishment of a place name, and this direct involvement appears to reflect the local administrative authorities’ contemporary stance toward place naming. Accordingly, this presentation reports findings from interviews with both municipal officials and residents.

Conclusions

In the conclusion section, this presentation suggests that place names matter not only as locational indicators or administrative labels but also as significant elements in place-making and community formation. In particular, it discusses (1) the significance the new place name came to hold for residents through the process of proposal submission and voting, and (2) the significance for the administrative authorities responsible for place naming of introducing this participatory procedure. Finally, it offers an outlook on how this democratic approach to deciding place names—through proposal submission and voting—may shape future practices of place naming.



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1983 - Who Suffers Most Without Standardized Place Names Evidence And Observation From Japan
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This paper examines the struggles and confusions of teaching geography in Japan without standardized place names in secondary education system and institutions that surrounds them. In Japan, where the national language (Japanese) use three types of characters (Kanji as Chinese characters in written forms; Hiragana as Japanese characters based on sound; and Katakana to incorporate foreign words into Japanese based on sound), there are multiple ways to write foreign place names, and that often leads to confusion (i.e. Wuhan as Katakana, Bukan as Hiragana, or □□ as Chinese characters). Additionally, there are place names which are common within Japan but not at places of origins (i.e., Igrisu as UK but is not recognized neither within England nor UK). Furthermore, some place names have been used differently for many decades among subjects (i.e. Geography and World History). What is worse, there are place names that are written differently among geography textbooks. This have created enormous confusion among students, teachers, parents, and cram schools that help students to advance their levels and pass college entrance exams.

Ironically, with rise of the Internet and the digital, how one specifies certain place names can be influenced by how they are described on the web (i.e. Google Maps). Meanwhile, Japanese government have recently established Digital Agency to digitalize all sorts of information. Unfortunately, however, it has not paid careful attention to how they deal with place names. Likewise, Japanese government has not recognized such circumstances.

While it is true that Japan is not the only country that does not have institution to standardize place names, this paper argues that it brings confusion to learners and instructors as well as those who are involved in publicizing place names. This paper argues that standardizing place names are essential to forming unified geographical knowledge.



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2187 - Parlez Vous Français What Does The Polish Public Space Tell Us About International Relations

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This presentation attempts to characterize the traces in Polish public space that indicate Polish-French connections. In an era of intensifying Polish-French cooperation and the significant role France plays in European politics, the analysis of French traces in Polish public space takes on particular importance. We often fail to realize how deep the historical ties between Warsaw and Paris are, and how many cultural elements we share with France, both in everyday urban landscapes and in symbolic representations of the past.

The study is based on three main axes of analysis. First, the presentation presents maps compiled during archival research, showing street and square names as well as monuments commemorating French historical figures or otherwise linked to France and Polish-French relations, with particular attention to their spatial concentration and visibility. Second, the presentation includes an analysis of the spatial distribution of French language instruction in Polish schools, treated as an indicator of contemporary cultural and educational links. Third, it presents the results of an inventory of sites of historical significance for Polish-French relations, ranging from places of diplomatic activity to locations associated with migration and exile.

The presentation constitutes an attempt to comprehensively map the French presence in Polish public space, aiming to contribute to a better understanding of the nature of contemporary Polish-French relations and the ways in which they are inscribed in the urban fabric.



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2272 - Towards A Comprehensive Solution To Place Name Issues In Japan A Triadic Approach Of Shared Governance Place Name Database Development And International Collaboration

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Background and Purpose

In Japan, responsibility for place names is fragmented between central ministries and local authorities, resulting in a lack of unified policies and standards. This has led to issues such as the commercialisation of place names, the disappearance of historical and cultural designations, confusion in notation systems (including kanji and romanisation), and international inconsistencies.

This paper outlines the current state and challenges in place naming, management, and notation in Japan, proposing a policy framework for establishing sustainable place name governance.

Methods

Particularly since the large-scale municipal mergers of the Heisei era (1999-2010), the proliferation of incongruous new place names and debates surrounding the sale of naming rights have highlighted anew that place names embody both public interest and cultural value.

Furthermore, despite the urgent need for standardisation and sharing of address and place name data following the establishment of the Digital Agency, inter-ministerial coordination remains inadequate. This presentation reports on these current conditions, including specific case studies.

Conclusions

Internationally, the establishment of specialised place name agencies and standardisation have become commonplace, with frameworks for international cooperation also in place. However, Japan lacks a permanent public-private-academic partnership organisation dedicated to addressing place name issues. This presentation proposes the following three strategies: (1) establishing an interdisciplinary organisation to comprehensively handle place name naming and notation, and cultivating specialised personnel; (2) standardising and digitising address notation and developing GIS-linked place name indexes; (3) actively participating in international discussions and reflecting outcomes in domestic policy.

Furthermore, it argues for the necessity of place name governance that balances the protection of historical names with international compatibility.



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2393 - Names Of Sports Venues As Local Landmarks With Global Outreach An Analysis Of A Socio Discursive Model;

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If you search the internet for travel destinations of the city of Arlington, Texas, glossy pictures of the city's two flagship stadiums appear: the venerable Globe Life Field, home to Texas Rangers, and state-of-the-art AT&T Stadium, home to Dallas Cowboys (Arlington, Texas).

Due to this positioning as a sports city, there was great excitement in Arlington when the state-of-the-art AT&T Stadium was selected as one of sixteen venues for the 2026 World Cup. However, this excitement quickly faded when it was announced that, in accordance with FIFA regulations, the stadium would have to be renamed Dallas Stadium during the World Cup. As the mayor Jim Ross stated: "It's not a dig against Dallas (...). It's just essential pride of the city of Arlington and what we have accomplished here in our entertainment district ... It's also an economic impact and we want to optimize our ability to take advantage of that" (Miles, 2025).

This quote underscores the idea of 'glocalisation' in sports (Giulianotti & Robertson, 2004) combining local pride and a 'sense of place' (Bale, 1991) as well as the attempt of global exposure in order to enhance the economic impact. Furthermore, sports venues and their names are part of the urban (linguistic) landscape (Rose-Redwood et al., 2019), which shapes not only the contemporary image of an urban landscape this but also that of the future (Vuolteenaho & Berg, 2009). Finally, the names of sports venues depend on pressure groups such as (local) fans, the history of the stadium itself, including its former (iconic) names (Bach et al., 2022).

Based on a dataset extracted from the web (~5,000 names) and a multilingual online survey that we have been conducting since September 2025 as part of the DISCLOSE research project (2022-2025), our proposal aligns with the section on Geographical Names in the Tension Field It aims to create interactive maps illustrating naming practices around the world and to analyse how supporters evaluate them.

Preliminary results show that (re)naming practices and their acceptance by pressure groups fluctuate between commercialisation, which is accepted as necessary, and a desired identity-forming sustainability based on local geo-cultural features.



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C24.44-Transport Geography => Advancing the 15-Minute City and Transport Geography Research Through Perspectives of Scale



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1066 - Dynamic Scales Of Geriatric Emergency Medical Services In The Fifteen Minute City

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Background/Hypothesis

The fifteen minute city has been widely adopted as a planning ideal, yet the notion of a single temporal or spatial threshold may obscure multi-scalar inequalities in access to critical services. This study uses the national target that emergency medical services should reach patients within fifteen minutes to examine how accessibility for older adults varies across spatial and temporal scales in a rapidly growing Chinese metropolis.

Materials and Methods

Zhengzhou, China, is used as a case study. A dynamic optimal allocation model is developed that integrates real time traffic speeds, emergency medical station locations, capacity and surge capacity, and the residential distribution of older adults. Accessibility and spatial equity are assessed across three spatial scales (city, district, neighbourhood) and four time periods on workdays and non workdays (morning peak, evening peak, off peak, night).

Results

The analysis reveals a pronounced but time dependent core–periphery gradient at the city scale. At the district scale, accessibility is consistently higher in central, infrastructure rich districts and lower in peripheral districts. At the neighbourhood scale, sharp intra district inequalities emerge between commercial housing, resettlement housing and public rental housing, with some high price developments also functioning as blind spots for emergency medical services. City level averages suggest progress towards the fifteen minute city, but mask persistent multi scalar inequities for older residents.

Conclusions

The findings demonstrate that the fifteen minute city cannot be understood through a single fixed scale. Instead, accessibility emerges from dynamic interactions among transport networks, congestion, housing markets and population ageing. The study shows how multi scalar, time dependent modelling can advance both transport geography and fifteen minute city research and highlights the need for coordinated governance of emergency medical services across administrative levels to support a more just urban transition for older adults.



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1279 - The Re Infrastructuration Of Small Railway Stations In Europe Network Scales Functional Services And Territorial Values

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Living within 15 mn means getting close to a public transport facility.

In Europe, the remnants of 19th century extended railway network, even in rural and suburban regions, have provided a potential system of mobility. Yet, in western Europe, small railway stations used to represent an infrastructural burden and many were axed since the 1960's. In Eastern Europe, the expansion of car for the last 20 yrs has also caused a neglect of local lines and a massive trend of small station decommission and conversion.

This historical sequence is having its U-turn. As residential peripheries have extended and diffuse urbanization trends affect many parts of EU territories, conventional lines support a growing passenger load or freight traffic increase. For this reason, they interest rail operators who are entering the railway market and want to renew the competency system (in terms of prices, of service and of travel experience). Small stations are no longer in the shadow : how they are accessed from the network and from the territory and how they connect with both is of prime importance and no more a matter of decommissioning or only heritage conservation. Small stations are being redefined, revalued, replanned and redeveloped. In the next decade, they will undergo further material and symbolical processes of formal renovation, functional diversification, re-institutionalization, imagification, assetization and politicization.

But the “stock” of small stations is not well identified. The difficulty comes from the fact that there is not one single definition of what “smallness” means among various Eu and national railway companies and administrations. The communication raises a methodological reflection on scales and introduces the variegated criterias of station « smallness ». It shows the complexity of adapting a station's segmentation that was conceptualized in the context of the european high speed era. It introduces the way railway stakeholder modernize this ladder and weighs the importance of territorial and network accessibility, service provision, present and potential traffic and local adherence in order to shape a definition of small station that can fit to this continent and maybe at the global level.



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1535 - 15 Minute City And Beyond Linking Local And Regional Accessibility With Urban Vitality

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The 15-minute City concept has recently gained prominence, reigniting the debate on the ideal urban form and the importance of local versus regional accessibility in promoting vibrant cities. Our study contributes to this scholarship by exploring the relationship between local and regional accessibility and urban vitality. Using Hong Kong as our case study and the number of restaurants as a proxy for urban vitality, our research employs mixed-effect models to investigate these dynamics. Our findings validate the 15-minute City concept by identifying a positive correlation between local accessibility and urban vitality. Additionally, through a quasi-natural experiment approach enabled by the closure and resumption of cross-boundary borders between Hong Kong and Mainland China, we identify a weak (2%) positive impact of regional accessibility on vitality. The results also reveal a synergistic effect. Areas that excel in both local and regional accessibility witness an increase in restaurant numbers. Conversely, high regional access cannot compensate for poor local access. These findings suggest that local accessibility plays a more significant role than regional accessibility in shaping urban vitality, but enhancements in regional connectivity are still beneficial, as they can drive further economic growth where good local accessibility exists. Our findings underscore the necessity for cities globally, irrespective of their population density or existing transit infrastructures, to implement holistic development strategies that enhance accessibility both locally and regionally.



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1612 - Beyond Walking Multiscalar Public Transport Accessibility In The 15 Minute City Framework – Evidence From Warsaw

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The 15-minute city (FMC) concept is now a leading framework for urban development focused on sustainability and proximity. Most research prioritises walking and cycling at the neighbourhood scale. However, it often overlooks the role of public transport in big, polycentric metropolitan areas. This study extends FMC research by exploring scale and examining how pedestrian and rail-based public transport together influence 15-minute employment access.

This study uses Warsaw as a case study. It combines detailed pedestrian network modelling with metro and tram systems to evaluate job accessibility through multiple modes. Accessibility is measured with cumulative opportunity indicators and allocation models that consider worker-workplace competition. The study examines four scenarios: walking only, walking plus tram, walking plus metro, and a fully integrated network. Accessibility results are mapped on a 100-metre grid. Spatial inequality is assessed using Lorenz curves and the Gini coefficient.

Findings show that viewing the 15-minute city solely as a pedestrian space underestimates accessibility in cities. Walking alone provides adequate access only in central districts. Adding tram and metro services significantly expands access in 15 minutes, especially in peripheral and post-socialist areas. The integrated scenario greatly reduces inequality in job accessibility. It highlights the complementary roles of high-speed metro corridors and dense tram networks across urban scales.

These results suggest reconceptualising the 15-minute city as a multiscalar accessibility framework. Public transport should mediate between local proximity and metropolitan labour markets, rather than operate solely at the neighbourhood level.

The presented method and dataset were developed for the data-based research project funded by the National Science Centre under grant number 2023/51/D/HS4/00266, and also incorporate data from grant number 2024/53/B/HS4/00626.



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1893 - Measuring Barrier Free Accessibility To Public Service Facilities At The Pedestrian Segment Scale A Case Study Of Siping Road Subdistrict Shanghai

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Background / Hypothesis:

The 15-minute city and community life circles are widely used to examine the spatial equity and accessibility performance of daily travel. However, existing research predominantly relies on conventional network metrics at the community or neighborhood level, overlooking the accessibility conditions of pedestrian paths and the mobility differences among diverse population groups. This simplification often leads to a systematic overestimation of accessibility levels for people with restricted mobility. This paper proposes an accessibility assessment framework for public service facilities in life circles, based on the measurement of pedestrian path accessibility conditions, aiming to advance the methodological application of the 15-minute city concept in transport geography research.

Materials and Methods:

Taking Siping Road Subdistrict in Yangpu District, Shanghai, as a case study, this research constructs a residential–public facility pedestrian network at the life-circle scale based on real walking routes. The analysis integrates Points of Interest (POIs) from Amap, actual pedestrian routing data obtained via the Baidu Map API, and fine-grained spatial data on sidewalk barrier-free facilities. Distinct walking speeds and impedance parameters are assigned to able-bodied pedestrians, visually impaired individuals, people with physical disabilities, and older adults. Segment-level delay coefficients are introduced to quantify the impacts of accessibility barriers such as missing tactile paving, steps and ramps, slopes, and signalized intersections.

Results:

The results reveal substantial accessibility disparities among population groups that are largely concealed by conventional accessibility indicators. Pedestrian-level barriers along walking routes significantly reduce effective access to public service facilities for people with mobility constraints, even within nominal 15-minute life circles. Areas previously assessed as well-served show pronounced accessibility deficits once barrier-free conditions are considered.

Conclusions:

By linking pedestrian segment–scale barrier-free environments with life-circle–scale accessibility assessment, this study proposes a transferable multi-scale analytical framework for advancing 15-minute city and transport geography research. The findings provide empirical evidence to support more inclusive planning and design of community public service facilities and pedestrian systems.



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2079 - Evaluating Effects Of Proximity Planning On Climate Change Policies. A Comparative Analysis In Barcelona And Palma (Spain).

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Background/hypothesis

15 minutes city concept has arisen as a new framework in urban and mobility planning. Promoting proximity is a way to reduce the impacts of long-distance trips, as far as they can be replaced by cycling or walking; or simply avoiding unnecessary trips enhancing accessibility. Including proximity concepts in urban planning involves social, economical and environmental issues; and involves infrastructure and physical planning, strategic decisions to promote changes in accessibility or tackling social issues to avoid gentrification or spatial segregation.

In environmental terms, proximity policies are good instruments to go forward in terms of reducing GHG emissions, or improving air quality. In recent years, proximity visions have been included in the urban and mobility plans, as is the case of several cities in Spain. However, proximity planning measures are so often applied at a local scale, so their real impacts can be more diffuse at a metropolitan or regional scale. The city of Barcelona and its superblock model is an emblematic example of how proximity planning is deployed. The city of Palma has also included several proximity planning measures in its urban and mobility plans.

Materials and methods

The aim of this research is to evaluate the effects of proximity planning in the climate change factors comparing both cities. To this end, an analysis of the decisions related to proximity planning in the recent years is being done, using document analysis. To evaluate the effects of the measures over GHG emissions, mobility data at district level provided by the Spanish Transport Department, are used, in order to evaluate the changes in modal share and other mobility issues.

Results and conclusions

Using mobility data, a comparison between the areas where and where not proximity measures have been implemented is done, in both cities. Differences regarding climate change issues, and the role of proximity planning measures in those differences, are determined.



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2208 - The 15 Minute City Through A Time Geographical Lens Understanding Multi Scale Mobility Patterns

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¹

This study highlights the relevance of Hägerstrand's time-geography for understanding the interactions between local, city-wide, and regional mobility levels in international mobility research. By integrating time-geographical concepts with the 15-minute city planning model, it examines how individual mobility patterns and daily routines intersect with spatial boundaries across multiple scales. The 15-minute city is presented not as a static planning tool but as a contested, adaptive concept that helps to understand mobility challenges in diverse socio-spatial contexts. This perspective emphasizes the central role of temporal dimensions in mobility research and offers a novel lens for exploring how multi-scalar mobility contributes to addressing global challenges in sustainable mobility transitions.

Empirically, the study draws on a case study of Chelyabinsk, Russia, examining commuting patterns across multiple spatial scales. The analysis is based on computer-assisted personal interviews (n = 667) conducted in February 2020 as part of the Oxford Russia Fellowship 2019–2020. A typology of commuting practices was developed, differentiated by residential location and mobility level. The findings highlight how spatial scale and temporal constraints jointly shape everyday mobility practices. Overall, the study contributes to transport geography by demonstrating how a time-geographical, scale-sensitive approach can enrich debates on the 15-minute city and sustainable mobility transitions. It provides new insights into the dynamic interdependencies between local, city-wide, and regional mobility systems and supports the development of more integrated, human-centered transport and urban planning strategies.



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2285 - The “psychological Scale” Of Proximity Exploring 15mc Travel Behaviour Patterns Through Human Centric Connectivity In Liverpool City Region

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Background/Hypothesis The 15-Minute City (15MC) model often conflates physical proximity with effective accessibility. Drawing from a “Scalable Proximity” framework, we argue that proximity is a “Psychological Scale”- a cognitive threshold where factors like navigational friction and sensory environment determine a user’s functional reach. We hypothesise that a “just transition” requires shifting from system-centric physical connectivity (infrastructure connecting scales) to person-centric proximity (perceived connectedness). Even with high physical connectivity, psychological barriers can “expand” perceived distance. Conversely, in areas with insufficient infrastructure, the physical lack of transit creates a foundational barrier that the psychological scale further exacerbates, reinforcing car dependency.

Materials and Methods This hypothesis is tested via a summer pilot study in the Liverpool City Region (LCR). A team of researchers will first categorise audit sites into “Transit-Rich” and “Transit-Poor” territories. The methodology employs a Psychological Proximity Questionnaire to quantify navigational ease across multi-scalar thresholds: from local street-level access to metropolitan transit hubs. Sampling targets diverse everyday user profiles, categorising participants by travel frequency and mode familiarity. This approach identifies how varying levels of infrastructure provision influence the “user scale” and their perceived transition between neighbourhood and city regional networks.

Results The pilot expects to demonstrate that “Scalable Proximity” is achieved only when infrastructure and psychological comfort align. We anticipate findings will show that in transit-poor areas, the psychological distance to the region is vast, while in transit-rich areas, fragmented nodes can still create a sense of isolation despite physical proximity.

Conclusions We conclude that 15MC policy must be differentiated by infrastructure level. By establishing the Psychological Scale as a planning metric, urban policy can bridge the gap between infrastructure and the person, ensuring polycentric regions feel proximate for all.



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2482 - Decomposing The Concept Of 15 Minute City In High Speed Rail Station Areas An Empirical Study Of Shanghai

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Over the past two decades, Chinese cities have constructed or upgraded a significant number of high-speed rail (HSR) stations. Local governments aim to use the HSR stations as the potential catalysts to promote integrated urban development. HSR stations are also seen as core spaces for urban life and access to public services, and they should also adhere to the principles of the 15-minute city (15MC) framework. However, China's HSR new town areas often encounter challenges such as underdeveloped commercial and business functions, incomplete public service facilities, and a lack of spatial vitality, which hinders residents' access to essential urban functions and living services. This study empirically investigates this disjuncture by decomposing the 15MC concept in the context of HSR station areas, using Shanghai's nine operational stations as a case study. The Origin-Destination (OD) Cost Matrix and Gaussian-Based Two-Step Floating Catchment Area (G2SFCA) model were utilized in this research to assess the 15MC performance of the nine HSR stations. The results were as follows: (1) The morphologies of HSR areas are fragmented and star-like, contrasting sharply with the permeable and blob-like networks of traditional city centers. (2) The amount and density of the HSR station areas are lagging behind the city center areas. (3) The 15MC performance index confirms that most of the station cores function as amenity deserts. The subject of this research is to explore the differences between the HSR station area and the city center areas in realizing the 15-min city concept. This paper also calls for policy shifts toward human-scale integration, functional rebalancing, and breaking the superblocks to achieve true integration and fusion of HSR station and the adjacent urban development.



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2582 - Delineating Bespoke Neighbourhoods Based On The Use Of Urban Amenities Using Mobile Phone Data

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Background

A call for the 15-minute city has been developed in many cities worldwide, yet the X-minute standard is operationalized inconsistently across contexts. To address this, we introduce bespoke neighbourhoods—ego-centred neighbourhood units delineated for each mobile phone user based on urban amenity use around home and workplace/education anchors—to provide a behaviourally grounded unit to evaluate X-minute city performance and equity.

Materials and methods

Using anonymized mobile phone data in Nanjing, China linked with data of point of interests and individual socioeconomic attributes, we infer each user's home and workplace/education anchors and identify amenity visits. We delineate bespoke neighbourhoods as ego-centred areas defined by sliding street-network distance thresholds around both anchors, and summarise amenity use as accumulated proportion curves by income and age. Spatial access within these ranges is quantified by use-weighted density, proximity and diversity indicators within 15 minutes by walking and bicycle, respectively. The access–use associations are estimated via functional data analysis with adjusting for individual-, household- and district-level covariates.

Results

We identify significant distance decay in amenity use and clear home–workplace contrasts in bespoke neighbourhood units. Around home, 58% of observed activities occur within 1 km and 70% within 3 km, whereas the corresponding shares around workplace/education anchors are lower (39% within 1 km and 56% within 3 km). Low-income users and adults aged 60+ concentrate a larger share of activity near home. As distance from home increases, neighbourhood use becomes more equal across income groups, while income-based disparities widen with increasing distance from the workplace/education anchor.

Conclusions

Bespoke neighbourhoods, delineated from observed amenity use, can fully reflect individuals' activity spaces. Beyond home-based neighbourhoods, workplace/education-centred areas are also major arenas for daily activities and the (re)production of economic inequalities.



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C24.44-Transport Geography => Geographies of High-Speed Rail



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1618 - Geographies Of High Speed Rail What We Have Learned From 60 Years Of Operation

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Background/Hypothesis

High-speed rail (HSR) has grown very rapidly since the first high-speed line was built in Japan in 1964. HSR is today an important mode of intercity passenger transportation in a growing number of countries. This presentation summarizes how geographical factors have influenced where HSR is operating, as well as the effects of HSR on places where it has been developed.

Materials/Methods

The basis for this presentation is the Geographies of High-Speed Rail book. This edited volume features contributions from international geographers across thematic topics and regional case studies.

Results

Most of the 16 countries with HSR have developed economies with higher rates of urbanisation. This is particularly true for HSR countries in Europe and East Asia. Nevertheless, a few countries with developing or transitional economies in the Middle East, Northern Africa and Central Asia have commenced HSR service. Several of the pioneers of HSR technology, such as Japan, France, Germany, Spain and China have been successful in exporting this technology to other HSR countries, including South Korea, Taiwan, Turkey, Saudi Arabia, Morocco, Uzbekistan and Indonesia.

Important factors that influence decisions to build HSR are rooted in economics, politics and social concerns. Debates over whether to develop HSR systems are subject to economic evaluations, including methods such as cost/benefit analyses and econometric models. Prestige, competition, unification and environmental sustainability are among the political and planning elements that persuade leaders to pursue HSR. Economic geography studies have shown that benefits tend to accrue to those cities and areas within cities directly connected to HSR. In addition to economic impacts, HSR has affected intermodal travel patterns, natural environments and social equity.

Conclusions

HSR has become an important mode of intermediate-distance passenger transport. Geographical perspectives are critical in understanding HSR and its impacts.



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2261 - Structural Evolution And Driving Mechanisms Of China's Intercity High Speed Rail Connectivity Network

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China's high speed rail services have rapidly expanded since 2008 and reshaped intercity connectivity as a network. Existing studies often describe network structures at a single time point, while evidence on how intercity high speed rail connectivity structures evolve and what mechanisms drive their formation remains limited. This study examines the structural evolution and driving mechanisms of China's intercity high speed rail connectivity network.

We construct city level networks for 337 cities in mainland China for 2008, 2013, 2018, and 2023 by aggregating station level timetable services to the city level. Edge weights are defined as intercity connectivity based on daily service frequency and minimum travel time between city pairs, following a weighted formulation that combines frequency and travel time with equal importance. Because temporal exponential random graph models are estimated on binary networks and direct binarization of weighted networks may retain weak links, we extract statistically significant backbones using the disparity filter and then binarize the resulting networks for model estimation.

A temporal exponential random graph modeling framework is used to test endogenous structural mechanisms and exogenous contextual mechanisms simultaneously. The endogenous results indicate a non random formation process in which preferential attachment and triadic closure jointly contribute to a hierarchical and hub oriented structure, and temporal dependence is strong, with stability significantly positive and variability also positive, suggesting both path dependence and active path creation. The exogenous results show clear regional selection and relational embeddedness mechanisms. Cities with larger economies, higher urbanization, a higher share of the tertiary sector, and higher administrative level are more likely to be integrated into the network. Connectivity is more likely between cities with similar levels of economic development and urbanization, while industrial complementarity and administrative hierarchy facilitate connections across different city types. Shared provincial affiliation, urban agglomeration membership, and railway bureau affiliation significantly increase the likelihood of intercity connections, and geographic distance shows a significant distance decay effect.



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C24.44-Transport Geography => Harnessing Multi-Source Spatial Big Data & GeoAI: Advancing Mobility, Health, and Sustainability in Urban Futures



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1118 - Differences In Spatial Patterns Of Inter City Travel From The Perspective Of Traffic Networks New Energy Vehicles Versus Fuel Vehicles

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Investigating the spatial pattern differences in inter-city travel between new energy vehicles (NEVs) and conventional fuel vehicles (FVs) is essential to evaluate the progress of NEV adoption and enhance their penetration in long-distance travel. To distinguish NEVs from FVs and overcome the limited research on their differences, we used big data from an expressway online toll collection system to differentiate vehicle types based on license plate numbers. Through complex network analysis and random forest algorithms, we constructed separate NEV and FV networks and systematically compared their network topologies, high-frequency travel areas, and key influencing factors. The findings were: (1) Inter-city travel scale and distance decay range. NEVs emerged as significant competitors to FVs. Our analysis revealed an average travel volume ratio of 1:3.5 between NEVs and FVs. Furthermore, we evaluated three distance decay function models, namely, Lognormal, Power, and Exponential, by fitting them to the NEV and FV flow data. The spatial interaction distance for both vehicle types predominantly falls within the 40 km range. (2) Spatial patterns of inter-city travel networks. NEV and FV networks exhibited a flower-shaped topological structure, where core cities constituted the “flower heart” and peripheral cities form “petals” via short-distance, high-frequency bidirectional connections. NEV dominant flows connect three major Pearl River Delta cities. This spatial structure differs from the conventional Guangzhou-Shenzhen dual-core pattern, instead forming a distinct Guangzhou-Shenzhen-Zhuhai tri-core structure. Furthermore, Cities with airports and high-speed rail stations constituted primary hotspots for NEV adoption and potential transition zones for FV replacement. (3) Identification of key influencing factors. Charging infrastructure deployment in service areas did not effectively boost NEV inter-city travel volumes. Instead, this growth was driven primarily by labor force expansion in the transportation sector, development of ride-hailing services, and reductions in overall travel costs. For inter-city FV travel, the resident population emerged as the most influential factor, reflecting the travel demand diversification extending beyond service sector employees to the general resident population.



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1159 - The Role Of Commute Mobility In Activity Space Segregation Evidence From Mobile Phone Data

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This study explores the impact of commute mobility on activity-space segregation across income groups using mobile phone data from Guangzhou, China. We calculate the exposure index for different income groups based on residential and work locations and apply an interpretable machine learning method to analyze the relationship between segregation and urban land use. Our study provides a nuanced understanding of how commuting patterns influence social segregation in urban settings. We find that the exposure of low-income individuals to moderate-income groups and moderate-income individuals to high-income groups increases after commuting, while the reverse exposure decreases. This suggests that commuting acts as a catalyst for social interaction between different income groups, particularly benefiting lower-income individuals in their encounters with higher socioeconomic statuses. The city center emerges as a critical space for social interaction, yet it also poses a risk of social isolation for those unable to access it. Our analysis of land prices and POIs reveals that industrial and office land prices, along with work-related POIs, increase exposure indices, while commercial facilities have a contrasting effect on workplace segregation. Furthermore, we observe that short commuting distances have a dual effect on segregation, while long commuting distances foster social integration, especially for low and moderate-income individuals who typically live further from city centers due to housing affordability. These findings underscore the complex interplay between commuting, urban spatial structure, and social integration, offering valuable insights for urban planners and policymakers aiming to create more inclusive and integrated urban environments.



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1176 - Attributing Personal Transport Carbon Footprints

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Understanding environmental justice in transport-related carbon emissions has been constrained by the absence of nationwide data that jointly capture mobility behaviour, travel purpose, distance, mode, and traveller socioeconomic status. Existing work typically relies either on aggregate origin–destination summaries that conceal behavioural heterogeneity, or on digital trace data that, while rich, are often weakly representative and difficult to align with known population totals. These limitations hinder robust attribution of carbon burdens to specific persons. We therefore propose a macro-constrained probabilistic reconstruction framework that makes national mobility behaviour observable under multiple structural constraints. The approach integrates individual SafeGraph mobility traces, building-level CoreLogic property characteristics and values, SafeGraph Places activity functions, tract-level ACS mobility statistics, and nationwide origin–destination totals disaggregated by transport mode and distance. Instead of deterministic iterative proportional fitting, we reconstruct a high-dimensional joint distribution of trips that is probabilistically consistent with macro-scale travel volumes while preserving micro-scale behavioural and socioeconomic structure. The resulting dataset enables, for the first time, nationwide observation on personal attribution of transport-related carbon emissions. Using this framework, we are able to find environmental injustice embedded in everyday mobility: total emissions are highly concentrated in a small subset of high-income, long-distance, and non-essential travel behaviours, while lower-income populations contribute disproportionately little despite relying primarily on necessity-based mobility. This decoupling between basic mobility needs and carbon emissions is spatially and behaviourally consistent across the United States. These results imply that uniform transport-based climate policies may misallocate mitigation responsibility and risk exacerbating inequities. More broadly, the proposed framework offers a scalable pathway for linking digital mobility traces to equity-focused carbon accounting worldwide.



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1190 - Revealing Spatial Inequalities In 15 Minute Park Accessibility Through Integration Of 3d Pedestrian Networks And Crowd Sourced Quality Metrics

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Background

Equitable access to urban parks is a cornerstone of the 15-minute city concept, promoting health and sustainability. However, conventional accessibility models, relying on 2D networks, may systematically misrepresent true pedestrian effort in topographically complex cities, potentially obscuring spatial inequalities for vulnerable populations. This study hypothesizes that integrating a fine-grained 3D pedestrian network and subjective park quality perceptions will reveal significant, previously underestimated inequalities in 15-minute park accessibility among public housing residents in high-density cities like Hong Kong.

Materials and Methods

We developed a novel accessibility measure for Hong Kong's public housing estates using an enhanced three-step floating catchment area (E3SFCA) method. Walking travel times were calculated using a detailed 3D pedestrian network, incorporating topography and grade-separated infrastructure, with speeds adjusted via Tobler's hiking function. Park attractiveness was quantified using weighted average ratings from Google Maps reviews. The resulting 15-minute walking accessibility scores were compared against a conventional 2D model baseline. Spatial inequalities were analyzed using Gini coefficients, Getis-Ord Gi* hotspot analysis, and bivariate Local Indicators of Spatial Association (BiLISA).

Results

The 3D model revealed substantial spatial inequalities masked by the 2D approach. Intra-urban inequality, measured by the Gini coefficient, was 20.8% higher in the 3D model (0.4867) compared to the 2D model (0.4028). The 2D model significantly overestimated accessibility in hilly districts (e.g., median score in Wan Chai was 0.6128 units lower in 3D) while underestimating it in areas with grade-separated pedestrian infrastructure. Hotspot and BiLISA analyses identified pronounced disadvantages for estates in topographically challenging districts like Southern and Kwun Tong, where over 77% of estates fell below the citywide median accessibility.

Conclusions

Achieving spatial justice in chrono-urbanism frameworks requires explicitly confronting vertical segregation. This study demonstrates that leveraging multi-source spatial big data, i.e., 3D pedestrian networks and crowd-sourced quality metrics, provides a more accurate, nuanced assessment of park accessibility, critical for identifying and addressing inequalities faced by vulnerable populations. The findings underscore the necessity of incorporating 3D urban terrain into sustainable urban planning and mobility analyses to advance health and equity goals in future cities.



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1287 - A Space Place Tesseract Model For Spatial Big Data And Geoai

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Background/Hypothesis:

While spatial big data and GeoAI effectively uncover patterns, these insights are fundamentally driven by human behavior. How individuals perceive urban systems (e.g., economic, social, cultural, and transport systems) directly shapes mobility and its impact on public health and sustainability. This paper argues that human interaction with the world transcends physical location, involving diverse concepts of space and place. Furthermore, in our increasingly hybrid physical-virtual world, human needs are met through a blend of physical mobility and digital activity. Consequently, spatial big data and GeoAI research must integrate these multi-dimensional space-place concepts to accurately reflect our modern, hybrid world.

Materials/Methods:

This study utilizes a multidimensional space-place framework encompassing absolute space (location), relative space (locale), relational space (identity), and mental space (sense of place). This framework informs the development of a “space-place tesseract” model, designed to capture the complexity of a hybrid physical-virtual world. To demonstrate the model’s utility, it was applied to a Yelp Open Dataset using GPT-4o to organize and extract nuanced insights across these diverse space-place dimensions.

Results:

The space-place tesseract model effectively captures how urban Points of Interest (POIs) are perceived across absolute, relative, relational, and mental dimensions. Our findings highlight that the interrelations between these space-place concepts could significantly influence mobility and behavioral patterns. By leveraging GPT-4o, we generated space-place informed insights that provide critical complementary information to traditional, location-centric GeoAI and big data studies.

Conclusions:

Traditional spatial big data and GeoAI research often prioritizes physical location, an approach that is increasingly insufficient for understanding human interaction in a hybrid physical-virtual world. This study demonstrates that the space-place tesseract model, combined with LLMs like GPT-4o, provides a more holistic framework for analyzing urban dynamics. By integrating multidimensional space-place concepts, this approach offers deeper insights for designing transport systems that better support urban health and sustainability.



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1731 - Who Walks The Streets Unraveling The Urban Rural Paradox And The Role Of Empowerment Through Women's Street Visibility In India

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Gender equality is a fundamental indicator of social development, yet the determinants of women's visibility in public spaces remain poorly understood, particularly in contexts like India with deep-seated gender norms. Although urbanization is often argued to promote greater gender equity in public life, it remains unclear whether public spaces in urbanized areas actually support higher street-level participation by women compared to rural settings. Using a novel dataset of Google Street View images combined with socioeconomic indicators, this study assesses the gender composition of pedestrians on streets across India. Our findings reveal an urban-rural paradox: while the absolute number of female pedestrians is greater in urban areas, the proportion of women is significantly lower than in rural areas. This suggests that urban environments do not necessarily translate into more gender-equitable public spaces. Further analysis demonstrates that indicators of women's empowerment, such as participation in household decision-making and opposition to domestic violence, are strongly associated with greater street visibility, especially in rural and economically disadvantaged regions. Economic factors, including women's employment and household poverty rates, exhibit nonlinear associations with visibility. These results underscore that urbanization alone is insufficient for advancing gender equality in public spaces. Instead, context-specific interventions that address both structural economic barriers and deep-rooted sociocultural norms are critical for enhancing women's visibility and empowerment amid rapidly urbanizing landscapes.



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2660 - A Network Based Approach To Understand The Risk Of Mobility Related Social Exclusion In Spatiotemporal Activities

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This study proposes a novel network-based approach to understand the risk of Mobility-related social exclusion (MRSE) in people's daily activities. Compared to existing approaches focusing on physical mobility and individual travel network, this study develops an integrated analysis method that considers both population-level mobility network and spatiotemporal dynamics of individual activity patterns. This method considers strong connections, frequent interactions, and key structural roles within a population-level mobility network to be able to better facilitate spatial and social interactions. Further, individuals who are regularly exposed to these locations during their daily activities are considered to be more likely to engage in various activities, access services, and participate in social interactions. With a 7-day bus travel dataset of older adults in Beijing China, this study investigates the risk of MRSE of older adults as a case study, using both the proposed network-based and traditional activity space-based measures. The results obtained using the proposed network-based approach offers insights into the potential spatiotemporal behavior and dynamics for interactions. This study also highlights the importance of evaluating not only physical mobility but also the connectivity, interactions and between different locations and key structural roles within a travel network when investigating the risk of MRSE during daily activities.



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3194 - Investigating Mountainous Environmental Effects On Elderly Walking A Spatially Heterogeneous And Non Linear Modelling Approach

Lixun Liu¹, Longhui Yuan¹, Yuxuan Lan², Jiawei Cheng³, Jiangjun Wan⁴, David A. Clifton⁵, Yujiang Wang⁵

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Mountainous cities present unique pedestrian challenges, yet research often overlooks the synergistic effects of steep topography and built environment on vulnerable populations like the elderly. Existing studies predominantly focus on plain cities, inadequately integrating topography into analysis and largely ignoring micro-perceptual factors and their non-linear relationships with walking behavior. Mobility equity implications for older adults navigating slopes remain insufficiently examined.

This research addresses these gaps by investigating environmental determinants influencing walking distances among elderly residents in mountainous urban areas, with explicit attention to transport equity. Utilizing official 2015 Chongqing Urban Residential Travel Survey data, we employ a multi-method framework: slope-adjusted accessibility calculations incorporating reduced walking speed on inclines; Multiscale Geographical Weighted Regression to capture spatial heterogeneity and machine learning to detect non-linear relationships.

Results demonstrate that topography-integrated models substantially outperform conventional approaches. Slope acts as a potent spatial barrier. Environmental impacts on elderly walking distance are highly spatially variable and contingent on local topography. Variables exhibiting distance-saving effects show the greatest impact in areas deficient in those resources. Both macro- and micro-scale elements influence walking distance through non-linear relationships with identifiable thresholds, varying meaningfully by trip purpose: discretionary walking distance is more sensitive to street-level liveliness, while obligatory trips respond more to perceptual comfort.

This study concludes that effective age-friendly interventions in mountainous cities require context-sensitive methodologies incorporating terrain-adjusted accessibility measures and threshold-based design guidance. It provides a nuanced methodological framework and empirical evidence to optimize facility layouts for walking across diverse trip purposes, advancing equitable planning in terrain-defined urban settings.



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C24.44-Transport Geography => Modelling Mobility Behaviours: Diverse Methods, Shared Challenges, New Insights



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1195 - Research On The Impact Of The Built Environment On Passenger Flow Distribution In The Overlapping Area Of Adjacent Rail Transit Stations

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In the process of promoting station-city integration, a large number of high-density construction around a single station has resulted in the population density within the station area being greater than the passenger flow carrying density of the station. The problem of rail transit passenger flow oversaturation caused by the rapid increase in passenger flow is gradually intensifying. With the continuous integration and development of transportation facilities and cities, single-core high-density construction centered on stations will continue to spread outwards, forming a “point-axis” development trend. The passenger flow attraction ranges of adjacent stations will overlap, and Become one of the main sources of customer flow. In the overlapping domain of adjacent stations, the distance between passengers and several surrounding stations is similar. In this case, distance is no longer the main factor affecting passengers’ choice of station.

This study proposes the concept of overlapping domains of adjacent stations, aiming to change the built environment through urban design, thereby balancing the passenger flow differences between adjacent stations. OLS regression is used to fit the passenger flow contribution coefficients of the overlapping domains, combined with random forests. The XGboost regression is used to establish the influence model of passenger flow distribution in the overlay domain of adjacent rail transit stations, and analyze the influence of various built environment factors on passenger flow distribution. Taking Xiamen City as an example, the results show that the degree of land use mixing is the main factor affecting the distribution of passenger flow. The coordinated development of multi-station unified planning is more conducive to balancing passenger flow, and the multi-system connection system and richer station-city connections are more helpful. The functional aggregation of facilities and multi-station overlay domains can more effectively control the passenger flow distribution of adjacent stations.



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1296 - Bayesian Poisson Modeling Of Built Environment Effects On Pedestrian Crash Risk Among Older Adults In Mountainous Urban Areas

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In the context of China's accelerating population aging, ensuring pedestrian safety for older adults has emerged as a critical public health and urban governance priority. This challenge is particularly pronounced in mountainous cities, where the complex interplay between the unique built environment—characterized by steep gradients, constrained land use, and intricate three-dimensional road networks—and pedestrian mobility remains significantly understudied. To address this knowledge gap, this study systematically investigates the specific associations between multidimensional built environment factors and the frequency of road traffic crashes involving older pedestrians in such challenging terrains. The research aims to move beyond general observations and propose targeted, evidence-based safety optimization strategies tailored to the topographical and morphological realities of mountainous urban settings. Utilizing a comprehensive ten-year dataset of road traffic crashes from Yuzhong District, Chongqing—a quintessential high-density mountainous city—this study employs a robust methodological framework. We conducted a comparative analysis using both Standard Poisson Regression and Bayesian Poisson Regression models. This dual-model approach not only identifies significant associations but also enhances the reliability and interpretability of the findings by accounting for data uncertainty and providing posterior distributions of the estimated effects. The key findings reveal nuanced and sometimes counterintuitive relationships. Crash frequency showed a significant positive association with higher densities of footbridges and recreational facilities, as well as with a greater proportion of parks and green space. This suggests that certain amenities, while beneficial for livability, may concentrate pedestrian activity or create complex crossing scenarios that increase risk for older adults. Conversely, crash frequency decreased notably with a higher degree of land use mix, greater densities of educational facilities, and a higher density of public transport stops. These factors likely promote shorter, more localized trips and reduce vehicular speeds. Notably, the proportion of storage/industrial land and the density of medical facilities showed no statistically significant effects on crash frequency in this context. The findings provide actionable insights for enhancing pedestrian safety in mountainous urban areas.



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1352 - Modeling Determinants Of Link Level Shared Bike Volumes With Spatial Interdependence And Heterogeneity

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Background.

This study examines how accounting for spatial interdependence and spatial heterogeneity reshapes the estimated determinants of link-level shared bicycle volumes in Taipei, Taiwan. While previous direct-demand studies have increasingly acknowledged spatial effects, little is known about how ignoring spatial interdependence may distort inferred relationships or how such relationships vary across space.

Materials and methods.

To address this gap, we sequentially apply negative binomial, spatial negative binomial, and geographically weighted negative binomial models to explicitly capture count-data characteristics, spatial dependence, and spatially varying effects. Influencing factors are classified into macro features, including socioeconomic characteristics, land use, and transport system attributes within a 500-meter buffer around each road link, and micro features, which capture link-specific attributes such as functional classification, on-street parking, bicycle facilities, and roadway width.

Results.

The results show that the effects of micro features are highly stable across time and space and remain largely unchanged after accounting for spatial interdependence. In contrast, the effects of macro features exhibit pronounced spatiotemporal heterogeneity and vary substantially once spatial interdependence is explicitly modeled.

Conclusions.

These findings suggest that macro-scale built-environment influences on travel demand are subject to both spatial fallacy, arising from unmodeled spatial interdependence, and spatial contextual effects, reflecting genuinely different relationships shaped by localized development contexts. By disentangling these two effects, this study provides a more accurate understanding of how the built environment shapes shared bicycle volumes and offers important insights for developing context-sensitive, bicycle-friendly planning strategies.



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1510 - Decoding Walking Behavior A Review Of Environmental And Individual Influences On Pedestrian Route Choice

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Pedestrian route choice, a crucial component of walking behavior, provides important insights for developing walkable, equitable, and sustainable cities. Despite its significance, research in this area remains fragmented across various fields, and the importance of route-level information is not widely acknowledged for sustainable urban planning. This review synthesizes existing studies on pedestrian route choice by categorizing influencing factors into three main domains: built environment, natural environment, and individual factors. We find that most studies highlight the impact of the built environment on pedestrian route choice, focusing on elements such as design, density, and diversity. The natural environment influences pedestrian route choice through aspects like green-blue spaces, topography, weather, and microclimates, as well as air and noise pollution. Individual factors, including demographics, socioeconomic status, and trip purposes, further shape the choices available to pedestrians. We propose three future research directions on pedestrian route choice to tackle critical environmental challenges: (1) Investigating the effects of volumetric urban development on pedestrian route choice through three-dimensional networks and microclimates; (2) Examining how space-time constraints and perceived safety influence pedestrian route choice of different social groups; (3) Evaluating how pedestrians proactively respond to environmental exposures through route choices in the digital age. Research in these directions will provide further insights into the nexus between pedestrian environments and behavior in complex urban contexts, expand the dimension and measurement of accessibility and walkability, and contribute to environmental exposure management by incorporating behavioral interventions.



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1522 - Examining Dual Exposure To Traffic Congestion And In Vehicle Crowding Among Older And Younger Adults Using Smart Card Data

Jiaomin Wei¹, Zihan Kan², Mei-po Kwan²

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In urban travel, traffic congestion often results in prolonged travel times, while in-vehicle crowding causes physical discomfort. Bus passengers uniquely face dual exposure to both congestion (from shared road networks) and crowding (from shared vehicle space), which compounds health risks and undermines sustainable transport goals. Despite this, few studies examine these concurrent exposures or the socio-demographic disparities in who bears this burden, particularly critical for vulnerable populations like older adults who may face disproportionate impacts. Using Beijing bus smart card data, we measure congestion and crowding levels to identify adverse travel patterns and infer passengers' home locations. We then apply statistical and random forest models to examine how socio-demographic characteristics shape exposure to these adverse conditions across different urban areas. The study reveals the spatial-temporal dynamics of congestion and crowding, the daily rhythms of adverse travel flow across urban spaces, and the socio-demographic characteristic disparities that shape differential exposures among older and younger adults. The findings indicate that congestion concentrates in urban centers and suburban hubs during peak hours, while crowding tends to persist throughout the day on suburban-urban corridors. Urban residents experience more congestion but less crowding than suburban and rural residents, while older adults experience shorter durations but higher rates of adverse conditions than younger adults. By revealing dual exposure patterns across space, time, and demographics, this study identifies where and when interventions are needed to reduce congestion for urban commuters and crowding for suburban riders, supporting more equitable transportation planning.



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1666 - Can Daily Mobility Be Modelled As The Aggregation Of Individual Behaviours

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Background and hypothesis

Daily mobility is frequently described through aggregated indicators that summarise movements at territorial scales. While such representations are useful for identifying broad patterns, they provide limited insight into the processes through which daily mobility emerges. An alternative consists in modelling mobility by decomposing it into individual behaviours and reconstructing collective patterns through aggregation. This presentation examines whether daily mobility can reasonably be modelled as the aggregation of individual behaviour models.

Materials and methods

The presentation adopts a pragmatic theoretical position grounded in individual-level, probabilistic and spatiotemporal modelling frameworks. Individual behaviour models are conceptualised as formal representations of constraints, regularities and conditional relationships shaping daily mobility, rather than as accounts of individual decision-making processes. The approach relies on the reconstruction and aggregation of individual trajectories to approximate collective mobility patterns.

Results

This perspective highlights that aggregating individual trajectories does not aim to reproduce social interaction mechanisms, learning processes or adaptive behaviours. Instead, it allows the identification of internally coherent mobility configurations emerging from structured individual constraints. The analysis also shows that modelling outcomes remain sensitive to modelling choices and data availability, a limitation shared with more aggregated approaches.

Conclusions

Treating daily mobility as the aggregation of individual behaviours constitutes a methodological compromise rather than a theoretical ideal. However, this compromise offers transparency in behavioural assumptions and enables comparison across territorial contexts. The contribution clarifies the scope and status of behaviour-based models, arguing that their relevance lies in their capacity to reconstruct plausible and coherent representations of daily mobility.



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1940 - Spatial Heterogeneity In Willingness To Pay For Drone Delivery

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The proliferation of e-commerce has intensified the demand for efficient last-mile delivery, making drone delivery a promising, albeit complex, solution for dense urban environments. While the technical capabilities of drones are advancing rapidly, consumers' Willingness To Pay (WTP) for these services, and the specific attributes they value, vary significantly across different geographical contexts. Existing research often overlooks how specific urban spatial attributes influence individual WTP and shape the overall market for drone delivery.

This paper investigates the spatial heterogeneity in consumers' WTP for distinct drone delivery service attributes within Seoul, South Korea, a city characterized by its unique and diverse urban fabric. Utilizing data from a comprehensive Stated Preference (SP) survey administered to Seoul residents, we employ a Latent Class Choice Model (LCCM) to identify distinct consumer segments characterized by diverse WTP profiles for drone delivery attributes. Crucially, the class membership function in our LCCM is formulated by a rich set of spatial attributes derived from respondents' residential locations, including housing type, building density, urban land use mix, and proximity to green spaces or key infrastructure.

Our analysis aims to reveal how these fine-grained spatial characteristics predict an individual's likelihood of belonging to specific WTP classes, thereby uncovering the "who" and "where" of drone delivery market potential in Seoul. Our results reveal at least three distinct segments: a 'Convenience-Driven High-Rise' class, demonstrating a high WTP for rapid delivery and tolerance for operational noise, prevalent in high-density apartment complexes; a 'Privacy-Sensitive Traditional' class, exhibiting a strong WTP for noise mitigation and visual privacy, particularly in low-rise residential areas; and a 'Cost-Conscious Value Seeker' class, driven primarily by low service fees, often located in mixed-use zones. These findings offer invaluable insights for urban planners, geographers, logistics providers, and policymakers seeking to strategically develop drone delivery infrastructure.



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2017 - Impacts Of Shanghai Suburban Railway Airport Link Line On Daily Mobility And Urban Accessibility

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In the context of metropolitan area expansion and increasing demand for long-distance daily travel, conventional metro systems are becoming less capable of meeting greater mobility needs between central city and suburban districts. Enhancing accessibility on the metropolitan scale therefore requires a multi-tier rail transit system, in which suburban railway plays a critical role. Shanghai Suburban Railway Airport Link Line with higher speed was originally designed to serve airport travel. However, its role in residents' daily commuting remains insufficiently examined.

This study takes the Airport Link Line as a case study, focusing on its daily passenger volume patterns. Based on multi-period smart card data, representative time periods—including the early opening stage, two months and six months after operation—are selected to examine overall daily patronage, temporal and spatial patterns, typical travel chains, and changes in urban accessibility. In addition, perceived factors influencing residents' use of the line are identified from survey evidence to complement the behavioral analysis.

The results show that daily patronage demand on the Airport Link Line has increased steadily since its opening, indicating its growing integration into everyday mobility. Temporally, clear commuting tidal patterns emerge on weekdays, while leisure-oriented and more flexible travel dominates on holidays, with notable station-level differentiation related to surrounding land-use structures and transfer conditions. Spatially, the line effectively connects major residential areas in western suburbs with employment clusters in Pudong, such as Zhangjiang and Kangqiao located in the east, demonstrating a significant efficiency advantage for long-distance, cross-district commuting. Accessibility along Metro Lines 9 and 15 has been significantly enhanced through interchange connections with the Airport Link Line, contributing to a broader expansion of high-accessibility residential zones from the city center toward the periphery. Travel time savings and high operating speed are the main factors encouraging the Line's daily use, whereas insufficient last-mile connectivity, relatively high fares, and weak station-area facilities constrain its demand.

Overall, the Airport Link Line is evolving into a key rapid corridor supporting long-distance daily travel within Shanghai's multi-level rail transit system. This study provides empirical evidence to inform suburban rail optimization and urban accessibility enhancement in metropolitan regions.



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2050 - Classifying Heterogeneous Commuting Experiences Via Integrated Wearable Sensing And Ecological Momentary Assessment

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Background/Hypothesis:

Traditional transport research often views commuting as a source of disutility, primarily focusing on travel time and physical efficiency. However, these metrics frequently overlook the internal experiential heterogeneity of commuters. This study hypothesizes that commuting experiences are multi-dimensional and cannot be captured by subjective surveys alone. By shifting the focus from “travel cost” to “travel experience,” this research seeks to decode the psychophysiological states of commuters. It aims to challenge the conventional stress paradigm in transport geography by identifying nuanced states such as “eustress” and “hidden depletion,” thereby providing a more granular understanding of mobility behavior.

Materials and Methods:

Using a multi-modal Geographical Ecological Momentary Assessment (GEMA) framework, the study collected time-stamped physiological data and real-time psychological reports from 203 participants in Beijing. To classify these heterogeneous experiences, Latent Profile Analysis (LPA) was employed. This methodological approach integrates objective sensing with subjective appraisals to model the complex coupling mechanisms inherent in urban transit.

Results:

The analysis identified four distinct commuting experience profiles: Vitality (High Arousal/Positive Valence, 18.9%), Serenity (Low Arousal/Positive Valence, 23.1%), Distress (High Arousal/Negative Valence, 30.0%), and Boredom (Low Arousal/Negative Valence, 28.4%). A key finding is the discovery of “Vitality” as a form of beneficial eustress and “Boredom” as a state of hidden physiological depletion. These results demonstrate that physiological responses during travel do not always align linearly with reported satisfaction.

Conclusions:

This study advances transport geography by providing a robust bio-psychological typology for commuting experiences. This research lays the groundwork for future “experience-oriented” transport planning, advocating for the design of mobile environments that mitigate distress and enhance the overall quality of urban mobility.



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2147 - When Satisfaction No Longer Drives Demand Rethinking Rail Mobility In The Post Pandemic Era

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Despite noticeable improvements in rail service quality and passenger satisfaction in the post-pandemic period, rail demand in Great Britain has not returned to pre-Covid-19 levels. This study examines whether the long-assumed positive relationship between passenger satisfaction and travel demand remains valid in the current climate of profound social and behavioral transformations.

The research combines newly available Rail Customer Experience Survey (RCXS) data with station-based passenger demand statistics and post-pandemic labor market indicators to analyze how the satisfaction-demand relationship differs according to passenger segments and travel purposes. It particularly focuses on the assumption that hybrid work arrangements and socioeconomic disparities are reshaping daily mobility practices and weakening the central role of regular commuting.

Methodologically, the study combines descriptive and segment-based analyses with an interaction-based regression model to reveal how the relationship between passenger satisfaction and rail demand changes according to travel purpose, socioeconomic group, and post-pandemic work arrangement. Instead of assuming a homogeneous behavioral response to improvements in service quality, this study tests whether the impact of satisfaction on demand differs across commuting, business travel, and discretionary travel segments.

Focusing on the interaction between passenger perceptions, behavioral adaptation, and societal transformation, this study contributes to the debate on whether contemporary mobility systems are undergoing a genuine transformation or a delayed adaptation process. It also questions the validity of traditional satisfaction-based demand recovery models in a context where daily life, work patterns, and mobility needs have fundamentally changed.

The study directly contributes to current policy discussions on the recovery of the railway sector, highlighting the need to develop demand and performance strategies that are more aligned with changing daily mobility patterns, rather than approaches based solely on improving perceived service quality.



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2185 - Cities As Mobility Systems Network Analysis In A Global South Metropolis

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Background

Building on the body of work on urban systems and on the importance of mobility in reshaping the production of space, this contribution proposes an analysis of the Delhi metropolitan area (India) through the structure of flows. The starting point of this work lies in the considerable difficulty of capturing Delhi's urban dynamics using conventional approaches, given the city's spectacular urban growth and the relative scarcity of mobility data. This study also aims to define a coherent framework to delineate spatially the urban area and the multiple territories it integrates through functional linkages—most notably daily commuting patterns—, which could prove useful as a basis for the development of urban policies.

Materials and methods

We make use of a large movement dataset derived from the digital traces of Facebook mobile application users. This novel data source is combined with more traditional data for a better appraisal of the social dimension behind the commuting flows. We then model the urban area as a network to compute various metrics, including community detection, to infer the structuring infra-urban patterns.

Results

Our result allow an understanding of the city that goes beyond the motionless picture of its residential characteristics. Among the main insights unveiled by the mobility-based approach: the mapping of a poly-centric structure that expands; shifting centrality hubs between daytime and nighttime, largely located on the periphery of the core city rather than in its center; and the persistence of social-spatial segregation structures.

Conclusions

Urban and mobility models can largely benefit from such novel datasets, especially in the context of large metropolises in the Global South. However, due to significant informational blindspots, these datasets mustn't be considered without a critical framework, nor without being patched with « traditional » data sources on the socio-economic characteristics of the population, and robust context-specific knowledge on the area.



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2194 - Evaluation Of The Choice Of Transport Modes With The Free Fare On Public Transport System In São Caetano Do Sul Brazil

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Policies offering partial or total free public transport have been growing worldwide. In Brazil, there are already more than 140 cities with universal free transport, i.e., for everyone during bus operating hours, covering a population of over 6 million people. This study seeks to estimate the effects of implementing free public transport on buses in São Caetano do Sul, in the metropolitan region of São Paulo, Brazil, in relation to changes in mode of transport. The city has no rural areas and, although it is not large compared to its neighbour São Paulo, it is densely populated and can provide an indication of the effects of this measure in similar environments. The policy was implemented in São Caetano do Sul in November 2023, and its effects were estimated using a discrete choice model in a Multinomial Logit and Nested Logit approach, considering data from August 2023 to May 2024, using the 2023 Origin-Destination Survey database. Results indicate that the number of people who commute daily by car, motorcycle, and taxi-like apps has declined. On the other hand, those who use public transport (both using and not using São Caetano do Sul municipal buses) and walk have increased, which differs from other studies that indicate a reduction in walking. These results suggest that such a policy has the effect of reducing the use of private motor vehicles, which may be the goal of potential public policy makers.



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2640 - Determinants Of Mobility Choices In French Region (lorraine) Socio Demographic Trajectories Employment And Spatial Inequalities

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Background :

The focus of this study is the Lorraine region in France, a territory marked by a growing number of cross-border commuters and worsening congestion on its transportation networks—both road and rail. Existing literature underscores the intricate connections between socio-demographic characteristics, life courses, and lifestyle behaviors, providing a foundation for this analysis.

This research seeks to examine the interplay between individuals' life trajectories, employment patterns, and mobility choices, with a particular emphasis on the spatial and territorial dimensions that shape these dynamics.

Methods :

This study adopts a comprehensive analytical framework to unpack the determinants of mobility patterns, integrating both quantitative and qualitative approaches. Drawing on data from the French population census, we employ multivariate regression models to elucidate the factors driving automobile use. The explanatory variables encompass a range of socio-demographic attributes—including educational attainment, marital status, generation (e.g., Baby Boomers, X, Y), employment—as well as spatial characteristics such as residential context and migratory movements recorded in the year preceding the census.

Field interviews reveal the motivations behind mobility and residential choices, enriching quantitative data. At its core, this research seeks to inform public policy by dissecting the socio-territorial influences that shape individuals' lifestyles and mobility choices. By comparing data from 2012 and 2022, we aim to trace the evolution of these dynamics over the past decade, offering a nuanced perspective on how societal and spatial transformations intersect with everyday mobility practices.

Results:

Our analysis reveals several key trends in mobility and employment patterns. Firstly, there has been a notable rise in unemployment, particularly among young people, alongside an increase in cross-border employment. Additionally, the labor market has experienced a process of masculinization, with a concurrent growth in automobile use, especially in low-density areas.

Conversely, we observe a decline in automobile dependency among younger generations, who are increasingly choosing to reside in urban centers. This shift reflects evolving priorities, as younger individuals demonstrate a stronger preference for convenience and express heightened environmental concerns.

Conclusion:

Daily mobility behaviors are dynamic and shaped by a complex interplay of social and geographical origins, as well as individual life trajectories.



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2654 - Ride Hailing Alleviates Transport Poverty But Not For All

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Transport poverty limits access to essential opportunities and reinforces social inequality. App-based ride-hailing offers flexible door-to-door mobility and could potentially alleviate such inequality. Using nationally representative survey data from 7,212 urban residents across 81 Chinese cities, this study examines how two key dimensions of transport poverty (i.e., mobility poverty and accessibility poverty) are associated with ride-hailing use. Regarding mobility poverty, we find that individuals without a driver's license use pooled ride-hailing more frequently, but not private ride-hailing. Contrary to expectations, car ownership is positively linked to higher ride-hailing use, suggesting that these services often complement rather than substitute private vehicle access and may reinforce existing mobility inequalities. Importantly, people who have a car but cannot drive face a hidden form of mobility poverty and use ride-hailing the most. For them, ride-hailing offers a vital new way to overcome this barrier. Regarding accessibility poverty, living far from essential opportunities (i.e., proximity-based poverty) is strongly associated with greater ride-hailing use, whereas poor quality of nearby opportunities (i.e., quality-based poverty) shows no significant association. Crucially, people who face both proximity-based and quality-based poverty (i.e., the most severe form of accessibility poverty) are the most frequent users. This suggests that ride-hailing plays a critical role for the most disadvantaged, who rely on it to overcome compounded spatial and service-related barriers. The study advances theory by demonstrating that transport poverty must be understood as multidimensional, with significant interactions shaping ride-hailing behavior. We conclude by discussing the equity-oriented policy implications of these findings.



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3231 - Rethinking Perceived Accessibility How Economic And Temporal Constraints Moderate The Path To Life Satisfaction

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Perceived accessibility—the perceived ability to reach life’s necessities and desires—is a key link between transport provisions and subjective well-being. Yet critical gaps remain in understanding how this perception is formed, particularly how it is reshaped by economic and temporal constraints, and how it ultimately translates into life satisfaction. Drawing on the capability approach, this study develops an integrated framework to examine how perceived travel abilities and travel mode availability influence life satisfaction, with perceived accessibility as a mediator, and how economic and temporal constraints moderate these pathways. Using data from a survey of 1,002 individuals in Changsha, China, we tested the model via structural equation modelling. Results confirm that perceived accessibility mediates the relationship between perceived travel abilities, travel mode availability and life satisfaction. Moderation analysis reveals that constraints systematically reconfigure these relationships: economic constraints weaken the positive effect of travel mode availability on perceived accessibility but strengthen the positive link between accessibility and life satisfaction. Both economic and temporal constraints attenuate the negative effect of limited perceived travel abilities on perceived accessibility. These findings demonstrate that financial and time pressures are not merely background factors but actively reshape how individuals convert transport opportunities into well-being. The study offers a nuanced, empirically validated model that advances the Capability approach and provides critical insights for policymakers aiming to enhance transport-related well-being, particularly for constrained populations.



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C24.44-Transport Geography => Resilience and Adaptability of Transport and Mobility Systems in the Face of External Shocks



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1333 - Unraveling The Nonlinearities Between Built Environment And Commuting Resilience A Case Study In Beijing

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Background: Urban transport planning has long focused on commuting efficiency. In megacities such as Beijing, persistent congestion is increasingly driven by recurrent peak-hour instability. This study defines commuting resilience as a local system's capacity to absorb routine peak-hour stress while maintaining temporal stability and balanced daily mobility. We operationalize commuting resilience using a 1 km grid-level Commuting Resilience Index (CRI) and examine the spatially heterogeneous and nonlinear relationships between built environment characteristics and CRI in Beijing.

Materials and methods: We use anonymized mobile phone signaling data in July 2024 to infer home-work commuting flows at a 1 km × 1 km grid scale. CRI integrates commuting flow resilience (temporal smoothness of peak-hour commuting flows) and commuting burden resilience (the degree to which total daily traffic is dominated by commuting trips). Built environment variables include POIs density, residential and employment population density, transit supply, land-use mix (Shannon entropy), housing prices, and nighttime light intensity. A Geographically Neural Network Weighted Regression model captures spatially varying and nonlinear associations.

Results: CRI shows pronounced spatial heterogeneity. Employment intensity is positively associated with CRI, whereas residential population concentration is negatively associated with CRI. Mono-functional residential areas therefore exhibit lower resilience and more synchronized peak-hour demand. Housing prices and nighttime light intensity are negatively associated with CRI, indicating stronger peak-hour pressure and lower adaptability in saturated core districts. In contrast, higher bus service density and greater land-use mix are positively associated with CRI.

Conclusions: The findings demonstrate that residential population concentration and facility intensification alone do not ensure high levels of commuting resilience. Residential densification without sufficient local jobs or transit support reduces resilience, while excessive concentration of high-intensity activities amplifies peak-hour instability. Planning should shift from generalized densification to targeted functional balancing by improving jobs-housing balance, strengthening public transit, and promoting mixed land use to enhance commuting resilience and alleviate congestion



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1334 - Synergistic Effects Of Extreme Heat And Air Pollution On Urban Mobility Nationwide Evidence From China

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Background/hypothesis: A growing body of research has documented the negative effects of high temperatures and air pollution on urban mobility. This study extends this literature by examining whether concurrent extremes of heat and air pollution interact to produce a joint effect that is greater than the sum of their individual effects.

Materials and methods: To this end, we combine mobile phone-derived mobility data on daily intracity trip rates with weather and air quality observations for the summer of 2023 across 296 Chinese cities. We define extreme heat using each city's 95th percentile of daily maximum temperature and extreme air pollution using the national 95th percentile of the air quality index. We then estimate the individual and interactive effects of these extremes on intracity mobility using a set of fixed-effects panel regression models.

Results: The results indicate that both extreme heat and air pollution significantly reduce intracity mobility, with the effect of heat being more pronounced. Moreover, the interaction effect is statistically significant and are larger in magnitude than that of extreme air pollution while smaller than that of extreme heat. These results are robust to alternative thresholds for defining extremes (i.e., the 90th and 97th percentiles) and consistent across geographic regions (i.e., northern versus southern cities), providing strong evidence of synergy.

Conclusions: Overall, these findings contribute to our understanding of behavioral adaptation to compound heat and air pollution extremes, which are becoming increasingly frequent in the context of climate change, and shed light on the social costs of such compound extremes through the lens of urban mobility.



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1691 - Did Covid 19 Really Change Daily Mobility In Polish Cities

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The aim of this presentation is to assess to what extent the COVID-19 pandemic has permanently altered the daily mobility patterns of residents of selected large cities in Poland. Previous studies suggest that, on the one hand, the pandemic led to a retreat from public transport (Jenelius et al. 2020), while on the other it accelerated the spread of on-line work and the use of e-services (Mueller-Langer, Gomez-Herrera 2022). To verify these hypotheses, we draw on the results of a representative survey conducted among residents of six Polish cities (Warsaw, Łódź, Poznań, Bydgoszcz, Rzeszów, Olsztyn). The questionnaire covered daily mobility before the pandemic (retrospectively for 2019) and at present. The analysis is complemented by urban traffic counts and public transport ridership data (Borowska-Stefańska et al. 2026), as well as by national road traffic measurements, reflecting broader changes in mobility in Poland.

The results indicate that long-term changes in daily mobility have been smaller than expected, particularly when compared with the projections formulated immediately after the pandemic. For example, in Warsaw the share of respondents commuting to work by car was 50.2% before the pandemic and 51% at present. Some of the observed changes can be attributed to overlapping factors, such as residential relocation. At the same time, urban traffic studies reveal a temporal spreading of peak travel periods, which may reflect increasing flexibility in the labour market.

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1939 - Space Of Regions Subjected To Flows And Transport Systems In Europe

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Background / Hypothesis

In the context of increasing globalisation, European regions are embedded in complex systems of flows of people, goods, services, knowledge and capital, in which transport systems play a key enabling role. While transport geography has extensively analysed individual transport flows, fewer studies adopt a synthetic perspective integrating multiple flow types to assess regional openness and functional integration. This contribution hypothesises that the spatial structure of transport-related flows reflects broader patterns of regional integration and differentiation within the European space.

Materials and Methods

The analysis covers 297 NUTS2 regions within the ESPON space, including the European Union and associated countries, for the period 2010–2018. A comprehensive set of eleven interregional flow matrices is constructed, covering passenger and freight transport, migration, labour mobility, tourism, trade, foreign direct investment and knowledge flows. Synthetic indicators are developed across three spatial dimensions: weighted intensity, spatial and structural concentration, and average flow distance. The methodological framework combines flow-based spatial analysis with spatial econometric modelling to examine relationships between transport-related distances, flow characteristics and regional socioeconomic attributes.

Results

The results reveal pronounced core–periphery patterns in the spatial organisation of flows, with transport-related flows exhibiting strong differentiation in both distance and concentration. Regions located closer to the European core display higher levels of openness and more diversified flow structures, while peripheral regions tend to rely on fewer and longer-distance connections. Transport-related distance plays a key role in shaping spatial integration patterns across different types of flows.

Conclusions

The study demonstrates that a multi-flow and multidimensional analytical framework provides valuable insights into the role of transport systems in shaping regional integration within Europe. By linking flows with broader socioeconomic interactions, the proposed approach contributes to a more comprehensive understanding of transport systems as an integral component of Europe's evolving space of flows.



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C24.44-Transport Geography => Revisiting the Future of Mobility: Are We Really Experiencing Social and Technological Transformation?



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1067 - Is Micromobility Transforming Urban Mobility Or Just Rearranging Inequality Full Chain Metro–micromobility Accessibility In Zhengzhou China

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Background/Hypothesis

New mobility options such as shared bikes and electric bicycles are promoted as transformative complements to urban public transport. This study investigates whether micromobility genuinely reshapes metro based accessibility, or primarily redistributes advantages and vulnerabilities across social and spatial groups.

Materials and Methods

Zhengzhou, China, is taken as a case. A full chain metro accessibility model is constructed that explicitly represents first and last mile travel, in station walking and waiting, and in vehicle time. Nine multimodal trip chains are simulated, combining walking, conventional cycling and electric bicycles at both trip ends. Housing type (commercial housing, resettlement housing, public rental housing) is used as a proxy for social differentiation. A Mode Resilience Index is introduced to quantify how sensitive neighbourhood level accessibility is to changes in first and last mile mode.

Results

Integrating micromobility substantially improves door to door accessibility and reduces time gaps between social housing and commercial housing by approximately forty to sixty percent compared with walk only chains. However, these gains are uneven. Public rental and resettlement housing areas display systematically higher values in the Mode Resilience Index, indicating greater dependence on micromobility for acceptable access. Accessibility instability is most pronounced near the urban core and at the periphery, revealing new geographies of vulnerability within an apparently improved system.

Conclusions

Micromobility enhances average metro based accessibility but also increases mode dependence and spatially uneven risks, rather than simply delivering a universal improvement. For debates on the future of mobility, the study underscores the need to evaluate new technologies not only by average performance but also by the stability and robustness of access for different social groups and neighbourhoods.



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1761 - Autonomous Public Transport In Malta Technological Transformation Or Segregation

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Background

This research examines the introduction of autonomous public transport in Malta, exploring whether such systems represent a genuine socio-technical transformation or risk generating new forms of social and spatial exclusion. The study focuses on the Maltese context, particularly the testing of an autonomous bus within the metaCCAZE project. The study hypothesises that, while autonomous public transport is frequently promoted as a solution to congestion, sustainability, and accessibility challenges, its social outcomes are highly contingent upon local socio-cultural conditions, institutional arrangements, and governance frameworks.

Methods

The study adopts a qualitative, exploratory approach, drawing on semi-structured interviews with key mobility stakeholders in Malta. Participants include public authorities and planners, public transport operators, technology providers, community representatives, and tourism-sector actors. This approach enables an in-depth examination of how autonomous public transport is imagined, negotiated, and contested across social, institutional, and technological domains, capturing perspectives that are not easily revealed through quantitative methods.

The analysis is informed by the Multi-Level Perspective (MLP) on socio-technical transitions, which conceptualises mobility systems as interactions between niche innovations, dominant socio-technical regimes, and broader landscape conditions. In this study, the autonomous bus pilot is analysed as a niche-level experiment embedded within an established transport regime shaped by existing regulatory frameworks, institutional practices, and mobility norms, and influenced by landscape-level factors such as Malta's small-island geography, ageing population, and tourism intensity.

Results

Findings reveal a tension between the anticipated benefits of autonomous public transport and concerns regarding social inclusion and spatial equity. While automation is perceived as having the potential to improve accessibility for non-drivers, stakeholders also highlight risks of exclusion, particularly for populations less able or willing to engage with platform-based and digitally mediated systems.

Conclusions

The paper concludes that autonomous public transport does not inherently produce socially transformative mobility outcomes. Without strong social embedding, participatory governance, and sensitivity to local island contexts, such systems risk reinforcing existing inequalities rather than addressing them. The findings emphasise the need for autonomous mobility initiatives in small-island settings to be designed and governed as public goods, ensuring that technological innovation aligns with social inclusion and local priorities.



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1839 - Technology Affinity A Pathway Towards New Mobility Utopia Or Yet Another Niche

Matthias Sweet¹, Darren Scott²

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Many utopian technology-based visions of the future posit that individual attitudes towards technology (notably technology affinity) will play a key role in early adoption of new transportation technologies and services and will pave the way for radical change in the mobility market. The implications of these expectations are that predictions of change may be overly optimistic and are likely to miss the diversity in ways that new transportation technologies, such as car sharing, on-demand ride hailing, automated vehicles, bike sharing, etc., are adopted.

Using the Unified Theory of Technology Adoption and Use (UTAUT2) by Venkatesh et al. (2012), this study focuses on the role of ‘technology affinity,’ as a latent construct, on the adoption and use of new mobility technologies. This study uses survey data (N=3,958) collected in 2021 and recruited through Dynata, a research data firm, from a broader survey in the Greater Golden Horseshoe Region of Ontario, Canada, which comprises over ten million of Canada’s approximately 40 million residents.

Structural equation models (SEMs) are estimated to explore the relative role of technology affinity based in the UTAUT2 framework in explaining adoption of newer transportation mobility options. Findings suggest that singularly anticipating technology affinity to lead to increased adoption of newer technologies and less auto dependency is unlikely to materialize. Instead, new transportation technologies substitute for one another in niche cases - even while the role of classic travel modes (e.g. public transit and driving) remain dominant. There is significant spatial variation in the potential uptake of new technologies (especially in ones that rely on highly-localized scale economies, such as bike sharing). Even while technology adoption models, such as UTAUT2, are critical towards better understanding the evolution of mobility, adapting such models towards the specific application, such as transportation, is critical.



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1955 - A New Way To Curb Congestion A Us Nationwide Study On The Impact Of E Scooter Sharing On Urban Congestion

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Background:

Traffic congestion has become a critical and stagnating issue for modern cities, incurring economic losses, health concerns, and social inequalities. While studies have explored and argued how various shared mobilities can affect traffic either by interacting with public transit or by reducing reliance on driving, there is a lack of empirical evidence on whether e-scooter sharing – as a more recent type of micro-mobility – affects urban congestion levels.

Materials and Methods:

Using a Two-Way Fixed-Effect (TWFE) staggered difference-in-differences (DID) framework with data on ESS entry and control variables from 118 US urban areas, this study investigates the relationship between the entry of e-scooter sharing (ESS) and peak-hour congestion levels, measured by the Travel Time Index (TTI).

Results:

The model results show that ESS has no effect on urban congestion levels in the short run, regardless of whether it is immediately after service entry or two years after entry. Moreover, the treatment effect is even less pronounced in more humid urban areas, as captured by our model.

Conclusions:

The findings indicate that, despite common arguments about the ESS's ability to integrate with public transit and reduce driving, its impact on traffic congestion is insignificant in practice. This lack of significant association between ESS and congestion implies that ESS may be regarded as a provision of more mobility choices but not as a way to curb congestion.



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2216 - The “micromobility Hurdle” A Pooled Bivariate Probit Analysis Of Joint Membership In Shared Bike And E Scooter Systems Across Six Canadian Metropolitan Areas

Darren Scott¹, Matthias Sweet²

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As Canadian municipalities expand their micromobility options, the relationship between shared bike and e-scooter systems remains a critical policy frontier. This study uses data from the Future Mobility in Canada Survey (FMCS) to investigate the socio-demographic and attitudinal drivers of membership in these systems across six Census Metropolitan Areas (CMAs).

To address the geospatial variability of mode availability in 2023, where some cities offered only one mode while others offered both, this study employs a Pooled Bivariate Probit Model with alternative-specific availability constraints. This methodological framework allows for the joint estimation of membership probabilities while mathematically filtering choice sets based on municipal regulations. Furthermore, the model incorporates system propulsion type (manual vs. electric) as a key city-level predictor to assess how technological maturity influences the “participation hurdle.”

Preliminary findings focus on the correlation parameter, testing whether bikes and scooters act as functional complements that attract a single “micromobility-prone” segment, or as substitutes competing for a fixed user base. By integrating factor-analyzed attitudinal scores (e.g., tech-enthusiasm, safety anxiety) with built-environment data validated via 6-character postal codes, this research provides actionable insights for urban planners. The results highlight whether multimodal integration or mode-specific differentiation is the superior strategy for Canadian cities as they navigate the transition toward electrified, shared transportation ecosystems.



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2253 - Towards A Solar Electric Transport Corridor In The Amazon The Case Of The Bobonaza River Ecuador

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In remote regions in the Amazon, the provision and cost of fossil fuels create a significant barrier to mobility, particularly in those where waterborne mobility is the only option. Electrification powered by local renewable energy can play an important role in overcoming mobility constraints and accelerating decarbonization. The contexts of these communities differ from those in urban settings, since isolated grid management, extreme climatic conditions, and the availability of technological knowledge are additional considerations.

In the Amazon, there is little empirical data on mobility patterns, energy consumption, and costs, which limits informed decision-making on the transition to low-emission transport. Assessing river transport fleets, mobility patterns, and energy consumption allows for creating a baseline for establishing an electrification strategy along river corridors.

We conduct empirical research along the Bobonaza River in the Pastaza province in Ecuador to evaluate the opportunities and barriers to transitioning the river to the first electric mobility in the Amazon, where we collected data from boat operators and community leaders, along with semi-structured interviews and direct observation. Our analysis focuses on the feasibility of transition under local infrastructure, economic, and governance constraints.

Our findings reveal the costs of current transport options, mobility and accessibility restrictions, as well as the motivations of local communities to engage in and govern this transition process. The results identify a possible pathway towards electrification within the local mobility context and contrast the opportunities with limited energy infrastructure, river level variability, and institutional capacity.

When looking at the possible electrification strategy, with the aim of decoupling a transport system from fossil fuels, it is not enough to provide local energy, but rather it is better to improve economic accessibility and build capacity to use and maintain alternative propulsion systems. This study allows us to affirm the effectiveness of transition strategies if embedded in the local cultural context. In terms of practical implications, it also demonstrates how transitions towards electrification in remote regions are dependent on external agents and the challenges to create a sustainable governance system.



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2632 - Smart Information Unequal Flexibility How Advanced Traveler Information Systems Reshape Space Time Flexibility In Shopping Travel

Rui Shao¹

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Space-time flexibility refers to the extent to which individuals can freely decide when and where to travel. Advanced traveler information systems (ATIS), by providing real-time traffic information, are assumed to enhance such flexibility and contribute to more efficient and sustainable travel. However, whether ATIS increases space-time flexibility for all travelers remains unclear.

Using data from a face-to-face survey in Chengdu, China, this study examines how ATIS use is associated with space-time flexibility in shopping travel. Structural equation modeling is employed to explore both the direct relationship and the indirect pathways through which socio-demographic characteristics (age, education, income, employment status) and built environment factors (residential density, transit accessibility) shape ATIS use and, in turn, perceived flexibility.

Results show that ATIS use is positively associated with greater space-time flexibility. However, this relationship is socially and spatially differentiated. Individuals who are younger, more educated, and living in transit-poor areas benefit more from ATIS use, while older adults and those with limited digital familiarity experience comparatively lower gains in flexibility.

These findings suggest that ATIS does not serve as a neutral tool for improving travel efficiency, but as a socio-technical mechanism that redistributes space-time opportunities unevenly across population groups and urban contexts. The study highlights the need to incorporate equity considerations into smart mobility and information-based transport planning.



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C24.44-Transport Geography => Towards a Green and Safe Arctic Shipping Corridor



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1068 - Arctic Sea Route Access Reshapes Global Shipping Carbon Emissions

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Climate-driven Arctic ice melt is opening the Arctic Sea Route (ASR), providing shorter paths for global trade while also raising critical environmental concerns. Here, we quantify the long-term carbon consequences of ASR access using a trade-integrated shipping emissions projection (TISEP) model that integrates trade scenarios, vessel routing, and climate policy pathways. Our results indicate that ASR use will increase global shipping emissions by 8.2% by 2100, with Arctic emissions rising from 0.22% to 2.72%. At the same time, environmental disparities in exposure to emissions will increase since Northeast Asia, Northern Europe, and North America will experience particularly large increases in emissions due to rerouted shipping flows. We evaluate three mitigation strategies and find that two ongoing strategies, the 2023 IMO Strategy on Reduction of GHG Emissions from Ships and the Green Corridor strategy, are insufficient to achieve emission targets in the Arctic, but a net-zero strategy featuring stricter fuel standards and regionally phased rollout could fully eliminate ASR-related emissions. These findings highlight the urgent need for more prospective actions to reduce shipping emissions, protect the Arctic environment, and advance global environmental justice as Arctic navigability increases. More international actions for green shipping are important for both the Arctic and the rest of world.



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1202 - Seasonal Variability Of Ocean Dynamics Along The Arctic Northeast Passage

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Under ongoing climate warming, accelerated Arctic sea ice retreat and pronounced seasonal variability have substantially altered the navigational environment of the Northeast Passage (NEP), posing new challenges for simulating ocean dynamic processes that are tightly coupled with evolving ice conditions. Accurate representation of seasonal ice margins, narrow straits, and tide–circulation interactions is therefore essential for understanding the temporal variability of the Arctic shipping route.

In this study, we focus on the NEP and develop a regional multi-resolution nested grid system designed to resolve the complex ice–ocean–topography coupling characteristic of the Arctic. Grid resolutions are configured according to dominant physical regimes, with ~60 km in deep basins, ~15 km over continental slopes, ~3–5 km on continental shelves, and further refinement to better than 3 km in shipping corridors and strait-dominated regions. Based on this grid, year-long simulations for 2023 are conducted using the Finite Volume Community Ocean Model (FVCOM) coupled with a sea ice module. Tidal forcing is prescribed from FES2022, temperature and salinity boundary conditions from GOFS 3.1, and atmospheric forcing from JRA-3Q. Model performance is evaluated using tide gauge sea level observations and reanalysis current data.

The results reveal strong seasonal modulation and spatial heterogeneity in the NEP ocean dynamic system. Sea surface height variability remains weak and spatially stable in the ice-covered central basins, while continental shelves and narrow straits consistently exhibit large fluctuations and represent regions of highest dynamic uncertainty during the navigation season. During summer ice retreat, expanded open water areas enhance sea level variability and surface current speeds, forming more continuous high-velocity pathways; in contrast, winter ice growth suppresses tidal amplitudes and currents through enhanced ice–water friction. Harmonic analysis indicates that the semidiurnal M₂ constituent dominates the tidal regime and governs the seasonal background variability, whereas the diurnal K₁ constituent, although weaker in amplitude, exhibits stronger phase sensitivity in straits and island-rich regions. Based on ice concentration thresholds, navigability analysis shows that the NEP was fully passable for Polar Class 7 vessels from early August to mid-October in 2023. These findings elucidate the temporal evolution of Arctic ocean dynamics and provide a dynamic basis for Arctic shipping assessment and route planning.



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1782 - North American And European Sanctions Russia's Eastward Pivot And The Northern Sea Route A Quantitative Assessment Of Substitution And Risk For China's Energy Shipping Corridors

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Western sanctions and Russia's strategic reorientation toward Asian markets have accelerated the use of the Northern Sea Route in Russia–China oil and gas trade. This route is expected to reduce China's reliance on traditional chokepoints such as the Malacca–Suez corridor and to enhance maritime energy security. The study hypothesizes that: (1) sanctions and Russia's eastward pivot significantly increase the relative weight of Arctic routes in Russia–China energy shipping; and (2) this substitution reshapes, rather than simply reduces, China's multidimensional risk exposure by trading chokepoint risk for sanction, geopolitical, and polar environmental risks.

The study builds a panel data set of Russia–China seaborne oil and gas shipments by route, combining vessel movement data, port statistics, sanction announcements, and open-source environmental and security indicators. A difference-in-differences design treats Arctic-related routes as the treatment group and traditional Malacca–Suez routes as the control group, with major sanction waves in 2014 and 2022 as policy shocks. Panel regression models estimate the impact of these shocks on route choice, shipment volumes, and a constructed route-specific risk exposure index covering geopolitical, sanction and compliance, and natural and navigational risks. Exponential random graph models are used to analyze the evolving structure of the Russia–China energy shipping network and the changing centrality of Arctic versus traditional routes.



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2103 - Arctic Shipping Opening And Socio Economic Transformation Pathways Opportunities And Vulnerabilities Under Climate Change

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Background / Hypothesis

Climate-induced sea ice decline is increasing the accessibility of Arctic maritime space, raising critical questions about how Arctic shipping opening may reshape regional development and socio-economic systems. While existing studies often examine navigability changes or economic opportunities separately, this study hypothesises that Arctic shipping opening drives a multi-dimensional socio-economic transformation involving transport connectivity, resource accessibility, and local food systems, generating both opportunities and vulnerabilities.

Materials and Methods

An integrated, scenario-based framework is applied. Arctic navigability is assessed using sea ice simulations under different Shared Socioeconomic Pathways (SSPs) to project future seasonal shipping accessibility. These projections are combined with global trade forecasts and Arctic transport diversion simulations to examine the evolving role of Arctic routes in global shipping networks and port development. Spatial analyses of Arctic oil, gas, and critical mineral resources are further conducted, alongside an assessment of transport-related impacts on Indigenous and local food systems.

Results

Results suggest that improved Arctic navigability enhances the strategic importance of Arctic shipping routes, promoting port-centred economic growth and accelerating resource extraction and industrial activities. However, benefits are unevenly distributed, reinforcing concentration around key ports and resource hubs. In the short term, intensified shipping may disrupt Indigenous subsistence practices, while in the longer term, improved connectivity is likely to enhance the reliability of food, essential goods, and emergency supply chains for remote Arctic communities.

Conclusions

The opening of Arctic shipping routes is transforming the Arctic from a geographically isolated periphery into a more integrated component of global transport and resource networks. This transformation is characterised by resource-led development pathways, port-centred economic polarisation, and persistent socio-economic and food security vulnerabilities, highlighting the need for green, safe, and socially inclusive Arctic shipping corridors under climate change.



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C24.44-Transport Geography => Towards Regional Integration: Ports and Corridors of Cross-Border Transport



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1137 - Do Multiple Port Regions Enhance Disruption Recovery Of Liner Shipping Global Evidence From Vessel Port Skipping Behavior

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Unexpected disruptions frequently cause port congestion and undermine schedule reliability in liner shipping. Port skipping is a key recovery strategy that reduces delay costs but introduces additional transition costs. Multiple Port Regions (MPRs) shape this response through two opposing mechanisms: a proximity effect, in which diversion to nearby ports lowers transition costs, and a spillover effect, in which correlated disruptions within the same region raise expected delay costs when diverting to a port within MPR. This study develops a global empirical framework combining vessel Automatic Identification System (AIS) trajectory data, a DBSCAN-based delineation of MPRs, and a Multinomial Logit (MNL) model to analyze vessels' choices among waiting, skipping within the MPR, and skipping outside it. We show that spillover effects substantially reduce the reliability of within-MPR alternatives, often outweighing the transition-cost advantage generated by geographic proximity. Empirically, rising congestion significantly increases outside-MPR skipping, while within-MPR skipping is generally suppressed. Mechanism analysis reveals strong spatial dependence in port congestion, indicating that correlated disruptions dominate proximity benefits. Heterogeneity analysis shows that this dominance is stronger in high density MPRs, where congestion spillovers are more pronounced, whereas low density MPRs exhibit less variable substitution patterns due to long sailing distances. Extensive robustness checks using alternative MPR definitions and imbalance mitigation procedures confirm the stability of these results. These findings imply that MPRs do not necessarily provide operational redundancy and that congestion spillovers must be explicitly accounted for in disruption-management and regional port-planning strategies.



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1320 - Cross Border Transport And Border Effect In The Guangdong Hong Kong Macao Greater Bay Area

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Due to historical factors, the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) operates under the unique “one country, two systems” framework. Enhancing transportation integration and connectivity between Hong Kong, Macao, and the Chinese mainland is critical for the GBA’s high-quality development. Existing border studies mainly focus on national (supranational) or domestic administrative boundaries, with insufficient attention to the GBA’s unique institutional differences and a lack of dynamic border effect measurements using big traffic data. This study constructs a GBA traffic flow network using 2021 and 2023 highway toll data and cross-border traffic data, applying complex network analysis and border effect measurement to explore the network’s spatial structure and dynamic border effect changes. Results show the GBA traffic flow network has a distinct “dual-core edge” structure, with Guangzhou-Foshan and Shenzhen-Dongguan-Huizhou as cores; passenger flow networks outperform freight flow in overall coverage and connectivity. For Hong Kong-Macao related traffic, 2023 saw significantly higher network coverage and density than 2021, with flows extending northward across borders, advancing transportation integration and forming a “cross-strait connectivity, full-area interconnection” pattern. However, Hong Kong and Macao remain less important in the network due to their peripheral positions and border effects. Border effect measurements reveal significantly higher obstruction coefficients between Hong Kong/Macao and the mainland than among mainland counties, with lower coefficients for passenger vehicles than freight. Post-pandemic, the GBA traffic network’s obstruction coefficients dynamically increased, indicating reduced border obstruction. This study expands the quantitative research framework for border effects in traffic networks, promoting GBA transportation integration and supporting its overall integration goals.



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C24.44-Transport Geography => Transport Geography in Africa: Infrastructure, Mobility, and Social Transformation



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1077 - The Unequal Benefits Of Mobility Apps For Women In The Global South

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Across major cities worldwide, the growing use of mobile apps (e.g., use of transport and navigation apps in smartphones) is producing diverse and shifting effects at multiple scales. These effects transform everyday practices, generate new spaces and spatialities, and reconfigure the dynamics of urban life. Situated within the field of digital geographies, this research analyses how mobile apps designed to tackle mobility constraints are reshaping women's mobilities by bringing the focus to rapidly expanding urban contexts with highly constrained mobilities of the Global South.

This study relies on qualitative interviews with 63 women, both users and non-users of mobile apps, from varied socio-economic backgrounds in Kinshasa (Democratic Republic of Congo) and Pune (India). 24 experts, including app providers, institutional representatives, researchers, and NGO actors, were also interviewed. These semi-structured interviews were enriched with participatory observations.

The analysis offers a complementary perspective on two Global South cities, which differ regarding mobile apps across access, adoption, and use. The findings reveal the interrelated mechanisms through which mobile app use reshapes women's everyday mobilities and, conversely, the ways in which everyday mobilities in turn condition the use of mobile apps. Overall, the use of mobile apps can positively reshape women's everyday mobilities and daily planning by lowering certain barriers, expanding transport options, optimising time management, and giving a stronger sense of control over daily life. At the same time, such technologies tend to reproduce, reinforce, and sometimes even create intersectional inequalities.



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1123 - Beyond Passenger Transport The Role Of Motorcycle Taxis As Integrated Logistics Providers In Ugandan Regional Cities

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This study aims to clarify the diverse services provided by motorcycle taxis in Uganda regional cities and argues that paratransit functions as an integrated transport mode for both people and goods. In Sub-Saharan Africa, where formal transport is often inadequate, minibuses, three-wheeler taxis and motorcycle taxis underpin daily mobility. These modes of transport have been collectively referred to as either paratransit or informal transportation, serving as a supplement to public transport [Behrens et al. 2021; Cervero 2000]. While these modes transport goods alongside passengers, existing concepts have primarily focused on passenger mobility, overlooking small-scale cargo and delivery functions.

This study is based on a total of 1 year and 9 months of field research in Masaka City, Uganda. Data was collected by asking drivers to record the details of daily requests and the earnings. The results revealed that motorcycle taxis transport passengers over various distances and carry a wide range of goods, including food, cash, and construction materials. Furthermore, they provide value-added services such as proxy purchasing, exceeding the role of a mere carrier. These findings indicate that paratransit supports regional mobility as a comprehensive service provider. This presentation proposes the necessity of a new transport concept that integrates passenger and cargo logistics.



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1219 - Inclusive Connectivity Spatial Dynamics And Determinants Of Transport Infrastructure Under Chinese Development Finance In Africa

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Chinese Development Finance has emerged as an important contributor to regional connectivity and corridor-oriented development across Africa. However, existing studies on Chinese Development Finance have largely focused on overall infrastructure investment, with limited attention paid specifically to transport infrastructure. Drawing on the AidData dataset, this study employs spatial analysis and machine learning methods to examine the spatial dynamics and determinants of transport infrastructure under Chinese Development Finance in Africa from 2000 to 2025. The results demonstrate that such infrastructure has followed a three-stage evolutionary trajectory—localization, expansion, and retrenchment—accompanied by a spatial reorientation from Central to East and subsequently to West Africa. Angola, Kenya, Nigeria, and Ethiopia emerge as the principal host countries. Project locations exhibit a strong concentration along development corridors and regional hubs. Chinese Development Finance favors host countries characterized by large market size, insufficient infrastructure provision, abundant natural resources, strong bilateral relations, and elevated economic risk. These findings reveal pronounced spatial selectivity and unevenness in Chinese-financed transport infrastructure. Overall, this study provides spatially explicit empirical evidence on China-Africa development cooperation and its spatial implications for China's Going Global strategy, while also offering important policy insights for African countries on mitigating spatial disparities and enhancing the inclusiveness of transport infrastructure development financed by external actors.



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1308 - “i Just Ordered For A Ride And Not A Relationship” Exploring The Gendered User Experiences Among Ride Hailing Patrons In A Low Income African City

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Background

Ride-hailing services –which match drivers and potential passengers through online platforms –have in recent years changed the performance characteristics of urban transport across the globe. Optimistic commentators have argued that ride-hailing and the sharing economy potentially grant equal opportunities to all citizens by promoting access to greater socio-economic benefits and urban development (Chen et al., 2023). Meanwhile, a divergent school of thought (Siddiq & Taylor, 2024; Qiao, Zhang & Yeh, 2023) have emphasized the potential of ride hailing to (re)produce transport poverty and promote social exclusionism, especially for vulnerable groups such as women.

This paper contributes to the ongoing discourse by highlighting the gendered experiences associated with ride-hailing use among males and females in a developing world context. This paper attempts to find responses to three critical questions: (1) does trip purpose vary for male and female users of ride-hailing services? (2) are there gendered differences in the utility derived from the ride-hailing experiences of males and females? and (3) do male and female passengers adopt different coping mechanisms to challenges associated with use of ride hailing services?

Materials and methods

The study triangulated quantitative data (n=378) and qualitative interviews (n=20) and adopted the Activity Space, Spatial Justice and Objectification Theories as interpretive lenses.

Results

The data shows evidence of significant variations in the frequency at which males and females are confronted with various challenges when they use ride-hailing services, ranging from sexual harassment, discrimination and disrespect from drivers, security threats, attempted theft and kidnapping.

Conclusions

The study suggests that gendered perspectives could be a key factor in unearthing and addressing the challenges confronting ride-hailing users in the study area.



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1382 - Towards African Integration The Structural Evolution Of Air Transport Network From 1996 To 2024

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Air transport often takes an important role in promoting cross-border mobility and market integration in Africa, thereby shaping the inter-city connections and its continental urban hierarchy. Still, African aviation liberalization has progressed unevenly across countries. In this study, we compare the influence of two continent-wide initiatives in African air transport network, namely, the Yamoussoukro Decision (YD, 1999) and the Single African Air Transport Market (SAATM, 2018). We hypothesize that SAATM has produced measurable connectivity gains for signatories, compared to YD. Using OAG scheduled flight data from 1996 to 2024, we build weighted, undirected city networks aligned with four periods. We quantify the topology, multi-dimensional centralities, and community structure of the African air transport network via the Leiden algorithm. To estimate policy effects of two initiatives, we implement a difference-in-difference model that compares signatory (treatment) and non-signatory (control) countries before and after SAATM launch in 2018, using network attributes such as nodal centrality, connectivity, and inter-community integration as dependent variables. We find that the network expanded substantially but remains a hub-periphery hierarchy in African cities in the periods studied. The community structure of the African air transport network shifted from colonial and linguistic blocs toward several regional clusters connected. Difference-in-differences estimates show limited significant effects for YD, whereas SAATM is associated with significant increases in the connectivity and the cross-community linkages among those African signatory countries ($p < 0.05$). Spatially, Addis Ababa and Nairobi rose obviously as continental gateways, North African hubs such as Cairo remain stable, and Southern African hubs such as Johannesburg declined relatively. In brief, this study confirms that binding institutions during the aviation liberalization can reduce fragmentation in the air transport network but may amplify spatial inequality locally.



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2002 - Spatial Vulnerability Assessment Of African Transportation Infrastructure To Extreme Weather

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Africa is increasingly exposed to extreme weather events, most notably prolonged droughts and devastating floods. These events exert mounting, spatially heterogeneous pressures on its underdeveloped transportation infrastructure. These climatic shocks, amplified by global warming and land-use changes, disrupt mobility networks, accelerate infrastructure degradation, and amplify existing inequalities in regional accessibility. As transportation networks are the backbone of economic connectivity and social development across the continent, climate-induced hazards pose severe threats to the structural integrity, operational capacity, and long-term sustainability of these systems. This study conducts a systematic assessment of the vulnerability of Africa's transportation infrastructure to extreme weather events, integrating multi-source datasets on hydroclimatic hazards, geospatial infrastructure attributes, and socioeconomic exposure. By establishing a spatial coupling framework between the spatiotemporal dynamics of climate extremes (e.g., drought duration, flood inundation extent, intensity anomalies) and network characteristics (e.g., density, centrality, connectivity), the research quantifies and visualizes risk gradients across diverse ecological and infrastructural contexts. Spatial overlay analysis and quantitative risk mapping are employed to identify high-risk corridors and vulnerability hotspots, highlighting spatial clusters where infrastructure exposure and hazard intensity coincide. The findings advance understanding of the spatial interplay between climate extremes and transportation networks in Africa, providing empirical evidence for vulnerability differentiation across climatic zones and infrastructure typologies. Furthermore, the study develops a decision-support framework for climate-resilient infrastructure planning, emphasizing adaptive design, proactive maintenance, and region-specific mitigation measures. By pinpointing critical risk areas, this research offers actionable insights for policymakers and planners to enhance the robustness, reliability, and resilience of Africa's transportation systems under intensifying climate variability.



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2429 - The Impact Of The Mombasa–nairobi Standard Gauge Railway On Passengers’ Happiness And Well Being A Study Based On Maslow’s Hierarchy Of Needs

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This study examines how the Mombasa–Nairobi Standard Gauge Railway (SGR) influences passengers’ quality of life and need fulfillment, applying Maslow’s Hierarchy of Needs as a human-centered analytical framework. Based on 88 questionnaires and 53 structured interviews, the research investigates five dimensions of need satisfaction—physiological, safety, love and belonging, esteem, and self-actualization—through a mixed-methods design integrating quantitative and qualitative insights.

Findings demonstrate that the SGR has markedly improved passengers’ physical comfort, safety, and social connectivity. Physiological and safety needs received the highest satisfaction scores, while belonging and esteem needs were fulfilled through enhanced family visits, community participation, and respectful service interactions. Self-actualization needs—linked to education, employment, and cultural mobility—emerged as transformative yet unevenly distributed. Qualitative interviews further reveal that the SGR has reshaped perceptions of time, distance, and modernity, encouraging punctuality (“No more African time”) and enabling new forms of family tourism, inter-county education, and cultural exploration.

Beyond the empirical findings, this study underscores the global significance of studying transport infrastructure in the Global South. African transport systems remain underrepresented in well-being research despite their profound role in shaping social inclusion, regional integration, and human development. By positioning the SGR as a case of infrastructure-induced social transformation, this research contributes to decolonizing transport studies and expanding the geographical scope of mobility and happiness scholarship. It argues that understanding how large-scale projects fulfill human needs in Africa is essential for building equitable, sustainable, and human-centered development models in the Global South.



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2770 - Algorithms Versus Asphalt “smart Informality” And Tactics For Diversion By Ride Hailing Drivers In Cotonou

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Umr Idees, Geography, Le Havre-France ¹

In West African cities, the introduction of digital transportation platforms (ride-hailing services) is often presented as a transition toward standardized and transparent mobility. However, a survey of 1,440 respondents and field observations reveal a major paradox: far from submitting to the rigidity of the algorithm, Beninese taxi drivers are appropriating the tool to reinforce their own informal practices. This paper examines this power struggle: how do drivers transform a technology of control into a tool of “active resistance”?

Rather than analyzing adoption as a technical success or failure, we explore the “tactical agency” of drivers. First, we analyze the phenomenon of “off-platform transactions”: the smartphone serves as bait for connecting people, but the transaction is immediately extracted from the algorithm to avoid commission and reinjected into the economy of direct negotiation. Second, we reveal the conflict between “GPS truth” and “asphalt science.” Faced with an algorithm that ignores road conditions (sand, seasonal flooding) or informal roadblocks, drivers impose their own geography. Digital technology does not erase informality; it becomes an additional layer that drivers manipulate to preserve their profitability and safety. It is a form of “Smart Informality” where drivers remain in control of the spatial game.

In conclusion, this paper demonstrates that the failure of standardization is not evidence of archaism, but rather a strategy for economic survival. For local platforms such as RMobility, the challenge is no longer to “discipline” drivers, but to co-develop technology that embraces African flexibility. The sustainability of these systems will depend on their ability to become “hybrid platforms,” capable of translating the rationality of algorithms into the language of urban resourcefulness (Vasconcellos, 2014; Möhlmann et al., 2019; Ehebrecht et al., 2018).



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C24.44-Transport Geography => Transport Shaping Space at Local, National and Global Levels



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1485 - Facilitating Transit Oriented Development With Integration Between Investment In Tram Trains And Strategic Land Use Planning

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Transit-Oriented Development (TOD) is a widely adopted urban planning tool. However, there is often a serious mismatch between strategic land use planning policies and expensive rapid transit investment that undermines TOD's objectives. Cheaper hybrid Tram-Trains are light rail vehicles that can operate safely on both heavy and light rail lines.

The research examines the degree of synergy between investment in Tram-Trains and strategic land use planning and regeneration focussing on five UK conurbations and three cities in Germany and Denmark. Integration can facilitate TOD. However, mismatch is frequent when transit and land use plans are developed separately in 'silos' rather than as an integrated package.



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1583 - The Dynamics Of Europe's Economic And Demographic Centres Along Long Term Trajectories (1960–2020)

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Background / Hypothesis

The spatial organisation of Europe has undergone profound economic, demographic and political transformations over the last six decades. While previous studies have often analysed changes in accessibility, population or economic potential separately, fewer contributions have examined the long-term trajectories of European centres using a unified centrophraphic framework. The EU-CEN-TRA (European Centre Trajectory) project hypothesises that shifts in Europe's economic and demographic centres are path-dependent, non-linear and strongly conditioned by changes in spatial extent, border permeability and road accessibility over time.

Materials and Methods

The analysis covers the period 1960–2020 and is based on harmonised population and economic datasets at the NUTS3 level for the entire European continent. Centrophraphic measures are combined with multiple dimensions of the potential model, including spatial decay functions, road travel time, transport infrastructure development and border restrictions. Several methodological variants are applied to capture alternative assumptions regarding distance, time and spatial interaction.

Results

Preliminary results reveal distinct but interconnected trajectories of Europe's demographic and economic centres, with periods of acceleration, stabilisation and reorientation. The trajectories differ depending on the applied potential dimension, highlighting the importance of accessibility improvements, particularly during periods of European integration and enlargement.

Conclusions

The first results of the EU-CEN-TRA project demonstrate the analytical value of combining centrophraphic measures with multidimensional potential models to study long-term spatial dynamics. The trajectory-based approach offers new insights into Europe's evolving spatial structure and provides a consistent framework for comparative analyses across time, methods and territorial scopes.



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1697 - Perceptions Of Rail Transport In Suburban Areas In Poland Implications For Transit Oriented Development

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Rail transport infrastructure contributes to development processes and drives changes in land use and land cover in surrounding areas. However, it should be emphasised that rail transport shapes space in a symbolic dimension by influencing individuals' perception of rail neighbourhoods. Rail neighbourhoods can be perceived positively through the prism of accessibility and opportunities, or negatively, as a source of inconveniences such as noise or physical barriers.

The way individuals perceive rail transport can influence their subsequent decisions regarding travel modes and residential location choices. Understanding the factors that shape these perceptions should therefore constitute a fundamental basis for planning, particularly in the context of future Transit-Oriented Development (TOD) investments. Otherwise, there is a risk that TOD may fail to genuinely affect the overall modal split in specific areas and instead appeal only to a narrow, pro-transit group, following a self-selection mechanism.

The aim of this paper is to identify the key factors influencing perceptions of rail transport. The paper presents the findings of a questionnaire survey conducted among residents of rail neighbourhoods in the suburban areas of Wrocław, Poland. The analysis explores the relationships between perceptions of rail transport and selected characteristics of the rail system, including the type of rail infrastructure, its level of accessibility, the design of rail stations, and applied technical and engineering solutions. The study also examines how perceptions of rail transport translate into travel mode choices. Ultimately, the results provide a basis for answering the question of which features and attributes rail infrastructure should possess in order to be perceived positively by local residents, particularly in the context of TOD.



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1819 - Understanding The Impacts Of Regional Rail On The Metropolitan Spatial Structure Insight From The Seoul Great Train Express

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Urban transportation is a fundamental force in shaping cities. Particularly in metropolitan areas, urban rail systems have long played an important role in (re)shaping urban structures by influencing accessibility and land-use development. In recent decades, especially in megacities, regional and commuter rail systems have been increasingly introduced not only to reduce commuting time but also to connect inner cities with suburban areas in the widening metropolitan territory.

The case study of this research is the Great Train eXpress (GTX), a new high-speed regional rail system in the Seoul Metropolitan Area, South Korea. From a transport perspective, the GTX aims to enhance mobility for residents in new towns by enabling commutes to reach the city centre within 30 minutes. This rapid connectivity compresses time-space distances and may reinforce a more monocentric metropolitan structure. However, from a spatial planning perspective, the GTX is expected to promote the development of multiple transport hubs, thereby fostering decentralisation.

This study applies a two-stage research design. First, it synthesises findings from existing empirical studies on the impacts of regional rail on urban spatial structure. Second, it conducts a case study analysis of the Seoul GTX to examine the spatial characteristics of the Seoul Metropolitan Area and the potential spatial effects associated with the introduction of high-speed regional rail.

This study highlights that while regional rail systems consistently deliver improvements in commuting efficiency, their impacts on urban spatial structure vary significantly across cities and are highly context-dependent.

As the GTX system in Seoul is still under construction, this study provides a basis for anticipating future urban spatial restructuring associated with the opening of the GTX-B and GTX-C lines and for proposing appropriate urban planning strategies.



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1982 - Evaluating The Linkage Between Road Connectivity Accessibility And Urban Growth A Case Study Of North Bengal India

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Urbanization represents the societal transition from rural to urban living, characterized by two primary metrics: the “Level of Urbanization” and the “Rate of Urbanization.” This study aims to analyze how the road network dictates “Potential Accessibility” within North Bengal, subsequently driving the urbanization process.

Inter-urban road connectivity comprises the network of highways and roads linking urban centers to facilitate the efficient movement of goods and people. By lowering transportation costs, reducing travel time, and expanding access to markets and employment, this connectivity serves as a cornerstone for regional economic growth, social integration, and productivity. Within this framework, the northern districts of West Bengal—collectively referred to as “North Bengal”—exhibit a unique relationship between their road networks and regional accessibility.

Cities are viewed as supreme hubs of human interaction, where passenger traffic is driven by commuting, commerce, and culture. However, cities are equally vital as centers for the production and distribution of freight. Connectivity and urbanization function as a “two-way process”; while infrastructure facilitates growth, expanding urban spaces and their requirements simultaneously generate the demand for enhanced connectivity. These elements are fundamentally interrelated and inseparable.

The impact of connectivity on urbanization varies significantly across India’s diverse landscape. Because of its strategic geographical position, the “connectivity-urbanization” dynamic in North Bengal exerts a profound influence on its surrounding territories. Today, this relationship is being further reshaped by rising transnational trade and central government initiatives like the “Act East Policy.” Given these shifting dimensions, it is essential to observe how these geopolitical factors are currently transforming the region’s transport and urban landscape.



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2522 - Assessing The Use And Potential Of Cycling Infrastructure In Mexico City A Spatial And Multiscalar Approach

Victor Reyes ¹, Manuel Suarez ², Javier Delgado ²

Unam, Iiec, Mexico-Mexico ¹ Unam, Igg, Mexico-Mexico ²

Cycling has gained prominence in urban mobility agendas as a sustainable alternative to motorized transport. However, the expansion of cycling infrastructure is often evaluated in terms of coverage rather than its effective use or territorial equity. This paper assesses the relationship between cycling infrastructure and bicycle travel in Mexico City through a spatial and multiscalar analytical framework.

Using publicly available data, two complementary indicators are developed. The Cycling Infrastructure Use Index (IUI) measures the correspondence between the proportion of bicycle trips and the proportion of cycling infrastructure length across traffic districts, identifying areas of overuse, underuse, and critical gaps where cycling trips occur without dedicated infrastructure. The Potential Cycling Use Index (IPUV) estimates latent demand by relating the availability of bicycles in households to existing cycling infrastructure, highlighting zones with unmet potential for modal shift. Both indicators are constructed from open mobility, census, and infrastructure datasets and are designed to be replicable across urban contexts.

Results reveal marked spatial inequalities. Central districts concentrate cycling infrastructure with relatively low levels of use or potential demand, while peripheral and eastern districts exhibit high current and potential cycling activity in the absence of adequate infrastructure. These mismatches suggest that recent investments have not consistently aligned with observed mobility patterns or household-level availability of bicycles. To refine the analysis, city-scale indicators are complemented with topographic assessment using raster-based slope analysis and high-resolution digital elevation models generated from drone imagery in selected areas, allowing evaluation of physical constraints on cycling at the local scale.

The findings demonstrate that evaluating cycling infrastructure requires moving beyond aggregate measures toward spatially explicit indicators that integrate demand, potential use, and physical conditions. The proposed approach contributes to urban geography and mobility research by offering a scalable, data-driven framework to inform more equitable and effective cycling infrastructure planning in large metropolitan areas.



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2665 - A Node Place Accessibility Ridership Per Time Model To Evaluate Micromobility Friendly Transit Oriented Development Potential In The Hauts De France Region

Dylan Moinse ¹, Alain L'hostis ², Ahad Amini Pishro ³, Xavier Lehmann ², Shiquan Zhang ⁴, Olivier Theureau ², Heythem Adjero ², Yuetong Liu ⁴, Qixiao Hu ⁴

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Introduction

This study investigates the development potential of station areas in the Hauts-de-France region through an extended version of the Node-Place Model (NPM), aiming to support micromobility-friendly Transit-Oriented Development (TOD) strategies.

Methodology

We introduce the Node-Place-Accessibility-Ridership-Time (NPART) model, a multi-criteria framework that captures the interplay between public transport provision and the socio-economic, spatial, and functional characteristics of station environments. The model incorporates advanced geostatistical analysis and machine learning tools.

Key Innovations

NPART advances the original NPM framework through four major extensions: (i) a novel application in a polycentric and under-researched region; (ii) the integration of design quality and dynamic ridership data; (iii) a differentiated analysis of walk-and-ride and bike-and-ride station areas; and (iv) the development of a spatial typology based on accessibility and intermodal potential.

Results

Our findings highlight the ability of the model to reveal hidden development opportunities, especially in intermediate station areas. A typology of rail-served zones was established, distinguishing three classes: rail-oriented, adjacent activity, and car-centered areas. Half of the stations fall into the intermediate category, showing promising potential for M-TOD initiatives supported by walking and cycling.

Implications

The NPART model demonstrates strong potential as a planning support tool for regional authorities. By identifying spatial disparities in multimodal accessibility, it provides actionable insights for refining TOD strategies and prioritizing investment. This contribution is particularly relevant in the French context, where quantitative TOD and M-TOD assessments remain rare despite pressing sustainability goals.



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2717 - Transport Shaping Rural Space Public Transport Accessibility And Spatial Inequity In Central Europe And The Alpine Region (1990–2025)

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This paper examines how long-term changes in public transport systems have shaped rural space in Poland, Czechia, Slovakia, Austria, and Switzerland. Emphasising the temporal dimension highlighted in the session theme, the study traces the evolution of local public transport accessibility over more than three decades (1990–2025) and analyses how differing institutional and policy trajectories have produced persistent patterns of spatial inequity.

Using a multi-temporal comparative framework, the research assesses public transport accessibility across 1,094 rural settlements located in 114 municipalities across the five countries. While the post-socialist countries shared broadly similar starting conditions in the early 1990s, subsequent transport reforms led to markedly different spatial outcomes. The analysis contrasts Poland's market-led deregulation of rural public transport—often associated with traffic shadows and transport deprivation—with the more coordinated, standards-based regional authority models developed in Czechia and Slovakia, which have sustained comparatively higher levels of rural accessibility.

The Alpine countries provide an additional comparative perspective. Switzerland emerges as a case of long-term commitment to coordinated public transport provision and service standards, whereas Austria exhibits more uneven rural accessibility outcomes than is often assumed, in some cases falling below those observed in Czechia. These contrasts demonstrate that physical geography alone does not determine rural accessibility; rather, institutional design and governance arrangements play a decisive role.

The findings show that transport systems do not merely serve rural space but actively shape it. Persistent accessibility deficits contribute to long-term social exclusion, demographic change, and the marginalisation of rural areas within national transport hierarchies. By linking public transport provision with institutional path dependence and spatial governance, the paper offers a comparative framework for understanding how rural “place” is produced and reproduced through transport policy over time.



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**C24.45-Urban Commission: (Re-)Thinking Cities
and the Urban: From the Global to the Local =>
Cities and Urban Systems: Drivers of, or Driven by
Transformational Change?**



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1136 - Urban Amenities Risk Inequality And The Decoupling Of Well Being In Resource Based Cities

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While the negative link between natural resource dependence and economic growth is well-documented, the mechanisms through which resource dependence shapes subjective well-being (SWB) at the urban scale remain underexplored. This study investigates the “happiness resource curse” in China, hypothesizing that resource-based cities (RBCs) and non-resource-based cities (NRBCs) exhibit structurally different well-being determinants. Using a national survey dataset and an interpretable machine learning framework (XGBoost–SHAP), we uncover the non-linear and heterogeneous effects of urban amenities on happiness across different income groups. The results reveal a “decoupling” phenomenon: while resource extraction boosts per capita GDP in RBCs, it fails to translate into commensurate happiness gains and is associated with increased SWB dispersion. We identify a critical divergence in governance logics: well-being in NRBCs is “efficiency-sensitive,” driven by mobility and urban functionality, whereas well-being in RBCs is “risk-sensitive,” predominantly constrained by safety infrastructure and resilience against hazards. Furthermore, heterogeneity analysis shows that in RBCs, economic growth exacerbates “risk inequality.” Low-income residents focus on immediate exposure risks (e.g., flooding), while high-income groups prioritize systemic stability, leading to a widening happiness gap. These findings challenge the assumption that growth uniformly enhances well-being, suggesting that breaking the happiness resource curse requires shifting urban governance from extraction-oriented production to risk-resilient livability.



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1142 - Economic Integration Of Prefectures In Modern Japan From Urban Systems Perspective

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Background/hypothesis

- This study aims to elucidate the formation process of urban systems in modern Japan by examining prefectural areas, focusing on centrality and corporate location.
- During Japan's modernization, the country experienced population urbanization. At this time, companies emerged that formed branch networks within prefectural areas. This can be interpreted as the economic integration of prefectural area. However, some regions remained difficult to integrate even during the modern period. This study focuses on the process of prefectural integration, examining factors that promoted or inhibited it.

Materials and methods

- The target regions were Saitama Prefecture and Aomori Prefecture in Japan, both newly territorialized during the modern period. The former is located near the major city of Tokyo, while the latter is distant from major urban centers. The methodology involved analyzing the distribution of centrality and the evolution of corporate location patterns using national census data and historical sources.

Results

- The results show that corporate mergers in Saitama Prefecture lagged behind other prefectures, preventing the formation of a hierarchical urban system centered on the prefectural capital city. Furthermore, corporate mergers revealed connections with Tokyo, confirming the process of forming a metropolitan area before the establishment of commuter zones.
- In Aomori Prefecture, the process of corporate mergers, such as banking consolidation, was also delayed. However, due to its distance from major cities, an urban system ultimately formed with the prefectural capital city at its apex, achieving economic integration of the prefectural area.

Conclusion

- The above demonstrates that the integration of prefectural areas depends on pre-modern power relations. However, while regions distant from major cities ultimately integrated at the prefectural scale, areas near major cities showed a tendency for incorporation into the metropolitan area to prevail over integration at the prefectural level.



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1285 - Changes In Residential Preferences In Japan Following The Covid 19 Pandemic

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The COVID-19 pandemic affected internal migration, with signs of an urban exodus being reported in several countries. However, some studies in Japan regarded this trend as a temporary shift, necessitating the need for verification using empirical data. Therefore, this study conducted a nationwide survey on residential preferences in Japan to predict domestic population mobility following the pandemic.

The data used in this study were collected via an online survey in March 2023, with the distribution and collection outsourced to a specialized survey company. The respondents were residents aged 16 years and older, sampled at 500 individuals per prefecture to avoid age and gender bias, yielding responses from 23,500 individuals. The survey items included “satisfaction with the current place of residence” and “preferences for prefectures to live in among other prefectures.” For comparison, results from a similar nationwide survey conducted by Japan Broadcasting Corporation (NHK) in 1996 were used.

An analysis of preferred destinations revealed that respondents’ preference for metropolitan areas increased in 2023 compared to 1996, with some differences among regions. This is consistent with the recent trend of nationwide population movement. A detailed analysis of preferred destinations by prefecture demonstrated that the relationship between prefectures in terms of preference shifted toward a tripolar structure consisting of Tokyo, Osaka, and Fukuoka, with Tokyo becoming increasingly dominant. Meanwhile, residential satisfaction with current locations declined overall in rural areas but increased in metropolitan areas. Approximately 30% of people changed their attitudes toward relocation during the pandemic, divided between those preferring large cities and those preferring rural areas. Consequently, while Japan’s population concentration in metropolitan areas is expected to continue, migration destinations are anticipated to diversify.



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1402 - Shifting Land Value Capture Instruments For The Grand Paris Express Metro Metropolitan Governance Local Trade Offs And Urban Outcomes

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In a context of budgetary austerity, land value capture (LVC) is increasingly promoted globally as a key source to bridge the financial gap for infrastructure investment. This article examines the LVC mechanisms adopted for the Grand Paris Express, one of Europe's largest ongoing urban transit projects, led by the state-owned Société des Grands Projets (SGP). It combines LVC literature with the sociology of policy instruments to analyse the selection and implementation of LVC tools, along with their outcomes on urban governance and spatial planning. Drawing on documentary analysis and interviews with representatives of the SGP and transport and planning institutions, the study highlights a shift in LVC from a tax-based to a development-based instrument, resulting in the launching of around eighty real estate projects on land acquired for the metro. This shift both reflects and shapes the broader reconfiguration of metropolitan governance and evolving models of infrastructure financing. It is bolstered by the SGP's transformation into an entrepreneurial actor, embracing new operational models that amplify the role of major private developers and embed market logics in public land development. While the ongoing projects—shaped by local trade-offs and marked by heterogeneity—support transit-oriented development and housing production near stations, the design of the development-based instrument undermines the provision of affordable housing. Thus, the paper draws attention to the inherent biases of the LVC instruments and to the potential for adverse socio-spatial outcomes, calling for further research on the interconnections between infrastructure financing, LVC policy instrumentation and urban planning.



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1749 - Tracing The Urbanisation Of A Capital City Ankara Through The Literary Books Of The Early Times Of The Turkish Republic

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The idea of using novels to understand a city is a relatively new approach, and novels have primarily been of interest to geographers. The first studies on the links between geography and literature were conducted in the US and the UK. All of these early studies, undertaken in the 1970s and 1980s, questioned what literature could contribute to geography and discussed the importance of space in understanding human phenomena. Since then, several studies have focused on representations of urban space in literary works in order to obtain elements for analysing the production of space. In this paper, I propose to explore this idea through the production of a capital city, Ankara, which was the site of the founding of the Turkish Republic in the early 20th century. The idea is to reconstruct the imaginary of the capital through the novels of the time and to understand the symbolic meaning of the places and ideals that guided political discussions and decisions at the time. As a result, the novels written at the beginning of the Republic are valuable sources for understanding the political and sociological reality of the time, as well as certain important events that took place in the entourage of M. K. Atatürk. As Kaynar (2012) notes, for example, although the mention 'fictional story' always appear on the first page of these novels, they are 'genuine biographical manuscripts' (p. 390). Admittedly, while the characters in the story are fictional, some of the events recounted, as well as the spatial configuration described, are very real and provide valuable information about the organisation of the city and its topography. We will also examine the role of literary figures in the dissemination of political models.



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1858 - From Tourist Town To Second Home Town How Extended Urbanisation And Persistent Housing Narratives Explain Jiaoxi Township's Transformation

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This study interrogates the perception of 'no problem' among stakeholders in holiday home development in a tourist town in Taiwan. Jiaoxi Township is famous for its hot spring resources, which have been exploited since the Japanese occupation. After the construction of the Snow Mountain tunnel, connecting the Yilan Plain with Taiwan's capital, Taipei City, in 2006, the construction of holiday hot spring apartments has skyrocketed. This paper situates this phenomenon within the context of Taiwan's commodified housing market and dominant housing narrative, which emphasises ownership and exchange value. Stakeholder interviews and document analysis guided this qualitative inquiry. Ultimately, the study demonstrates that Jiaoxi has become an extension of urbanisation for wealth accumulation by middle- to upper-class Taipei citizens. Hot spring water has become a privatised asset accessible through real estate investment, while the limited development area within the hot spring zone safeguards investment value. Supported by regulations and practices that do not challenge the narrative of commodified housing, the negative implications for Jiaoxi's socio-spatial configuration, including phenomenological displacement, and its charm as a tourist town are ignored by developers and the government in support of continued investment. This study highlights how planetary urbanisation, driven by capitalist accumulation strategies in combination with a persistent narrative of housing as an investment object, results in the inclusion of the periphery by expanding investment options, while increasing regional wealth disparities.



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1871 - From Dualistic Space To Networked Systems Grid Based Evidence On Urban–rural Linkages And The Transformation Of China’s Urban System

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For a long time, spatial governance and empirical research in China have been structured around a rigid urban–rural dichotomy. As China enters the middle to late stage of urbanization, this binary framework increasingly fails to capture the evolving nature of population interactions between cities and rural areas. Urban–rural relations are no longer dominated only by long-term migration and permanent settlement, but are increasingly shaped by frequent, short-distance, and short-duration daily population movements that form dense and dynamic connections. Using high-resolution daily mobility big data at the kilometer-grid scale, this study examines the spatial structure of urban–rural linkages in China from a network proximity perspective. By constructing population flow networks that transcend administrative boundaries, we identify the intensity and spatial heterogeneity of everyday interactions between urban and rural spaces. The results reveal pronounced regional differentiation, with highly integrated urban–rural networks concentrated around major metropolitan regions and urban agglomerations, while more fragmented and asymmetric linkages persist in peripheral areas. These findings indicate that China’s urban system is undergoing a fundamental transformation in which the drivers of spatial organization are shifting from structural migration to networked daily mobility. This study contributes to a better understanding of how changing population dynamics are reshaping urban–rural relations and provides new empirical evidence for rethinking urban systems in the context of late-stage urbanization.



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1920 - The Urban Expansion Form Of African Cities Spatial Heterogeneity And City Size Effects

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Background:

Africa is experiencing one of the fastest rates of urbanisation globally, creating significant pressures on housing, transport and infrastructure, further compounded by globalisation, climate change and poverty (1). The population of Africa is predicted to reach 1.4 billion by 2050, with 80% living in urban areas (3). While urbanisation is associated with economic growth and can drive societal benefits, it can also intensify inequalities in accessibility and environmental degradation (2), particularly when densities are low or development expands disproportionately relative to population. Understanding the spatial patterns of urban expansion and their relationship to population agglomeration across African cities is important for improving future living conditions and sustainability (4). This study aims to quantify current urban expansion patterns across African cities using indices of density and land fragmentation, and to examine geographic variations and variations along population size.

Materials and methods:

The analysis uses gridded population datasets, land cover data and functional urban area delineations. Net residential density is calculated as the ratio of population to residential developed area. Fragmentation is calculated in two ways: the perimeter-area ratio, defined as the urban footprint perimeter divided by the square root of its area; and by the openness index (5) that measures the percentage of open space within a 1km² neighbourhood surrounding each residential cell. These metrics are aggregated at the functional urban area level to enable comparisons of urban expansion patterns between cities, regions and city size classes.

Results:

With these metrics we identify geographic variations in densities and fragmentation and in their relationship with city size. We particularly seek to identify continental gradients and broad regional effects, such as differentiating Western or Southern Africa. We also explore the impact of city location - such as coastal (or ports) or mountainous settings.

Conclusion:

This study provides a systematic framework for assessing urban expansion across African cities using harmonised metrics of density and land fragmentation using most recent data and an unmatched sample of cities (number of cities and range of sizes). Our results offer new insights into the geographic variability of urban expansion patterns and the ways in which population agglomeration shapes built form outcomes.



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1941 - Heterogeneity Of Urban Shrinkage Using Principal Component Analysis And Cluster Analysis To Develop A Typology Of Urban Areas In Latvia

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Background

Urban shrinkage has become a major research topic in Europe since the early 21st century, driven by demographic ageing, low fertility, and internal migration toward economically stronger regions. While extensive literature examines causes, consequences, and policy responses, research has largely focused on large cities. Smaller towns and the influence of national and regional contexts on local shrinkage dynamics remain insufficiently explored. This gap is particularly evident in post-socialist countries, where demographic decline coincides with economic restructuring. Latvia, which has experienced profound demographic and socioeconomic change since the post-socialist transition, provides a relevant context for examining spatially differentiated urban shrinkage patterns.

Materials and methods

The study analyses urban shrinkage across Latvian urban areas using demographic, economic, and social indicators reflecting population change, labour market conditions, and urban functions. Principal Component Analysis (PCA) was applied to identify key dimensions underlying shrinkage processes and to reduce data complexity. Based on the extracted components, cluster analysis was used to group urban areas with similar characteristics, enabling the development of a typology of urban shrinkage.

Results

The results reveal pronounced spatial heterogeneity in urban shrinkage across Latvia. PCA identifies multiple dimensions associated with demographic decline and economic restructuring. Cluster analysis distinguishes several groups of urban areas with differing shrinkage intensities and trajectories, ranging from severe multidimensional decline to more moderate or selective forms. These patterns highlight uneven urban development within the Latvian urban system.

Conclusions

Urban shrinkage in Latvia is a differentiated and multidimensional process shaped by demographic and economic factors. The proposed typology underscores the need for context-sensitive urban and regional policies and provides a foundation for future comparative research on shrinking urban areas in Europe.



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2365 - From Build–sell To Reits Rearticulating Residential Development Pathways In Istanbul

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Istanbul's real estate sector offers a critical case for understanding how global financial instruments intersect with long-standing construction-based development of the country. As one of the key instruments in the financialization of real estate, Real Estate Investment Trusts (REITs) are globally understood as financial vehicles designed to manage income-producing real estate assets for the investors. This study examines the Turkish case and argues that; residential Turkish REITs (T-REITs) operate in a markedly different way with the state occupying a central position. Rather than functioning as rent-oriented asset management tools, residential REITs in Turkey have been mobilized as tax-advantaged financing mechanisms for large-scale residential projects.

The study, situated in urban political economy and financialization of urban production literature, argues that the T-REITs represent a historical rearticulation of a *longue durée* construction-based accumulation logic of the country, shaping through *sui-generis* institutional arrangements, regulatory frameworks, and development practices evolving through the legacies of the build–sell model. Since the 1950s, Turkey's build–sell model has relied on pre-financing, fragmented land ownership, and development-led value extraction by small- and medium-scale contractors. These core mechanisms have not disappeared with the introduction of REITs; instead, they have been institutionally reorganized and scaled up through REIT structures, enabling large residential projects under new regulatory and fiscal arrangements.

Methodologically, the study employs financial, spatial, and historical analysis. It examines the asset composition and development strategies of major T-REITs, maps their projects across Istanbul, and situates these practices within the longer trajectory of Turkey's construction-led accumulation regime. The findings show that Turkish case demonstrates a distinctive path-dependent way in which T-REITs function as development-centred instruments that consolidate land access, mobilize finance under constrained credit conditions of the country, and reproduce construction-led modes of capital accumulation.



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2728 - Climate Adaptation For Primary Schools In Mexico City Lessons Learned And Best Practices

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Urban schools are increasingly exposed to climate-related hazards, particularly flooding and extreme heat, which directly affect children's health, learning conditions, and educational continuity. This paper is grounded in an ongoing research project on urban resilience that examines how public primary schools can strengthen their adaptive capacity in the face of climate change. Focusing on Mexico City, the study analyzes school-level responses to recurrent floods and intensifying heatwaves, situating them within broader debates on resilience as a socio-ecological, institutional, and learning-oriented process rather than a purely technical outcome.

The research combines a comparative review of international experiences in school-based climate adaptation—drawing on cases from Europe, Asia, and Latin America—with empirical analysis of the socio-environmental and governance conditions shaping public schools in Mexico City. International lessons related to climate-responsive design, green and blue infrastructure, heat mitigation strategies, risk governance, and community participation are critically assessed in terms of their transferability to highly dense, unequal, and resource-constrained urban contexts.

By linking global best practices with local realities, the paper highlights key tensions between standardized adaptation models and context-specific resilience pathways. It argues that primary schools can function as strategic nodes of urban resilience, not only by reducing physical exposure to climate hazards but also by fostering adaptive learning, risk awareness, and the co-production of knowledge among students, educators, families, and local authorities. The findings contribute to resilience research by emphasizing schools as critical infrastructures for climate adaptation in megacities of the Global South and by offering policy-relevant insights for integrating educational spaces into urban resilience and adaptation strategies.



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3243 - Decentralization Of Public Services A Model For Poland

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The aim of this presentation is to present a model for the decentralization of public services using Poland as an example. The research was carried out using the following method:

- a) analysis of the distribution of institutions performing national and regional public decision-making and control functions, as well as local administrative bodies;
- b) analysis of the potential for locating and strengthening decision-making and control functions in particular centres;
- c) review of international experience.

According to the proposed concept, deglomeration in Poland should serve three main purposes:
to avoid excessive concentration of public decision-making and control functions in the capital city (Warsaw);

to strengthen the polycentric structure of the settlement system by supporting urban centres that are important for the development of the country and its individual regions;

to maintain the efficiency, competence, and managerial capacity of public administration, and thus avoid the risk of excessive dispersal of public institutions.

Results obtained

As a result of the analysis, data were collected and examined on the location of 159 central administration institutions (including 135 in Warsaw), 648 branches and local offices of national institutions (including 36 in Warsaw), and 346 local administrative institutions (including 23 in Warsaw). On the basis of an indicator-based analysis, the potential for locating and strengthening decision-making and control functions in particular metropolitan, regional, and subregional centres was then assessed. A literature review was also carried out on deglomeration experiences in the United States, Germany, France, the United Kingdom, and the Netherlands.

Model development and discussion of results

On the basis of the results obtained, a model of deglomeration was developed according to the following assumptions:

limiting the transfer of institutions already located in Warsaw to new locations in other cities;
new national institutions with decision-making and control functions should not be located in the capital city;

strengthening decision-making and control functions in the public sector through the creation of new institutions, regional branches, and local offices, based on human capital and the existing institutional infrastructure.

In the final part of the presentation, an example will be given of how this model was applied in the process of identifying the optimal location for the Polish branch of the European Space Agency in 2026.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Climate Change



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1138 - Burning Down The House And Gentrifying The Neighborhood Justice And The Los Angeles Wildfires January 2025 And Beyond

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Background/hypothesis

In January 2025 wildfires devastated parts of Los Angeles. The largely African-American community of Altadena was devastated by the Eaton fire. The wildfires burned in winter, as the impacts of climate change overlapped with the Santa Ana winds. Justice is an important aspect of the wildfires and anthropogenic climate change. This includes the climate justice as to why these fires were more likely due to anthropogenic climate change, the justice of preparation and resource allocation during the wildfires, and the justice of living and rebuilding after the wildfires. It is hypothesized that there are differences between the notions of justice prioritized by climate activists, agenda-setting newspapers, African-American media and Black community leaders.

Materials and methods

Newspaper articles, including in African-American media, were reviewed to analyse how the wildfires were framed and presented at the time of the wildfires, afterwards and on the first anniversary of this event.

Results

In 2025, climate justice and environmental justice was not prominent in African-American media. Justice concerns focused on the distribution of resources, and “same justice” rather than “half-justice” by comparing Altadena with what was happening in richer Los Angeles communities such as Malibu. Gentrification of a historical Black area that pre-dates the American Civil War was a major concern as developers bought property cheaply from poorer African-American residents. The presentation will review the reporting of the wildfires and their aftermath on the first anniversary of this tragic event.

Conclusions

Media framing of justice potentially misses an opportunity to expand knowledge of climate change, particularly for vulnerable groups such as African-American urban residents who are likely to be multiply exposed to the cumulative impacts of anthropogenic climate change.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Democratising Urban Governance for Just Transitions



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1249 - Urban Empathy A Spatial Perspective

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This paper discusses the possibilities of spatial empathy in cities by addressing recent changes in urban transformation and governance. Cities function as centers of specialized services and decision-making. Urban spaces promote sharing, matching labor with jobs, and facilitating learning to stimulate innovation. Cities lead investment in innovation and technology, blurring boundaries between work and life. Innovation concentrates in large cities, exacerbating disparities with smaller cities and rural areas. However, this differs from traditional urbanization processes and introduces challenges like social polarization and privatization. Drawing from Elinor Ostrom's work, effective governance of shared resources relies on trust, cultural norms, and institutional mechanisms. It involves managing various resources sustainably and acknowledges the complexity of human-ecosystem interactions. Empathetic cities prioritize citizen participation, cooperation, and inclusion, emphasizing redistribution, recognition, and representation. They promote diverse, inclusive, and sustainable urban spaces through systemic thinking, human-centric approaches, and integrated governance. Empathy in cities involves understanding and sharing others' experiences, fostering social cohesion and cultural empathy. Spatial empathy, influenced by place atmospheres, enhances individuals' connection to urban spaces. Cultural empathy strengthens community bonds and enhances local identity. All in all, efforts should focus on identity, diversity, continuity, sociability, proximity, flexibility, and integration. Overcoming compressed modernization and emphasizing citizen-centered governance are crucial for creating inclusive and vibrant urban environments and for fostering empathy and community resilience.



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1621 - Estimates Of Statistics On Just Transitions At The Subnational Level A Case Study Of Eu Countries

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High-carbon-intensity industries have a tendency to be geographically concentrated. From the perspective of achieving just transitions, the decarbonisation of these industries, which are affected by national low-carbon policies, while preserving existing employment within them, represents a significant social challenge for the regions in which these industries are located. While national-level statistics on low-carbon industries (i.e. green establishments) and low-carbon employment (i.e. green jobs) are being developed, however, sub-national-level statistics to measure just transitions at a regional level that are significantly affected by national climate change counter-measures remain insufficient. In view of the aforementioned, the objective of this study was to estimate sub-national statistics on just transitions. The present study concentrated on EU countries for which national-level just transition statistics have been established. It is notable that some EU countries also possess subnational-level just transitions statistics. The research methodology comprised the expansion of subnational-level statistics from countries in which they exist to other EU member states lacking such data. The results indicated the presence of regional disparities in the concentration of low-carbon employment and high-carbon intensity industry employment, also referred to as 'brown jobs'. This finding suggests the necessity for comprehensive environmental governance in regions with high-carbon-intensity industries, encompassing not only the employers and employees of these industries but also the low-carbon industries and national and local governments.



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1703 - Democratising Mobility Planning In Irish Towns

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The need to transition toward environmentally and socially just urban futures is an urgent one, requiring fundamental paradigm shifts in how urban spaces are designed, inhabited, and governed. Yet, in many countries, politicians, policy-makers and planners continue to rely on traditional top-down governance models. These top-down approaches often overlook the place-specific and hyper-complex ways that societal challenges manifest in towns and cities, thus risking alienation of citizens and businesses. In recent years, there is an increasing scholarly and political interest in democratising urban governance to bridge the gap between national or regional policy goals and local realities and action.

This paper contributes to these debates by presenting findings from the CONUNDRUM project, funded by Research Ireland, which focuses on democratising mobility and transport planning in Irish towns. Historically, transport planning in Ireland has been characterised by these top-down approaches, with local governments often relying on external consultants to design and implement plans. By failing to account for the nuance of local lived experience, plans are frequently implemented that are controversial, ineffective, poorly understood by residents and fail to encourage behavioural change. To address this challenge, we utilise co-creation methodologies grounded in participatory action research (PAR). Working alongside more than 400 diverse stakeholders—including local government, residents, service providers, and business owners—we facilitated the development of community-led mobility strategies in selected case study towns. To date, several co-created actions have been successfully implemented in our case study towns, proving that co-creation approaches can enable effective democratic urban planning. Our findings demonstrate that when stakeholders are positioned as active co-designers rather than passive recipients of policy, the resulting strategies offer more appropriate, empowering and potentially impactful pathways for achieving urban just transitions.



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2058 - Just Transitions From The Street Climate Change Work And Democratic Deficits In Urban India

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As climate change intensifies, Indian cities are witnessing growing inequalities in exposure to heat, flooding, pollution, and infrastructural precarity. These impacts are most acutely experienced by those whose work is embedded in streets and public spaces, yet whose needs remain marginal to dominant planning and climate governance frameworks. Drawing on a collaborative project on just transitions in three Indian metropolitan cities (Delhi, Bengaluru, and Kolkata), this paper examines how street-based workers experience climate change in their everyday lives, the strategies they adopt to cope with climatic stress, and their encounters with urban governance systems that offer little support for adaptation.

Based on qualitative surveys conducted with vendors, transport workers and delivery workers in three cities, the paper documents how climate stressors such as extreme heat, erratic rainfall, and flooding directly shape working hours, income stability, health, mobility, and household reproduction. Workers describe a range of individual and collective adaptation practices, such as adjusting work timings, absorbing rising health and infrastructure costs, and relying on informal networks, while shouldering the risks and costs of climate change largely on their own. Across cities and occupations, the state figures primarily through absence, uneven enforcement, and punitive interactions rather than through protective or enabling support.

The paper argues that these experiences reveal a democratic deficit at the heart of urban climate transitions. While street-based workers are among the most exposed to climate impacts, they remain marginal to decision-making processes that shape urban futures. Advancing just transitions, therefore, requires rethinking urban governance from the standpoint of lived experience: recognising street-based workers as political actors, creating space for collective bargaining, and embedding participatory mechanisms that integrate those most affected by climate change into shaping adaptation pathways. By centring worker experiences and needs, the paper contributes to debates on democratising urban governance and building socially just climate transitions in the Global South.



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2197 - Assessing Inclusivity And Social Equity In Civic Initiatives The Role Of Communities In Urban Decision Making

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The role of local communities in shaping urban decision-making remains uneven and often under-examined, even as urban transformation processes increasingly rely on spatial data and technical diagnostics to define priorities and guide interventions. While these approaches enhance the capacity to analyze territories and design targeted actions, community participation continues to be marginalized within many planning and governance practices.

This research focuses on the importance of civic initiative groups as mediators between institutional planning structures and everyday urban experience. It explores how community-based initiatives contribute to more inclusive and socially equitable urban decision-making by representing diverse social groups, facilitating participation, and advocating for territorially fair outcomes, with particular attention to initiatives related to urban green spaces.

The study proposes a conceptual framework for assessing inclusivity based on three analytical dimensions: (i) representativeness of participating actors, (ii) accessibility of engagement and decision-making processes, and (iii) the effectiveness of civic initiative groups in influencing urban decisions and translating community needs into concrete actions.

Grounded in geographical perspectives on urban governance and social justice, the research adopts an exploratory approach based primarily on document analysis and the review of publicly available materials produced by civic initiative groups and local institutions. Where relevant, a basic inventory of existing community groups is used to identify the range of civic initiatives involved in green space-related projects. The study examines how these groups define their objectives, mobilize participation and position themselves within urban decision-making processes in order to assess their potential contribution to more inclusive and socially responsive urban governance.

By foregrounding the role of communities, this research seeks to contribute to more participatory, transparent and socially sustainable approaches to urban decision-making.



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**C24.45-Urban Commission: (Re-)Thinking Cities
and the Urban: From the Global to the Local =>
Geographies of Studentification: Investigating Spatial
Transformation, Social Justice and Future Possibilities**



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1325 - Informality & Studentification In South Asia A Case Study Of Delhi

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Studentification has been widely studied and theorised in the context of the Global North. However, comparatively little attention has been given to how studentification is unfolding in the cities of South Asian countries, especially in India. This study, drawing on the experiences of studentification in Delhi's context, aims to understand the patterns this process might take in the South Asian context. Delhi, the Capital city of India, hosts thousands of students from various backgrounds, with the presence of diverse educational institutions. Due to the limited availability of in-house accommodation facilities provided by institutions, the housing market in areas adjacent to such institutions has developed along with allied services which cater to the interests of students. Unlike the purpose-built student accommodation models prevalent in the Global North, student housing in Delhi is characterised by varying degrees of informality. Informality emerges as a defining feature of the student housing market, influencing rental arrangements, governance structures, and the everyday experiences of students. Based on an ethnographic study conducted in selected neighbourhoods of Delhi where student populations reside, the study aims to identify patterns in the informal structure that shape the studentification trends in these urban spaces. There is a need for a nuanced understanding of the heterogeneous nature of student neighbourhoods to unravel the complex ways in which they interact with the larger trends of gentrification and urbanisation. The study proposes a classification of student neighbourhoods into primary, secondary, and tertiary based on various characteristics, such as proximity to Higher Education Institutions, availability of physical and social infrastructure, quality of housing, and the experiences students have with other inhabitants. This study argues that understanding studentification in the South Asian context requires close attention to these informal housing practices and to the uneven urban conditions within which student life is negotiated.



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1988 - A Comparative Analysis Of Studentification In Tokyo And Kyoto Japan Since The 2000s

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Abstract:

Background: Studentification has also attracted scholarly attention within Japanese urban geography (Nakazawa 2017). In Japan, where the relocation of universities from metropolitan suburbs to city centres has been promoted, elucidating the impacts of these relocations on urban spaces has become an important research agenda. While previous studies have advanced analyses of restructuring in suburban student residential areas following university withdrawals (Kuribayashi 2021), research examining transformations in city centres receiving relocated universities remains underdeveloped.

Purpose and Methods:

This study examines the relationship between university location and relocation, land prices, and the transformation of student residential areas, focusing on Tokyo's 23 wards and Kyoto City. Using GIS, the analysis employs an outlier analysis based on student population ratios and an interpolation analysis of land prices. A comparative analysis is then conducted between Tokyo's 23 wards and Kyoto City.

Results and Discussion:

The results reveal both similarities and differences in the transformation of student residential areas. Since the 2000s, student populations have increased in both Tokyo and Kyoto. In addition, both cities show a decline in High-High clusters and an increase in Low-Low clusters, based on student population ratios, within high land-value zones. However, the restructuring of student residential areas is more advanced in Tokyo than in Kyoto. In Tokyo, the spatial pattern of student residences has shifted more clearly from a sectoral structure toward a concentric structure. This disparity may derive not only from the location of the university but also from differences in the socio-economic backgrounds of the students.

Kuribayashi, A. 2021. Development and housing market dynamics of student apartments in the suburbs of metropolitan areas in terms of the establishment and withdrawal of universities: Case study of Kyotanabe, Kyoto Prefecture. *Geographical Review of Japan Series A*, 94: 450–467. □ in Japanese □ Nakazawa, T. 2017. What is studentification? : A critical review and imprecations for researches in Japan. *Urban Geography of Japan*, 12: 33-49. □ in Japanese □



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1996 - Youth Mobility As A Driver Of Cohesion And Intergenerational Fairness

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This paper addresses the methodological challenges involved in studying youth mobility and its impact for territorial cohesion and intergenerational equity in peripheral regions. Can youth mobility act as a driver of territorial cohesion and intergenerational equity? The growing polarization of large metropolitan areas has been accompanied by the persistent decline of peripheral regions. These territories, weakened in their economic base, have also been deprived of their most valuable resource—qualified young people—who continue to migrate towards major urban centres. As a result, demographic ageing has been more accelerated in remote regions, where intergenerational inequalities are also becoming more pronounced. Counter-flows of young people, however, do exist, particularly through higher education mobility and students' migration although largely limited to the duration of studies. After graduation, displaced students tend to return to or move to metropolitan regions due to labour market dynamics. Previous research focused on Portugal, using higher education access databases over a time series of approximately 25 years, concluded that educational policies have limited capacity to influence voluntary student mobility or to retain graduates in the most disadvantaged territories. Initiatives aimed at attracting and settling young people in peripheral regions have therefore not achieved the expected outcomes. Building upon earlier work, the present study is based on complementary qualitative methodologies, including interviews and questionnaires conducted in higher education institutions located in Portuguese peripheral regions. The paper is framed within ongoing European projects assessing intergenerational equity in relation to youth qualification, employment, and migration, and contributes to the development of prospective scenarios designed to inform future cohesion and fairness policies. The results highlight structural constraints of peripheral territories and call for integrated policy instruments capable of transforming temporary youth mobility into long-term opportunities for regional cohesion and intergenerational justice.



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2542 - Home From Home Or Village Of The Damned Female Student Experiences Of Sanitation In Off Campus Accommodation In Rural Kwadlangezwa South Africa

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Background

Studentification in the Global South has primarily been examined through economic and spatial lenses, with little attention to the everyday experiences of female students living in informal, off-campus housing. In the context of rural and township universities throughout South Africa, the nature of student accommodation is largely influenced by precarious arrangements found in makeshift structures within the rural homesteads and standalone structures built by the locals. Despite recognising the infrastructural shortcomings of these residences, the current academic discourse tends to overlook critical gendered aspects of sanitation. Showers and toilets are sites where problems of safety, power, vulnerability, and dignity intersect, especially for female students. This study investigated the lived experiences of female students who live off campus in KwaDlangezwa.

Materials and methods

The study adopted a qualitative approach to conduct 19 semi-structured interviews with female students, and these were analysed thematically to highlight how sanitation facilities shaped their lived experiences.

Results

The results show interconnected areas of gendered precarity: ongoing problems with hygiene; threats to privacy and physical safety; challenges with menstrual hygiene; and power imbalances that come with informal landlord-tenant relationships. The research contends that sanitation surpasses mere formality, evolving into a gendered social infrastructure that influences the experiences of female students.

Conclusion

The study advocates for a fundamental transformation in student housing policy, transitioning from gender-neutral accommodation norms to gender-sensitive frameworks that acknowledge sanitation as a human right and a prerequisite for justice. It concludes by recommending for the South African government to regulate both formal and informal student accommodation to safeguard female students.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Global Housing Crisis and Local Responses: Cities at the Global-Local Crossroads



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2173 - Towards Rescaling Housing Governance In Spain An Emergent Local Housing Agenda Amidst An Uneven Paradigm Shift

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Background/Hypothesis

Housing crisis has reopened European debate on post-neoliberal transitions. Spain's 2023 Housing Law, the first state-level legislation in the democratic period, epitomizes this shift by restoring rent regulation and expanding public intervention. However, implementation reveals territorial unevenness driven by institutional fragmentation and political polarization. This research examines whether an emergent local housing agenda materializes within this transformation. We hypothesize that rescaling processes operate unevenly, shaped by variegated political and regulatory contexts. The study analyzes implementation across Spanish regions, particularly those adopting rent control.

Materials and Methods

The research employs multi-scalar policy analysis combining specialized literature, official statistics, and documents across three levels: (1) state instruments, examining new frameworks; (2) regional adaptations, analyzing how autonomous communities adjusted their mechanisms to the new state context; (3) local policy implementation, focusing particularly on territories where rent regulation is being fully deployed. Data includes legislative texts, administrative records, planning documents, and fiscal ordinances.

Results

Preliminary findings reveal stark implementation divide: minority of regions adopt rent control while majority block reform, reflecting political polarization. Within implementing regions, local government roles vary significantly, yet common patterns emerge. Evidence demonstrates an emergent local housing agenda characterized by late defensive regulatory responses to short-term rental explosion, uneven rent control implementation, incipient planning shifts prioritizing vacant housing mobilization and social housing diversification, promotion of third-sector partnerships, and expanding municipal housing capacities. Persistent obstacles include limited municipal scales, obsolete planning, data deficits, fragile participatory governance, and insufficient multi-level coordination.

Conclusions

Evidence demonstrates ongoing rescaling of housing governance in Spain, though profoundly uneven. Political polarization drives territorial fragmentation and asymmetric local capacity development. An emergent local housing agenda materializes where reform advances, yet structural constraints limit transformation. Findings address the state bias in housing research, illuminating how regional frameworks mediate national policy and local action in spatially differentiated post-neoliberal transitions.



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2296 - Unaffordable Housing Growing Vulnerability The Housing Crisis In Small And Medium Sized Urban Areas

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Housing is a fundamental right and a pillar of social stability, but access to it has become increasingly limited due to constantly rising prices, property speculation and the lack of effective public policies. These factors generate residential exclusion and increase the vulnerability of many families, particularly affecting small and medium-sized urban environments, where the impacts of global trends require adaptation to specific local realities.

This study focuses on analysing how rising housing prices affect social vulnerability in intermediate cities, taking Galicia as a representative case. To this end, a comparative analysis of market statistics, public policies and socio-economic studies was carried out. The percentage of family income spent on housing was examined, as well as how the lack of access to decent housing influences vulnerability, comparing local trends with global data to better understand the relationship between global phenomena and local effects.

The results show that in many cities, families spend more than 40% of their income on housing costs, demonstrating a considerable economic effort. Current public policies are insufficient to guarantee access to affordable housing, which intensifies residential exclusion. It is confirmed that decent housing is a central element in reducing social vulnerability, while speculation and high prices make access even more difficult, even in medium-sized urban areas.

It is concluded that the housing crisis is the result of the interaction between global and local factors, directly affecting the lives of the population. Addressing it requires strengthening local policies, promoting affordable housing and protecting families from speculation, adapting global solutions to the specific needs of each urban context.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Globalisation vs Localisation



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2122 - When Metrics Meet Citizens In Local And Regional Contexts A Multilevel Analysis On European Cities

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Urban sustainability has become the dominant framework for addressing contemporary urban challenges. However, citizen perceptions and priorities vary significantly across contexts, demanding place-sensitive strategies. While cities invest in measurable improvements in infrastructure, environmental quality, economic indicators, residents' perceptions may diverge from these metrics, particularly across diverse institutional and cultural contexts. This study assesses the explanatory power of objective sustainability indicators for citizen satisfaction, identifying which urban dimensions (environmental, economic, or social) most strongly shape residents' perceptions of their cities. We employ a cross-sectional analysis across 85 European cities, analyzing perception-reality gaps and their geographical patterns. Using satisfaction metrics and comprehensive official datasets, we integrate a multi-method approach that ultimately covers a multilevel hierarchical fixed-effects model to account for regional-level variations. Findings show that objective indicators explain over 60% of perceived urban sustainability, with economic indicators emerging as the strongest and most consistent determinants of urban satisfaction. As prosperity alone fails to completely ensure this correlation, we find the continuously rising climate stress to demonstrate negative associations with satisfaction. In terms of perception gaps, significant differences within the East-West dichotomy arise. National context needs to be taken into account, as legislation, mentalities and common backgrounds have a strong influence on numbers, despite not explicitly present. Cities in countries with weak governance exhibit lower satisfaction despite comparable objective conditions, as residents perceive systemic failures transcending local characteristics. Our findings demonstrate that effective urban sustainability policy requires addressing both objective conditions and contextual factors that shape citizen perceptions.



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2241 - Taking Action Based On Need The Main Environmental Challenges Highlighted In Romania's Planning Documents

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The world population is mainly concentrated in urban areas, making cities the most relevant sources for environmental change and degradation on a global scale. Nevertheless, urban environments are vulnerable to further degradation due to overcrowding. It became a real challenge for scientists, planners and policymakers to design or transform urban neighbourhoods into liveable ones. The residential function in cities is under constant pressure as housing demands increased. Hence, the pace of developing new residential neighbourhoods in cities has increased in major cities. The question rising from this reality is whether the urban residential areas became sustainable and resilient to the actual environmental challenges. To design sustainable and resilient residential urban areas, environmental challenges must be properly identified. This study aimed at extracting how environmental challenges are identified and prioritized in Romanian local and regional planning documents. The results show that in all counties environmental pressure were mainly described at regional scale while specific challenges were rarely addressed. Also, the appointed measures and action were oriented mainly on water management and public health and well-being issues, with focus on developing the planning and governance capacity. On the other hand, at the local level, planning documents focus on aspects related to green space management, both in terms of the objectives they set and future actions. Conversely, they place less emphasis on water management, air quality, or participatory planning. Based on the information extracted and processed from the analysed documents national maps were generated emphasizing the specific environmental challenges identified by local and regional authorities. This type of data will help assessing if urban residential areas are sustainable given the local environmental context and whether they are resilient in front of these challenges.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Innovative Approaches to Spatial and Urban Planning in Times of Transformation: Between Tradition and Modernity



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1603 - Modelling Susceptibility To Illegal Land Occupation In Cape Town South Africa A Random Forest Approach

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Illegal land occupation is a persistent challenge in South African cities, shaping urban form, exacerbating spatial inequality, and complicating efforts to deliver secure and inclusive housing. Despite extensive descriptive studies on its causes and socio-spatial patterns, there is a significant gap in predictive modelling of where future occupations are most likely to occur. This paper addresses this gap by developing a spatial susceptibility model for illegal land occupation in the Cape Town Metropolitan Area using a Random Forest (RF) regression framework.

We compiled a dataset of 1 070 spatial point observations representing known instances of illegal occupation and pseudo-absence locations, stratified across land cover, proximity to existing informal settlements, socio-economic gradients, and infrastructural predictors. Seventy percent of the observations were used to train the RF model, with the remaining 30% reserved for validation. The model exhibited robust predictive performance ($R^2 \approx 0.81$), demonstrating its capacity to explain most variation in observed susceptibility. Model results indicate that areas immediately adjacent to existing informal settlement footprints, along with peri-urban fringe and industrially zoned land, exhibit elevated susceptibility to future illegal occupation. This research contributes a geospatial AI approach to urban land management by integrating machine learning with spatially explicit socio-environmental predictors to derive high-resolution susceptibility surfaces.

The resultant susceptibility map can assist urban planners and policymakers in prioritising proactive interventions, such as targeted service delivery, tenure regularisation pathways, and spatial planning adjustments, in areas identified as high-risk. Future work should explore the integration of temporal dynamics and deeper socio-institutional variables to further enhance model interpretability and policy relevance.



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1905 - Spatial Patterns Of Compact City Development Living Convenience And Residential Satisfaction In Toyama City Japan

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Background/Hypothesis

Compact city policies address population decline and environmental challenges globally. Toyama City, Japan, has pioneered LRT-oriented development since 2006. While evaluations show achievements in ridership and population redistribution, the spatial heterogeneity of outcomes and their relationship with residents' experiences remain inadequately examined. This study investigates spatial patterns of compact city outcomes in Toyama: How have compactness and accessibility changed across urban zones? How do residents in different areas perceive convenience, environmental quality, and satisfaction? What spatial variations reveal about policy trade-offs?

Materials and Methods

The research integrates GIS-based spatial analysis with questionnaire surveys. Using 1km mesh data from 2005 to 2025, we apply spatial techniques including buffer analysis around LRT stations, kernel density estimation for population and facility distributions, and spatial autocorrelation analysis to examine clustering patterns. Temporal changes in population density, facility accessibility, and land use are analyzed across designated compact zones and surrounding areas. A questionnaire survey captures residents' assessments of living convenience, environmental quality, and residential satisfaction. Spatial analysis techniques identify geographic variations in both objective conditions and subjective evaluations.

Results

Preliminary findings reveal substantial population concentration in designated zones, yet this masks significant spatial variations. Spatial analysis reveals population concentration occurs unevenly across compact zones: inner-city areas show stronger growth than outer LRT corridors, suggesting distance-to-center effects persist despite transit improvements. LRT enhanced regional connectivity, but daily accessibility improvements vary considerably across areas. Persistent automobile dependency suggests infrastructure alone may not trigger behavioral shifts. Pilot surveys reveal diverse satisfaction patterns: residents' evaluations differ not only between compact and non-compact zones but also within compact zones, depending on local conditions.

Conclusions

These findings illuminate the spatial complexity of compact city outcomes, showing that policy effectiveness cannot be uniformly assessed. The study contributes to understanding how compact city strategies navigate trade-offs between environmental efficiency, fiscal sustainability, and livability—insights relevant for shrinking cities worldwide.

This achievement was supported by JST SPRING, Grant Number JPMJSP2124; The Statistical Information Institute for Consulting and Analysis (Sinfonica), Japan.



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2553 - Urban Planning And Gender Perspective In Spanish Urban Planning Legislation

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The need to incorporate, as a normative innovation, the gender perspective in land and urban planning has not been universally obvious for a long time. The inclusion of the gender perspective has implications, not always peaceful, for the legislative and regulatory acquis in the field of land and urban planning, and, in some cases, arouses misgivings, both technical and legal, as well as ideological.

In this paper we will try to present the latest regulatory and technical innovations that advocate the relevance of adopting this perspective when planning both the territory, in general, and the urban space, in particular. To this end, we will begin with some brief conceptual clarifications regarding what is considered territorial planning, urban planning and gender perspective.

We will then move on to the background and regulatory foundations that support the incorporation of the gender perspective in the latest land legislation in Spain, referring especially to the case of national legislation, and then focus on the land and urban planning legislation of the Autonomous Community of Extremadura, which has been a pioneer in this process. With respect to the latter, we will delve into the technical criteria that have been implemented to support territorial and urban planning that includes the gender dimension in its drafting process.

We will also analyse the controversy generated by the gender impact report and the consequences of the different legal interpretations that are taking place in the courts regarding whether or not it is mandatory.

Finally, we will try to synthesize our work in what, in our opinion, may be the most relevant conclusions that we can present at this time with respect to this subject matter



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2748 - Spatio Temporal Behavioral Geography Research And Planning Practices In Chinese Cities

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This paper outlines the developmental trajectory and contemporary trends in Chinese human geography, with a particular focus on its recent “behavioral turn.” The discipline has undergone several distinct phases: early development prior to 1949 influenced by Western regional descriptive approaches; a quantitative revolution stage after 1978, marked by socio-economic transformation and an emphasis on statistical analysis; and a new phase since 2010 characterized by a significant shift toward humanistic and behavioral geography. This latest transition is a necessary response to the Chinese-style modernization, which is driven by profound urbanization and a focus on high-quality and sustainable development.

Emerging spatio-temporal behavioral geography in China integrates theories such as behavioral geography, time geography, and activity-based analysis. Its key theoretical innovations are reflected in the study of four core interactions within human-environment systems: (1) subjective-objective interaction, combining observed behaviors with subjective perceptions; (2) long- and short-term behavioral interaction, linking life-course events with daily activity patterns and health outcomes; (3) multi-agent interaction, scaling from the individual level to households, communities, and societal systems; and (4) physical-virtual activity interaction, examining the hybrid nature of online and offline spaces in daily life.

Empirically, this conceptual framework guides research on residential mobility, health behaviors, household decision-making, neighborhood social integration, and digital activity patterns. In planning practice, this research has driven innovation in three key areas: life space planning (optimizing the allocation of time and space to meet residents’ dynamic needs), life time planning (optimizing daily rhythms and time utilization), and spatio-temporal behavioral planning (guiding sustainable lifestyles and decision-making).

Looking ahead, Chinese spatio-temporal behavioral geography aims to address interdisciplinary, holistic, scientific, and socially oriented needs. Key tasks include consolidating a human-centered spatio-temporal behavioral research paradigm, developing mixed-methods approaches that integrate big data with in-depth qualitative analysis, and scaling up micro-level research findings to support urban governance, mobility management, and emergency planning.



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2778 - Advancing Time Geography For Urban Social Sustainability Perspectives And Methodological Frontiers

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The quest for people-centered urban development represents a shared global vision. This presentation explores how time-geography—with its foundational principles of space-time integration, the indivisibility of the individual, and its socio-ecological approach—provides a critical theoretical and methodological framework for addressing the common challenges inherent in this pursuit.

We will briefly chart the evolution of time-geography, emphasizing its unique capacity to abstract and interpret complex human activities in different societies across the world and over different stages of urban development. The core of our discussion will then demonstrate how this framework is applied to decipher the spatiotemporal complexity of urban life, using Chinese megacities Beijing, as a pivotal case study. We focus on how the analysis of household project and space-time activity systems under the background of social transformation and technological change reveals the micro-scale realities of wellbeing, equity, and access. Besides, we aim to reveal the emergence and resilience of pockets of local order both at home and within the community, which is crucial for sustainable community governance. Empirical case studies thereby offering a scientific basis for people-centred planning practices like the community life circle planning.

By situating this work within broader Asian urban challenges, we aim to spark theoretical dialogues and showcase how time-geography contributes to a more generalizable understanding of sustainable and adaptable urban futures.



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**C24.45-Urban Commission: (Re-)Thinking Cities
and the Urban: From the Global to the Local => Just
Transitions in Urban and Peri-Urban Food Systems:
Pathways Toward Equity and Sustainability**



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1923 - City Food Strategies As Mechanisms For Just Transitions Of Urban Food Systems Bridging Eu Policy With Urban Contexts.

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Addressing the unsustainability and inequality of our food system is a key challenge in advancing towards more Sustainable Cities and Communities [SDG11]. In the EU, GHG emissions from the bloc's food systems equate to roughly a third of total emissions. In the last decades there have been a series of important and promising policy interventions in relation to moving the EU's food systems towards more sustainable and equitable futures, which have recently stalled or even reversed. While the Farm to Fork Strategy [F2F] constitutes the most comprehensive and ambitious vision put forward by the European Commission for food systems under the EU Green Deal, significant uncertainty remains regarding the level of political commitment to its implementation and the concrete mechanisms through which local and territorial levels are expected to be supported. As has been well documented, bridging the gap between EU-level policy and local contexts is a considerable and persistent barrier, particularly in relation to politically charged issues that necessitate complex competencies and responsibilities across actors and scales, and whose position as a policy priority is unstable; such as food system transitions. The creation of urban sustainable food strategies offers potentially impactful avenues for bridging this gap and transmitting EU sustainable food policies across scales. Yet, in the context of uncertain and fluctuating political interest, it is unclear which actors, mechanisms or networks can support the realisation of this multi-scalar policy linkage.

Comparing Barcelona, Spain, and Dublin, Ireland, this paper examines the challenges of aligning urban sustainable food strategies with the F2F Strategy. While Barcelona is considered a leader in food sustainability, Dublin often lags behind other major European cities in this regard, offering a productive empirical juxtaposition. Through this comparative study, we explore the potential of European and international networks and actors to act as key instruments for enabling cities to link their urban sustainable food strategies to European-level policy. In doing so, these networks and actors may help cities to advance key European and national policy aims at city-level, such as those of the F2F strategy, thus supporting the transition to more socially and environmentally just urban futures.



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2217 - Infrastructuring Urban Food Commons In Just Food Transitions

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Urban and peri-urban (UPU) spaces are critical arenas for re-imagining food systems through justice in the face of deepening social and ecological crises shaped by profit-driven, commodified, socially and ecologically destructive forms of industrial capitalism. Besides consumption-related inequalities, just food transitions in UPU need a broader reconfiguration of everyday food practices, including collectively growing, cooking, and eating good food. Within this context, urban food commons are prefigurative spaces, for experimentation, and for reimagining food as collectively governed, socially embedded, an ecologically grounded. At the same time, such initiatives can face criticism for remaining small, exclusive, or isolated “islands” that are easily co-opted, marginalized, or ignored, unless they are woven into what Massimo De Angelis and Sergio Ruiz Cayuela have called socially reproductive “commons ecologies”. In this paper, we re-conceptualize urban food commoning practices through the critical lens of infrastructuring in order to examine three forms of infrastructuring- material, care, and affective- that we believe are necessary for creating socially reproductive commons ecologies for just urban food futures. Approaching urban food commoning practices as related, contested and situated, the research foregrounds the material arrangements, caring labors, and affective attachments that together create networked infrastructures of collective sustenance. Material infrastructuring describes the built environments and spatial configurations that facilitate food preparation, sharing, and circulation. Grounded in Sylvia Federici’s feminist approach to the commons that center collective forms of care in societal transformation, care infrastructuring makes visible the socially reproductive, physical, and affective labors involved in the maintenance of urban food commons. Drawing on what Giacomo Poderi describes as affective subjectivation, affective infrastructuring sheds light on the environments, emotions, attachments, and kinds of belonging that bind commoning collectives together and influence their ability to endure. To situate this infrastructural triad, we investigate how urban food commons can create socially reproductive commons ecologies for just food transitions using the case of community kitchens in Amsterdam.



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2688 - Bridging Institutions And Behavior In Household Food Waste Research A Multilevel Systematic Review

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Background: Household food waste has become an increasingly prominent challenge in global sustainability debates, with far-reaching implications for climate mitigation, resource efficiency, and food-system resilience. Despite the rapid growth of household food-waste research, the literature is highly fragmented across conceptual levels. Behavioural explanations dominate, particularly those guided by the Theory of Planned Behaviour (TPB). Household food waste (HFW) studies focus heavily on individual behaviors while overlooking broader institutional influences. This review bridges this gap by examining how macro-institutions, meso-governance, informal institutions (cultural norms), and micro-behaviors connect across existing research.

Research Questions: (1) How is HFW conceptualized across macro-institutional, meso-governance (formal), informal (cultural), and micro-behavioral levels? (2) What empirical imbalances exist across these levels by research design, methods, and outcome measures? (3) Which mechanisms link macro-institutions → meso-governance → informal institutions (culture) → micro-behavior, and which institutional mechanisms remain underexplored?

Methods: PRISMA-guided systematic literature review of Scopus/Web of Science (2015-2026, 100+ studies) using a three-level coding framework integrating Acemoglu's inclusive/extractive institutions, North's formal/informal institutional distinction, and Ajzen's Theory of Planned Behavior. Studies are included if they focused on household or consumer-level food waste, were situated in urban or mixed urban-rural contexts, and offered either empirical or theoretical contributions. To ensure relevance to the dissertation's multi-level analytical framework, only studies examining behavioural, infrastructural, or governance- and institution-related determinants were retained. Studies were excluded if they focused exclusively on supply-chain, retail, or agricultural food loss, relied solely on technological or engineering interventions without social or behavioural components, or were published in languages other than English where translation was not feasible.

Expected Contributions: The review reveals a decisive conceptual gap: behavioural explanations dominate household food-waste scholarship, while governance, infrastructure, and institutions are severely under-theorised. This imbalance results in partial explanations that do not adequately capture the contextual environments in which food-waste behaviour occurs. Hence, the review will serve as the first comprehensive map of HFW research across institutional levels (formal + informal), revealing methodological gaps and underexplored institutional drivers that justify multilevel empirical approaches.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Navigating Urbanization in Developing Countries: Challenges and Opportunities



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1267 - Sustainable And Disaster Resilient Urban Development In India Modelling Through Gis Techniques

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Geographical Information System (GIS) is crucial for assessing sustainable, disaster-resilient Indian cities by mapping hazards (floods, landslides), analyzing vulnerable assets (housing, infrastructure), and integrating data for better planning, creating risk zones, and designing effective strategies like green infrastructure and early warning systems, though challenges remain in data integration and implementation. It helps planners visualize impacts, like Delhi's flood risk or flood mapping, supporting land-use changes for resilience, moving beyond reactive measures to proactive, nature-based solutions for sustainable development.

India's rapid urbanization poses significant challenges to sustainable development and disaster resilience. This assessment examines initiatives, opportunities, and challenges in achieving sustainable and disaster-resilient urban development in India. Sustainable Urban Development Initiatives like Smart Cities Mission and AMRUT aim to promote sustainable urbanization, but face challenges like unplanned growth and inadequate waste management. India faces various natural disasters, and vulnerabilities are exacerbated by urban risks. NDMA guidelines and Sendai Framework implementation are steps towards resilience. Climate-resilient infrastructure, technology integration and community engagement can enhance sustainability and resilience. The assessment highlights the need for integrated urban planning, climate-sensitive infrastructure, and community participation to achieve sustainable and disaster-resilient cities. Leveraging technology and innovation is crucial for effective implementation. By addressing these aspects, India can create livable, resilient cities that support inclusive growth and mitigate disaster risks.

Design urban layouts in 3D for analysis and review Model 3D environments for entertainment and simulation quickly create 3D models using real-world 2D GIS data for cities like New Delhi. GIS play a significant role in full service orientation and has become a core component in the digital infrastructure, enabling the process of governance, planning, and nation building for cities.

This research paper analyses that through proper application of GIS techniques, cities can become smart and disaster resilient.



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1852 - Rethinking Livability Infrastructure Everyday Connectivity And Urban Expansion In A Chinese Megacity

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Background/Hypothesis

Before 2000, what is now a Chinese megacity, Chengdu, was then a much smaller, bike- oriented city whose built-up area lay largely within the 2nd Ring Road. Daily life unfolded within walkable and cyclable distances, structured around dense street networks, open-air tea houses, and a distinctive “slow life” culture. Over the past two decades, however, the city expanded rapidly through successive ring roads, widened arterials, and a metro system now comprising 18 lines. While these infrastructures appear to enhance mobility, this study hypothesizes that they have paradoxically reduced everyday connectivity, increased travel time, and challenged the cultural foundations of Chengdu’s celebrated livability.

Materials and Methods

The research integrates ethnographic fieldwork, participant observation, semi-structured interviews, and oral histories with analysis of planning documents and scholarship on Chinese and global urbanization, city branding, and place theory. A temporal framework traces Chengdu’s transformation from its pre-2000 compact form to its post-pandemic return to the historic core and its broader shift toward stock-based urbanism.

Results

Findings show that new mobility infrastructures consume large amounts of urban land and increase spatial distances between home, work, and daily necessities. Despite improved regional accessibility, residents spend more time commuting and running errands, with less time for leisure and sociability. These changes have accelerated the disappearance of traditional public spaces and weakened the “smoky everydayness” (street-level everyday life) central to Chengdu’s identity. Post-pandemic fiscal pressures, real- estate decline, and demographic slowdown have prompted a strategic reorientation from outward expansion to inner-city regeneration.

Conclusions

Chengdu’s trajectory illustrates a core contradiction of urbanization in developing countries: infrastructure-led expansion enhances macro-mobility while undermining micro-scale connectivity and cultural continuity. The findings highlight the need to rethink livability not as a branding device but as a governance challenge grounded in everyday mobility, spatial equity, and cultural preservation.



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1856 - Urbanization And City Cluster Development In China

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China's urbanization represents one of the most significant socioeconomic transformations in modern history, profoundly shaping both domestic development and the global landscape. Since the reform and opening-up, China has experienced rapid urbanization, with the urbanization rate exceeding 60% in recent years, marking a shift from quantity-driven expansion to quality-oriented development. Under the national strategy of "people-centered new-type urbanization," city clusters have emerged as the primary spatial form for achieving coordinated regional development, optimized resource allocation, and sustainable urban growth.

This study examines the evolutionary trajectory, spatial patterns, and operational mechanisms of China's city clusters, with a focus on the Yangtze River Economic Belt—a strategic region encompassing the Yangtze River Delta, Middle Yangtze, and Chengdu-Chongqing city clusters. Drawing on multi-source data, including statistical yearbooks, geospatial information, and network big data, we analyze the economic, social, infrastructural, and ecological dimensions of urban resilience and inter-city connectivity.

Findings reveal that China's city clusters exhibit distinct developmental characteristics and spatial structures. The Yangtze River Delta demonstrates a polycentric and highly integrated network with strong resilience, whereas the Chengdu-Chongqing cluster shows a dual-core-driven pattern with noticeable inter-provincial disparities. The Middle Yangtze cluster displays a multi-core structure with growing internal linkages yet uneven cross-regional cohesion. Furthermore, the study highlights the role of institutional innovation, infrastructure integration, and regional cooperation in enhancing the resilience and competitiveness of city clusters.

This research contributes to understanding how China's city clusters can foster high-quality urbanization, balance regional development, and enhance adaptive capacity in the face of socioeconomic and environmental challenges. The insights offered are relevant for policymakers and scholars engaged in urbanization and regional planning in emerging economies.



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2302 - Community Led Urban Change In The Gauteng City Region South Africa

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Community-led urban change, including practices often described as DIY urbanism, has attracted growing scholarly attention since the 2010s, particularly in cities of the Global North. These practices involve community-driven interventions, both sanctioned and unsanctioned, aimed at shaping, maintaining, or reimagining the urban environment. In contrast, there remains a relative paucity of research on similar phenomena in cities of the Global South, despite long-standing traditions of informal and temporary urbanism in these contexts. In South Africa, there is increasing evidence of community-driven initiatives that seek to augment or substitute basic municipal services. This “do-it-yourself” approach is largely precipitated by deep systemic challenges within local government, including municipal mismanagement, deteriorating infrastructure, and persistent failures in basic service delivery. This paper examines the emergence and character of community-led urban initiatives in the Gauteng City Region, South Africa’s economic hub and most populous conurbation. Methodologically, the study draws on a desktop audit to map the scope and distribution of such initiatives across the city region. This is complemented by a netnographic analysis of their online presence on social media and in the popular press, as well as semi-structured interviews with representatives from 12 initiatives, which provide insight into their motivations, organisational forms, and place-based politics. The findings suggest that many initiatives are driven by mounting frustration with inadequate municipal service delivery, prompting communities to take responsibility for the maintenance and restoration of basic infrastructure and public spaces. While some initiatives have gained legitimacy and support from local authorities, others encounter resistance and contestation. These practices can be understood as forms of urban resilience, reflecting adaptive responses to shifting modes of urban governance. However, they also challenge and potentially decentre the authority of local government. Moreover, community-led urban change risks reproducing existing socio-economic inequalities in post-apartheid South African cities. As such, these initiatives may contribute to the incremental privatisation and uneven transformation of South Africa’s urban environments.



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2390 - Sustainable Urban Development In The “nusantara” Capital And The 10 Minute Cities Concept

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The development of the Nusantara Capital City (IKN), initiated in 2021, faces various challenges in its implementation, including the continuation of its development. In fact, IKN development continues despite the change in leadership, as it is guided by existing regulations and planning. Some progress has been made, particularly with the construction of basic infrastructure such as roads, bridges connecting cities to the IKN, reservoirs for water supply, and waste management facilities. Furthermore, some offices and residences for civil servants, hospitals, and other facilities have been used. The second phase of development is targeted for completion in 2028, continuing the development of the Central Government Core Area (KIPP), including the construction of legislative offices and the completion of supporting urban infrastructure such as education, health, and economic facilities. The planned ten-minute cities concept, as a part of smart city implementation, needs to be reconsidered in terms of public facility availability, public transportation support, pedestrian areas, and changing people's previously difficult habits to walking and cycling. The 10-minute city proposed in the new capital city is a modification of the 15-minute city concept, as many cities have adopted and modified this concept, such as the 20-minute neighborhood in Melbourne, the Superblock in Barcelona, and the 20-minute town in Singapore. This concept seeks to bring city residents closer to the basic services they need, including housing, employment, commerce, healthcare, education, and entertainment. As a result, it is necessary to conduct case studies on several cities that have implemented this concept. Also, to gain a sense of how sustainable development has progressed in various capital cities.



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2547 - Sustainable Development Of Municipalities In São Paulo Through Idsc Br Insights From Sdg 11 In A Context Of New Urbanization Dynamics In Brazil

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The study evaluates the sustainable development performance of 645 municipalities in the state of São Paulo, Brazil, using the Sustainable Development Index of Cities – Brazil (IDSC-BR), a standardized framework aligned with the 2030 Agenda. In a context of new urbanization dynamics in Brazil—marked by uneven infrastructure provision, socio-spatial fragmentation, and pressures from urban expansion—the research focuses on SDG 11 (Sustainable Cities and Communities) as a key dimension of local sustainability. The central hypothesis is that municipalities display significant heterogeneity in SDG outcomes, and that SDG 11 performance is strongly associated with broader constraints on sustainable urban development. Methodologically, the analysis draws on the IDSC-BR scoring system (0–100), which is built from 100 official indicators and generates comparable scores for each of the 17 SDGs. Results indicate substantial variation across municipalities, with SDG 11 frequently emerging as a limiting factor for overall sustainability performance. Lower scores tend to reflect persistent deficits in urban services, infrastructure, and accessibility, reinforcing challenges linked to unequal urban growth accommodation. The study concludes that the IDSC-BR provides an effective tool for translating global SDG commitments into measurable local benchmarks, supporting evidence-based planning and helping municipalities identify priorities to advance more inclusive, integrated, and sustainable urban development strategies.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Promoting Urban Green Space for an Inclusive and Sustainable Cities



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1766 - Oppressiveness As A Critical Link Between Urban Streetscapes And Residential Preference In High Density Cities

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High-density cities have become a dominant form of human habitat globally, where feelings of oppressiveness often emerge as a salient environmental perception. While previous studies have documented significant links between urban environments and residential preferences, the mediating role of perceived oppressiveness in these relationships has rarely been examined or quantified.

This study aimed to address this knowledge gap by testing a novel pathway model through an online experiment. The model was designed to determine whether, and to what extent, environmental exposure influences residential preference via perceived oppressiveness. Hong Kong was selected as a representative high-density city. Ninety GIF images, each providing a 360° panoramic view, from 90 street locations across the city randomly, were created, and the proportions of streetscape elements in each image were quantified. A total of 1,396 local urban residents participated, each randomly assigned to evaluate three street scenes. Participants reported their perceived oppressiveness and residential preference for each scene.

The model revealed that perceived oppressiveness is a key mediator between urban streetscapes and residential preference, explaining 45.7% of residential preference variance. Tree Canopy and Sky reduced perceived oppressiveness and increased preference, whereas Billboards and Vehicles heightened oppressiveness and lowered preference. Both full and partial mediation effects were observed across streetscape elements.

The study contributes theoretically by establishing perceived oppressiveness as a central mediator linking environmental features to residential preference in high-density contexts. Additionally, the findings have practical implications, providing empirical evidence to inform urban design and policy aimed at creating less oppressive and more livable cities.



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2021 - Greening The Shrinking City In China The Effects Of Environmental Tournaments On Urban Green Space Provision And Accessibility

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Urban green spaces (UGS) are widely recognized as critical infrastructure for promoting ecological diversity, improving public health, and fostering neighborhood cohesion. In China, the “promotion tournament” for local officials has historically prioritized economic growth, but the central government’s recent strategic shift toward ecological civilization has fundamentally transformed these incentive structures. However, whether this “environmental tournament” effectively motivates cadres in shrinking cities to enhance UGS sufficiency and accessibility, as well as the internal transmission mechanisms involved, remain scientific questions worthy of further investigation. Therefore, this study conducts an empirical analysis 287 prefecture-level cities in China from 2010 to 2024, adopting a difference-in-differences (DID) framework augmented by a double machine learning model. The results indicate that incorporating environmental performance into official evaluations significantly expands the area of UGS and improves overall accessibility. This effect is achieved by reducing the reliance on land finance (thereby lowering the opportunity cost of land) and incentivizing the development of scenic spots to boost tourism revenue. Moreover, there exist significant structural heterogeneities in the impact of the environmental tournament on accessibility, with heterogeneous effects contingent on park attributes (size and quality) and population demographics. The study highlights that top-down environmental governance mandates effectively alleviate the adverse impacts of urban shrinkage by increasing “green quantity,” yet the specific mechanisms underpinning these effects lead to an uneven distribution of benefits across the urban landscape. Therefore, it is crucial to refine future environmental assessment criteria, moving beyond aggregate metrics to ensure the qualitative and structural equity of green space provision in support of the Sustainable Development Goals (SDGs).



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2574 - Geoconservation Of Semi Arid Urban Spaces In The La Serena–coquimbo Metropolis Through Chile’s Sernageomin National Geosites Framework

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Background/Hypothesis

The La Serena–Coquimbo metropolis in Chile’s semi-arid Coquimbo Region faces combined climate and urbanization pressures that threaten its distinctive geodiversity, including coastal geological formations and hydrogeological systems that are critical for urban sustainability. Chile’s National Geology and Mining Service (SERNAGEOMIN) manages the National Geosite Inventory (over 500 registered sites), positioning geoconservation as a national policy for geographically grounded environmental management. Hypothesis: semi-arid metropolitan sites warrant inclusion in the SERNAGEOMIN inventory because they provide critical geosystem services—groundwater recharge, erosion regulation, and scientific value—essential for urban resilience in arid contexts.

Materials and Methods

We apply a geographical approach to geoconservation that treats geodiversity as a foundation for urban ecosystem services. The methodology follows SERNAGEOMIN protocols and the geodiversity assessment framework of Ruiz and Flaño (2007) to evaluate semi-arid metropolitan wetlands using terrain analysis, landform mapping, and hydrological assessment. We assess geosystem services across provisioning (aquifers), regulating (erosion control, climatic moderation), and supporting services (soil formation, geological processes). GIS-based spatial analysis (ArcGIS Pro) is used to identify sites with high geodiversity index values following Ruiz and Flaño (2007).

Results

Sites exhibiting high geodiversity index values (Ruiz and Flaño 2007) meet criteria for inclusion in the SERNAGEOMIN National Geosite Inventory. These sites feature active coastal geomorphological processes, distinctive hydrogeochemical gradients, and sedimentological systems characteristic of arid urban environments. Identified services include coastal-aquifer recharge, which is crucial for metropolitan water security; erosion regulation that protects urban infrastructure; and high scientific value for geomorphological research and monitoring.

Conclusions

Semi-arid sites with high geodiversity index values (Ruiz and Flaño 2007) merit formal inclusion in the SERNAGEOMIN National Inventory. This geographically grounded methodology supports the optimization of geosystem services for resilience in arid cities and offers a replicable model for semi-arid metropolises across Latin America.



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1074 - From Blue To Green Enhancing Urban Well Being Through Port–town Innovation In Koper Slovenia

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Based on qualitative and quantitative research in the old town of Koper, this contribution examines the role of the Port of Koper in threatening and improving the quality of life of the inhabitants. On the one hand, the close proximity to the old town is disturbing for the local population (e.g. noise, pollution, crowding at the arrival of cruise ships), but on the other hand, the port is trying to improve the living conditions in the town centre through some innovative practices, such as the green port policy and the allocation of funds for the implementation of measures to reduce the impact of emissions from port activities (grants for interventions such as replacement of windows, soundproofing of walls, renovation of facades, or installation of an air-conditioning unit). In this way, the Port of Koper is in a situation where it is creating social conflicts and is also trying to resolve them, particularly in cooperation with the Municipality of Koper. Based on the opinions of the authorities at the Port of Koper, other stakeholders in the old town, and the local population, I highlight the impacts of the initiatives taken by the Port of Koper to improve the quality of life in the town centre, and how these efforts are reflected in the conflicts.



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1096 - Prediction Of Riverside Greenway Landscape Aesthetic Quality Of Urban Canalized Rivers Using Environmental Modeling

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Canalized rivers are often the product of urbanization. They are an important component of urban blue-green infrastructure whose visual landscape quality affects the aesthetics of a city. Existing research on urban waterways pays little attention to urban canalized rivers and lacks a quantitative interpretation of their visual quality. This study aims to simulate human visual perception and establish quantifiable landscape characteristics for urban riverside greenways. Using a deep learning model to build connections between landscape characteristics and the aesthetic preference of riverside spaces, we establish the best predictive model for the aesthetic quality of urban canalized riverside greenways. We use panoramic photos of rivers in central Beijing and image semantic segmentation technology to extract physical characteristics of landscape composition. We use an ordinary least squares (OLS) regression model and a random forest (RF) model to develop a predictive model for riverside aesthetic quality. The RF model was found to be the most accurate for predicting the aesthetic quality score of the channelized riverside. Trees and bridges are the most important input factors that affect the output score of the RF model. Trees are positively correlated with aesthetic quality, while bridges are negatively correlated. In practice, this model can be used for batch evaluation and aesthetic quality prediction of urban canalized riverside landscapes to help practitioners improve analysis efficiency and guide the management and planning of riverside landscapes.



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1141 - Urban Blue Spaces For Human Well Being And Urban Resilience A Review Of Research And Future Challenges

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Urban blue spaces in cities, such as rivers, lakes, and seas, have long been important elements of urban environments. In the past, they were closely linked to the direct development of cities, while today they represent a key component in the provision of various ecosystem services in urban areas. This paper represents a review of contemporary interdisciplinary research addressing the role of urban blue spaces in enhancing human well-being and supporting urban responses to climate change. The analysis is based on studies from a range of disciplines, including geography, urban planning, public health, psychology, and sustainability science.

The analysis is structured around three interconnected modes of action of urban blue spaces. The first mode is restoration, referring to the renewal of both physical and mental capacities, allowing individuals to recover and regain strength. This mode is grounded in theories that explore human–nature connections and mechanisms of relaxation and psychological recovery. The second mode is instoration, which refers to the strengthening of physical, social, and cultural capacities. This includes activities such as physical exercise, social interaction, and the shaping of meaningful living environments. The third mode is mitigation, which addresses the role of blue spaces in reducing environmental and health risks by moderating temperature extremes, managing runoff from surrounding areas, and reducing flood risk.

The results indicate that the benefits of urban blue spaces are not always straightforward or uniform. They depend on factors such as accessibility, environmental quality, perceived safety, and the broader social context, raising important questions of spatial equity. Based on these findings, the paper proposes a new conceptual approach that links the three modes of action with nature-based solutions, people-centred development, and participatory planning.

The paper argues for understanding urban blue spaces as fundamental urban infrastructure that contributes to public health, social cohesion, and climate resilience, and therefore requires systematic integration into urban and development policies.



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1471 - Localizing Nbs For Inclusive Urban Sustainability Governance Experimentation In Taipei Wetlands

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Urban wetlands are critical blue–green infrastructures that support stormwater regulation, biodiversity conservation, and cultural well-being. As cities seek pathways toward inclusive and sustainable futures, Nature-based Solutions (NbS) offer a means to integrate ecological processes into urban governance and everyday life. This paper examines the Guandu and Huajiang wetlands in Taipei to explore how NbS have been localized through governance experimentation, cross-boundary collaboration, and community learning.

Both wetlands originated from civic mobilization in the 1980s that resisted rapid urban expansion and advocated ecological protection. Over time, strict preservation policies produced unintended ecological consequences—mangrove overgrowth, terrestrialization, and habitat loss—revealing tensions between conservation and adaptation. Through comparative analysis, the study shows how each wetland has evolved along distinct governance trajectories shaped by multi-level institutions, policy instruments, and stakeholder networks.

By tracing ongoing experiments in habitat restoration, water-flow management, and citizen-science monitoring, the research highlights how local governments, scientists, and civic actors co-produce adaptive strategies that balance ecological integrity and social inclusion. Intermediary organizations play a crucial role in knowledge translation, mediation, and participation design, transforming wetlands into arenas for socio-ecological learning.

The paper argues that localizing NbS requires more than technical solutions—it depends on reflexive governance that links global sustainability agendas with local experimentation and inclusive engagement. Through the Taipei cases, it demonstrates how blue–green spaces can act as laboratories for re-imagining the urban not merely as a built environment, but as a living, negotiated socio-ecological system.



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1587 - Understanding The Use Of Blue Spaces Through Observation Of User Behaviour

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Blue spaces are an important part of urban areas, as they combine ecological, spatial, and social functions. Understanding their actual use is crucial for evidence-based planning and management under conditions of increasing environmental and spatial pressures.

Mapping the behaviour of users of blue spaces is based on the systematic observation of space use on, in, and around blue spaces. The method combines spatial mapping (ArcGIS Field Maps) and standardised behavioural coding, whereby the location of activities, the type of activity (active/passive), the social context, the age group and gender of users, as well as temporal and weather conditions are recorded. Observations are carried out according to a predefined temporal pattern focused on periods of increased visitation (selected days of the week, times of day, and seasonal variation), which enables comparability between areas and time periods.

The result of the survey is a spatially explicit database that enables the analysis of the intensity of use, types of activities, and relationships between the physical characteristics of blue spaces and their actual use.

The survey is currently being conducted on, in, and around Rudniško jezero (Mining lake) in Kočevje, a small town in the inland part of Slovenia, separately for two characteristically different parts of the area: (1) a managed and more urbanised part of the lake, intended for recreation, leisure activities, and socialising of the wider public, and (2) a more natural and less accessible part, where use by anglers and local residents prevails, who withdraw to this area from the more managed and crowded part of the lake and where spatial interventions are minimal.

Based on the testing of the methodology, the surveys will be extended to other sample areas; in addition to lakes, rivers and the sea will also be included.

Such a comparative design enables the analysis of differences in the intensity and types of use, behavioural patterns, and the relationship between the level of spatial development and the actual use of blue spaces. The collected data represent an important basis for planning, management, and the evaluation of spatial interventions.



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1928 - Blue Green Infrastructure Environmental Efficiency And Accessibility In Cities Of Russia

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Blue-green infrastructure (BGI) is a strategically planned network of natural and semi-natural spaces and other environmental elements designed and managed to offer a wide range of ecosystem services. The concept of BGI in urban planning in Russia is not well established. From Soviet time more widely used is the ecological network approach (now – blue-green urban network) related with ideas of wild nature in the cities. But by the content and sense both of these approaches are very similar.

During last ten years our research group have conducted several projects, related with different aspects of BGI assessment, including ecosystem services, urban planning indicators, impact of urbanization, urban protected areas and other topics. The aim of this presentation is to summarize the common features of green infrastructure in different Russian cities in the aspect of environmental efficiency and accessibility. The study covered both Russia's largest cities with a population of over 1 million and small towns with different natural conditions for the formation of a BGI, different profiles and financial resources for its maintenance. The assessment of the current state of the BGI was carried out on the basis of quantitative metrics – connectivity, fragmentation, etc. – and qualitative indicators based, among other things, on citizens' assessments of the state of the urban infrastructure.

As a result, we may sum that Russian cities can boast profound green and even blue areas, especially on the high (large elements) and medium (blocks greening) levels. However, this BGI needs much improvement to function efficiently. What is even more important, it is crucial to preserve and develop it, especially in the large cities with a growing population, which means an increasing demand for ecosystem services. Each type of green elements benefits the population in a particular way, meaning that all urban vegetation matters. The green infrastructure management unit should become an important part of the actions striving for a balance between urban comfort and environmental efficiency of BGI.



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2478 - Why Does Polder Landscape Configuration Matter For Flood Adaptation In Urbanizing Lowlands Under Climate Change

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Compact urban form has long been promoted in urban planning for its advantages in land-use efficiency and infrastructure provision. However, in low-lying areas exposed to flood hazards, dispersed spatial configurations may offer greater hydrological connectivity and storage capacity, thereby enhancing flood adaptation, especially under climate change. Polders are a distinctive type of waterfront lowland widely distributed worldwide. In China, centuries of polder development have produced unique water–society–landscape systems, whose spatial configurations may provide important insights for flood adaptation in rapidly urbanizing regions.

This study takes the Ancient Danyang Lake polder area in China as a case study to investigate how changes in polder landscape configuration influence flood hazard dynamics between 1990 and 2024. Flood-season runoff and flood hazard intensity were simulated using the SCS-CN model and a flood detention and retention model. Six landscape indices were employed to characterize the impacts of agricultural reclamation, urban expansion, aquaculture development, and ecological restoration on traditional polder landscapes. A random forest model was further applied to identify the nonlinear response mechanisms between landscape configuration and flood hazard.

The results show that: (1) rapid and spatially dispersed urban expansion, modern agricultural intensification, aquaculture enlargement, and lake-restoration policies have jointly reshaped polder landscape configuration in complex ways; (2) flood hazard intensity has increased overall, with more pronounced interannual variability during the study period; and (3) blue–green infrastructure plays a critical role in hydrological regulation and flood mitigation. Fragmentation of green ecological networks and uncoordinated expansion of farmland and built-up areas significantly increase flood hazard, whereas expanding water bodies, enhancing their connectivity, and maintaining moderately dispersed agricultural and urban layouts effectively suppress flood occurrence.

The findings demonstrate that under climate change, polder-derived landscape configurations—characterized by interconnected water networks, sufficient green flexible spaces, and relatively dispersed urban layouts—are more conducive to improving flood adaptation and long-term sustainability in urbanizing lowland regions.



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1780 - Divergent Peri Urban Pathways In Post Socialist European Second Tier Cities

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Background

The post-socialist peri-urbanisation in post-socialist European states is often described either through morphological change (sprawl, fragmentation) or market signals (land price gradients). This paper argues that the peri-urban fragility emerges from the coupling of these two dimensions: specific urban growth regimes generate hidden infrastructure and mobility costs while being simultaneously impacted by local land market dynamics.

Materials and methods

By using a 1 km² grid for six second-tier cities in Poland and Romania and combining spatial temporal clustering of built-up expansion and land consumption trajectories from 1990 to 2020 with Multiscale Geographically Weighted Regression (MGWR) of land prices. Therefore, we are able to test whether MGWR coefficient signatures and model performance differ systematically across sprawl regimes. By treating fragility as a system state and vulnerability as a process, we additionally derive a peri-urban fragility index from accessibility, morphology and service provision proxies.

Results

Prior modelling shows that MGWR substantially improves fit over Ordinary Least Squares (OLS) Regression across all cities, indicating spatially heterogeneous valuation processes. Spatiotemporal clusters reveal regimes with sharply different land-consumption dynamics, including highly dispersed peri-urban growth with very large increases in built-up surface per inhabitant. The coupled framework identifies which regimes are associated with the strongest market morphology feedbacks and with the highest fragility scores.

Conclusions

By integrating land-use change typologies, multiscale valuation and an operational fragility metric, the study provides a mechanism-oriented explanation of peri-urban divergence and offers a transferable diagnostic for planning and sustainability policies.



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2616 - Identification Of Suburbanization Processes Around Large Cities In Poland (1800 1989)

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Research on suburbanization in post-socialist countries of Central and Eastern Europe has predominantly focused on transformations observed since the 1990s, largely neglecting the long-term historical roots of suburban development. However, suburbanization is a recurring phenomenon accompanying successive stages of urban growth rather than a process confined to the late twentieth century.

This paper aims to identify and analyze suburbanization processes around large cities in Poland over the long-term period from 1800 to 1989. The study covers the eight largest urban agglomerations in Poland: Warszawa, Kraków, Łódź, Wrocław, Poznań, the Tricity, Szczecin, and the Katowice conurbation. These cases represent both monocentric and polycentric urban systems with varying spatial configurations and levels of structural complexity. For most agglomerations, the suburban zone is defined as two concentric rings of municipalities surrounding the core city, with specific adjustments made for the Warszawa agglomeration and the Katowice conurbation due to their particular spatial characteristics.

The research adopts a comparative and long-term perspective; however, the paper is based exclusively on the first stage of the study. A novel method for the analysis of morphological transformations of suburban areas is applied, focusing on the retrospective reconstruction of spatial development patterns. As a result of the analysis, zones of intensive suburbanization are identified around the analyzed urban agglomerations.

By extending the temporal horizon of suburbanization research beyond the post-socialist period, the paper contributes to a more comprehensive understanding of the historical continuity and spatial diversity of suburbanization processes in Poland and offers a framework for reinterpreting contemporary suburban dynamics in Central and Eastern Europe.



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2671 - Cityscape Before And After Earthquake Housing Stock And Territorial Expansion Of Gyumri (armenia)

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Decades after the 1988 Spitak earthquake, which severely damaged Armenia's north-western provinces, post-Soviet development in Gyumri (case study the city) has been shaped by the widespread destruction of the housing stock and by a series of overlapping crises. These included the collapse of the Soviet Union, the subsequent conflict with Azerbaijan, and prolonged energy shortages. Immediately after the earthquake, large-scale efforts were launched to rebuild housing and resettle the population, involving the construction of new urban districts as well as temporary housing for displaced residents. Despite the deepening economic and political crisis, the Soviet state continued to adhere to the principle of accelerated reconstruction, which envisaged a significant territorial expansion of the city. Against this background, the case of Gyumri invites broader reflection on how postsocialist cityscapes are shaped not only by loss and destruction, but also by projects that were prematurely conceived and only partially realized.

Today, Gyumri's cityscape is a fragmented mosaic, characterized by diverse building types and areas in varying states of decay. Central and peripheral residential districts coexist with unfinished or abandoned construction projects that were planned under the Soviet system but never completed. These "suspended" territories – partially built neighborhoods isolated from infrastructure and everyday urban life – remain a structural challenge for the city. While some have gradually been adapted and inhabited, others persist as unused or environmentally degraded spaces.

Drawing on archive satellite imagery, planning documents, and field observations, the study traces Gyumri's spatial development over time. The chronology of construction was analysed using satellite images, allowing individual buildings to be identified. One of the key findings concerns changes in building height and density before and after the earthquake, revealing shifts in both planning priorities and construction practices.



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1149 - Bogotá Urbanism. Ideology Politics And Transformation Of The City 2004 2025.

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This proposal continues a previous investigation into the influences of urbanism ideas on urban planning in Bogotá *. This time, the aim is to examine a more recent period, 2004-2025, which covers six administrations of the city's mayor's office, mostly left leaning and with extensive debate on the ideal of the city, later transferred to the design and construction of both public works and the development itself of residential, commercial, and industrial spaces.

The objective is to examine the last two decades (2004-2025) in terms of the dominant discourses on the ideals of the city—namely, the green city, new urbanism, smart city, climate-resilient city, security city...—and question how these discourses have shaped the Bogota urbanism, influencing urban planning, governance plans, strategies, and ultimately, the city's urban morphology.

For its methodological development, I will use discourse analysis, especially the examination of planning documents, development plans, and in general the documents that support urban governance policies (see for example Mercier 2008)**. These documents will be contrasted with urban policies and the material transformations of the city, in particular the processes of urban expansion, city renovation, and infrastructure construction. It should also be noted that this proposal provides continuity to a previous investigation in which the planning tradition in Bogotá (Montoya G. 2018) and particularly the implementation of the so-called Barcelona model in the 1990s and 2000s (Montoya G. 2014) are examined.

* Montoya G., Jhon Williams. 2014. "Bogotá, urbanismo post-moderno y la transformación de la ciudad contemporánea." *Revista de Geografía Norte Grande* (57): 9-32

** Mercier, Guy. 2008. "Dimensión cultural de la renovación urbana un análisis retórico del urbanismo contemporáneo." *Investigación y desarrollo* 12 (1): 82-117



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1314 - From Metropolises To Towns Spatial-functional Analysis Of Colombian Urban Regions And Systems

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Hypotheses

This research emerges from a simultaneous study about Colombia's urban hierarchy that identifies Cartagena and Barranquilla as metropolitan centers alongside Bogotá, Medellín, and Cali. That study challenges the traditional tricentric model and suggests a broader metropolitan structure. Drawing on these findings, this research hypothesizes that Colombia's urban system has evolved into a polycentric network of interdependent cities. This shift has produced multiple urban regions organized around diverse centers, including towns (pueblos), each with specific functional roles. The objective is to identify these roles and interdependencies to support territorial planning and public policy design.

Materials and Methods

The analysis combined statistical, spatial, and geographic methods applied to six mobility variables: freight transport (solid and liquid), passenger flows (terrestrial and air), and prior residency (last 12 months and 5 years). For each variable, flow matrices were constructed and weighted according to local and national relevance. These matrices were integrated into a composite matrix measuring the intensity of functional interaction between urban centers. Cities were then hierarchically classified, principal nodes identified, and urban systems delineated. Results were validated through expert consultation in territorial studies.

Results

The study identified 34 urban systems grouped into eight major functional and biogeographical regions: (1) Altiplano, Bogotá Savanna, and Central Zone; (2) Northeastern and Northwestern Andes; (3) Inter-Andean Valleys; (4) Pacific–Amazonian Border Corridor; (5) Insular Region, Caribbean Coast, Valleys, and Savannas; (6) Pacific Coastal and Fluvial Region; (7) Northeastern Plains; and (8) Eastern Plains and Forests. Findings reveal a polycentric structure in which major metropolises coexist with intermediate nodes such as Tunja, Villavicencio, and Quibdó.

Conclusions

While infrastructure and transport systems shape socioeconomic interactions, significant gaps persist in the integration of peripheral areas and smaller urban centers. The analysis confirms that urban power in Colombia is distributed across multiple complementary nodes, rather than concentrated in one or three cities. In this context, towns play a strategic role in rural dynamics and urban–rural articulation. Finally, the study demonstrates that there is no single urban model, as territorial conditions—such as river systems—can either fragment or integrate urban subsystems.



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1489 - Territorial Configuration And Urban System Of Gran Bolívar A Geo Historical Approach To Urban Location In The Colombian Caribbean

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Background / Hypothesis

The territorial configuration and urban system of Gran Bolívar represent a key case for understanding the historical formation of cities in the Colombian Caribbean. Since the colonial period, this extensive territory articulated urban networks, spatial hierarchies, and settlement patterns shaped by political, economic, and environmental factors. The central hypothesis argues that the current urban location of Caribbean cities is the result of long-term geo-historical processes whose effects persist in contemporary urban organization and allow the urban to be rethought from a local–regional perspective.

Materials and Methods

The research is grounded in historical geography and geographical structuralism. A historical progression method is applied, tracing territorial dynamics from pre-Hispanic settlements to the early twenty-first century. The study analyzes historical documents, territorial legislation, historical cartography, and population census data from 1835 to 2018. In addition, the spatial dynamics of the main urban centers and their relationships with their hinterlands are examined through territorial analysis and multi-scalar interpretation.

Results

The results show that the location of cities in Gran Bolívar was structured around river corridors, commercial routes, agro-livestock economies, and political-administrative decisions. Processes of urban consolidation, stagnation, and reconfiguration are identified, leading to the formation of hierarchical urban networks. Many cities retain functions inherited from the colonial and republican periods, generating persistent spatial inequalities and strong functional dependencies between urban centers and rural areas.

Conclusions

The study demonstrates that the urban structure of the Colombian Caribbean is the outcome of a complex historical construction in which urban location responds to long-term territorial logics. Rethinking the urban from the case of Gran Bolívar contributes to contemporary debates on urbanization, regional integration, and the role of intermediate cities in Latin America.



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1506 - Mouvements Capillaires Et Circuits Courts De Commercialisation Dans La Dépression Momposina Des Caraïbes Colombiennes Sociétés Paysannes Et Spatialités Ignorées

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La lagune de Zapatos et la dépression Momposina font partie du complexe lagunaire et marécageux de la région caribéenne colombienne ; d'un point de vue hydrologique et physiographique, elles constituent un espace tampon et une interface entre l'intérieur andin et les plaines inondables des Caraïbes colombiennes.

Elles abritent des sociétés amphibies : paysannes, d'élevage et de pêche, qui, parallèlement aux transformations et aux impacts sur l'environnement naturel et les systèmes productifs, luttent aujourd'hui pour des alternatives de survie. Une caractérisation des formes identifiées de circuits courts ou de chaînes productives de commercialisation de produits agricoles et halieutiques locaux est réalisée, en mettant l'accent sur les aspects fonctionnels des modes de transport, des distances en temps, des coûts de distance, de la durabilité, etc., au sein de réseaux familiaux et d'affinité étendus.

On explore les formes alternatives d'échange qui sous-tendent la vie quotidienne des populations vivant dans la zone d'influence du système lagunaire et le monde amphibie de leurs communautés.

Le concept de "capillarité" est introduit, car il permet d'explorer la spatialité des plus petits mouvements d'échange de produits autochtones et l'approvisionnement en produits extérieurs au niveau des groupes familiaux, en relation avec le commerce vers les petits centres urbains et les centres urbains les plus proches.

On met en évidence que les liens et relations des groupes familiaux pour l'échange de leurs produits s'inscrivent dans des réseaux très courts, basés sur l'affinité ; tandis que, de plus en plus, pour l'approvisionnement en produits d'hygiène, épicerie, aliments transformés et autres produits, ils se tournent vers les magasins hard discount. Ces derniers se caractérisent par des prix compétitifs bas, tout en proposant des marchandises qui parcourent de grandes distances avant d'arriver au point de vente, éliminant ainsi les formes locales de distribution au détail.



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C24.46-Water Sustainability => Hydrological Extremes: Changes and Challenges of Coping



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1191 - Global Patterns And Drivers Of Carbon–water Coupling Responses To Climate Change

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Carbon–water coupling (CWC) is a fundamental metric for evaluating the synchrony between ecosystem carbon uptake and water use and plays a pivotal role in regulating land–atmosphere interactions. Understanding how CWC responds to ongoing climate change is critical for predicting terrestrial ecosystem functioning and feedbacks to the climate system. However, the responses of CWC to climate variability remain highly uncertain across different biomes. Recent evidence suggests that CWC exhibits two contrasting response modes under climate change, namely “carryover,” characterized by a lagged and persistent response, and “overshoot,” marked by an amplified but short-lived response. In this study, we quantified global CWC using satellite-derived gross primary productivity (GPP) and evapotranspiration (ET) datasets and systematically explored its spatiotemporal patterns. To disentangle the driving mechanisms behind the “carryover” and “overshoot” responses, we combined partial correlation analysis with explainable boosted regression tree models, enabling both robust attribution and interpretable insights into the controlling factors. Comparisons with ecosystem model simulations revealed that satellite observations consistently captured lower CWC levels in tropical and arid regions, while more accurately reproducing the pronounced strengthening of CWC in polar and boreal ecosystems under recent climate change. Our results further demonstrate that increasing humidification in arid regions tends to enhance the “carryover” response of CWC, whereas warming in temperate regions predominantly induces an “overshoot” response. Importantly, local drought intensity and biotic factors, such as vegetation characteristics and ecosystem resilience, were identified as key determinants governing whether CWC exhibits a “carryover” or “overshoot” response. Overall, this study provides new insights into the dynamic coupling between carbon and water processes in terrestrial ecosystems and offers critical theoretical guidance for improving the representation of carbon–water interactions in future ecosystem models.



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1349 - Hydrological Drought Dynamics In Southern Romania. A Case Study Of The Vedea River Catchment

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Drought has become an increasingly frequent and severe phenomenon in recent decades, exerting significant pressure on river systems, water availability, and ecosystems. The analysis of long-term streamflow variability is essential for assessing hydrological drought patterns and for supporting effective water management strategies, particularly in regions highly vulnerable to low-flow conditions.

This study investigates hydrological variability, with a particular focus on drought dynamics in southern Romania, a region highly sensitive to drought due to its specific hydroclimatic conditions and predominantly agricultural land use. The analysis centers on the Vedea River catchment (which covers an area of approximately 5.430 sqkm) and represents a suitable case study for examining hydrological drought in this part of Romania. Monthly average discharge data from seven gauging stations, spanning the period from the 1960s to the early 2020s, were used in the analysis. The main objective of the study is to identify potential changes in the streamflow regime, with particular emphasis on hydrological drought characteristics (i.e., frequency, duration, and severity). River flow variability was analyzed using statistical indicators, such as the coefficient of variation and standardized streamflow anomalies. Long-term trends in annual and seasonal mean discharge data series were assessed using non-parametric statistical methods, namely the Mann–Kendall test and Sen’s slope estimator. In addition, low-flow conditions were evaluated using the Standardized Streamflow Index (SSI) to quantify drought frequency, duration, and severity.

The results reveal notable changes in the seasonal distribution of streamflow over the study period. Low-flow events have become more frequent and persistent since the 1990s, indicating that river systems are increasingly exposed to hydrological drought conditions. Across the entire study area, predominantly negative trends were observed in both monthly and annual streamflow series, some of which were statistically significant (e.g., in February, September, and November).

The observed reductions in streamflow and the intensification of low-flow conditions highlight the increasing vulnerability of the central part of the Romanian Plain to hydrological drought. These findings underscore the importance of long-term streamflow monitoring for identifying drought characteristics and emphasize the need for adaptive water management strategies in areas where hydrological droughts have intensified in recent decades.



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1796 - Catastrophic Floods In Romania Since 1900 Spatiotemporal Patterns And Socio Economic Impacts

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This study examines catastrophic flood events in Romania with the aim of identifying their main characteristics in terms of temporal dynamics, spatial distribution, magnitude and triggering conditions, as well as their associated socio-economic impacts. The analysis is primarily based on statistical and spatial approaches applied to open-access databases, including EM-DAT, HANZE, and GRDC.

In Romania, floods account for approximately half of all natural disasters recorded since 1900. According to the EM-DAT database, floods dominate the top 20 natural disasters, occupying 18 positions in terms of the total affected (including people and homeless), 17 positions in terms of total damage costs, and 7 positions with respect to fatalities. The deadliest floods were recorded in 1926, May 1970, July 1975, and July 1991. Regarding the total affected, the most damaging floods occurred in July 1975, May 1970, and July 1997, while the highest damage costs were associated with the floods of June 2010, July 2005, and May 1970.

Some of the most damaging floods affected extensive areas of the country, notably those in 1970, 1975, and 2010, whereas others were more localized, including the events of July 1991 and June 2006. The counties most frequently impacted by catastrophic floods are Bacău, Alba, Hunedoara, and Mureș, each recording more than ten damaging events since 1900. These counties are predominantly located in mountainous, hilly, and depression regions, which are particularly prone to severe floods. The frequency of damaging floods peaked in 2005 and 2006, with six events recorded in each year, whereas after 2007 their number declined to a maximum of two per year.

The results highlight the floods' predominance among natural disasters in Romania and reveal clear spatial and temporal patterns of catastrophic flood occurrence over the last 125 years. Flood-related losses show strong variability depending on event magnitude, spatial extent, and regional exposure. The findings underscore the need for improved flood risk management strategies at both national and regional scales, particularly in areas frequently affected by damaging floods.



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2165 - Assessment Of River Channel Lateral Dynamics And Riverbank Erosion Risk A Case Study Upstream Of Larga Jijia

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Introduction

Rivers represent dynamic systems which are in constant evolution. Understanding the mechanisms of channel modeling is essential for anticipating the hydro-morphological hazards associated with this natural process. The analysis this dynamic character allows us to reduce vulnerability to risks and responsibly manage the impact of evolutionary processes on endangered habitats.

Study zone

Our study aims to analyze the channel evolution of the upper course of the Jijia River (Romania) by specifically focusing on the sector located upstream of Larga Jijia. The study area is morphologically challenging, characterized by a wide floodplain and a sinuous path, where the interaction between water flow and alluvial banks produces constant changes in the terrain's configuration.

Materials and methods

To conduct this study satellite imagery from different periods from 1970 to 2025 were used to analyze the differences between riverbanks and quantify the transformations occurred over time. The workflow was based on surface analysis and multi-temporal change detection techniques, overlaying historical documents with recent imagery. Through this multi-temporal mapping approach, areas of lateral erosion were identified. Additionally, a digital elevation model (DEM) was used to simulate water propagation in the major riverbed, allowing the visualization of flood-prone areas across various time steps.

Results

The results indicate active dynamics, particularly in areas with pronounced meandering, where water pressure causes a constant retreat of the shoreline. The comparative analysis reveals that the river channel "migrates" toward terraces previously considered safe. Predictive scenarios suggest that, erosion processes could expand deeper into the settlement and create a new vulnerable area.

Conclusion

This paper analyzes the dynamic evolution of the Jijia riverbed, highlighting how sinuosity and active erosion reshape the channel. Monitoring these temporal transformations enables the assessment of hydro-morphological risk, emphasizing the major danger posed to civil constructions by the combined processes of flooding and continuous riverbank modeling.



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2518 - Flood Related Fatalities In Romania (2000 2025) Filling The Gaps Of Global Databases And Official Statistics

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In Romania, flood events account for more than half of all recorded disasters since 1900 and occupy 18 of the top 20 positions in terms of the number of affected people. The most damaging events are typically fluvial floods and flash floods occurring on hillslopes and intermittent streams, primarily triggered by short-to medium-duration intense rainfall. Many recent events are shorter-lived, affect small and often ungauged catchments, leading to less severe human impacts than past long-duration floods used to on large rivers. This shift poses new challenges for flood risk management and highlights the need to strengthen societal adaptation and resilience.

Building on the methodology of the Flood Fatalities in the Euro-Mediterranean Database (FFEM-DB), this study develops a national database of flood-related fatalities in Romania covering the period 2000–2025. The database documents fatal flood events, victim characteristics, and behavioral patterns, with the aim of improving understanding of individual responses to flood risk. Particular attention is given to cases where delayed or inappropriate reactions, reduced mobility, or low levels of risk awareness contributed to loss of life, even during low-magnitude events.

Data were systematically collected from multiple sources, including the General Inspectorate for Emergency Situations, international databases (EM-DAT and HANZE), technical reports, and online media articles. Spatial and temporal analyses were conducted using maps and statistical indicators. Approximately 300 flood-related fatalities were identified through mass media sources and validated against international databases; however, a proportion of these deaths did not result from severe flood events but were associated with hazardous behavior in the presence of seasonally high waters. Also, most fatalities involved adults and individuals over 65 years of age, with a predominance of males, often linked to outdoor exposure in rural areas. In recent years, flood fatalities have increasingly occurred in small, torrential catchments affected by flash floods, contrasting with earlier periods dominated by floods on large rivers. The proposed database of flood-related fatalities provide a standardized classification framework that supports regional comparisons and contributes to prevention, education, and risk-awareness efforts aimed at reducing future flood vulnerability.



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C24.46-Water Sustainability => Mountain River Basins at a Crossroads: Between Hydrotechnical Use, Environmental Degradation, Resilience and Restoration Imperatives



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1143 - Towards A Systematic Review Of Environmental Assessments And Water Quality Studies In The Vaal River Catchment South Africa

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The Vaal River is a critical freshwater resource in South Africa, supporting ecological integrity, industrial activity, and municipal supply across a densely populated region. Despite its importance, concerns about pollution, ecosystem health, and governance persist, with evidence scattered across environmental impact assessments, municipal water quality records, and academic studies. To consolidate this fragmented knowledge base, we are undertaking a systematic review guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework. This review will apply predefined inclusion criteria such as publication year, geographic coverage, and methodological rigor to identify and synthesize relevant studies and reports. Data extraction will focus on documenting methodologies, indicators of water quality, and key findings across ecological, social, and governance dimensions. By mapping the scope and depth of existing research, the review aims to highlight areas of convergence, methodological diversity, and critical gaps in monitoring and assessment.

This work is directly aligned with several United Nations Sustainable Development Goals (SDGs), including SDG 6 (Clean Water and Sanitation), SDG 14 (Life Below Water), and SDG 15 (Life on Land), by addressing the health of freshwater ecosystems and biodiversity. The anticipated contribution is twofold: first, to provide a transparent and replicable synthesis of knowledge on the Vaal River; and second, to inform future research, policy, and management strategies by identifying underexplored themes and neglected tributaries. This systematic review will serve as a foundation for advancing integrated water resource management and ecological conservation in one of South Africa's most vital river systems.



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1624 - From Monitoring To Actions Innovating Watershed Governance In A Typical Hilly Reservoir Watershed In Southeast China

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Non-point source pollution continues to threaten freshwater security in ecologically sensitive reservoir watersheds globally, posing a particularly complex challenge in subtropical hilly regions where terrain complexity and intense human-nature interactions converge. Addressing the limitations of conventional management strategies—often characterized by fragmented approaches and insufficient integration of monitoring with intervention, this study presents an integrated methodological framework developed through a case study of the Tianmu Lake basin in Southeast China. The framework establishes a continuous workflow linking systematic spatial monitoring, dynamic process-based assessment, and adaptive, multi-stakeholder management. A core innovation lies in the implementation of a tripartite control strategy that simultaneously targets source mitigation through best management practices, enhances interception capacity within critical migration pathways, and optimizes terminal treatment efficiency. This strategy is operationalized and coordinated through a dedicated digital platform designed for real-time water quality target management.

Application of this integrated system over multiple hydrological cycles yielded significant and sustained improvements. Key outcomes included a marked reduction in nutrient concentrations, specifically total nitrogen and total phosphorus, at the basin's outlet, a corresponding steady increase in annual water quality compliance rates, and observable recovery of riparian and aquatic ecosystem functions. The technical and governance model demonstrated here provides a scientifically robust and operationally transferable template for sustainable watershed governance. By successfully merging ecological process understanding with actionable management tools, this work offers valuable evidence and practical insights for policymakers and resource managers in regions worldwide confronting the shared challenge of balancing water resource protection with sustainable socio-economic development in vulnerable landscapes. This contribution advances the international discourse on integrated water resources management by providing a replicable pathway from diagnosis to systemic solution.



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1713 - Mismanaged Plastic Waste In Global Mountain River Catchments

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Mountain river catchments are biodiversity and water-resource hotspots that sustain billions of people. Emerging plastic pollution degrades these resources and poses risks, including secondary microplastic production, with impacts that can propagate downstream to lowland rivers and the oceans. To inform future mitigation strategies at local, regional, and global scales, we map the distribution of mismanaged plastic waste (MPW) across global mountain river catchments.

Our results show the highest plastic pollution in Asian mountain catchments. The maximum estimated load (total MPW: 37,111,630 t yr⁻¹) and numerous hotspots occur in the Himalayas. Similarly high loads are observed in the Andes in Chile, although fewer hotspots are detected there. European mountain catchments (especially in northern Europe) and those in Australia are less polluted, with maxima roughly threefold lower than in Asia and South America. Many high-MPW catchments coincide with regions of extreme rainfall (notably in Southeast Asia), which may accelerate microplastic production during extreme events. In addition, many catchments are bordered by riparian vegetation that can retain plastic, limiting immediate runoff but potentially enhancing local accumulation.

Together, our maps—by capturing the co-occurrence of plastic pollution with factors that facilitate downstream transport (e.g., extreme rainfall), highlight priority mountain regions where improved waste management and could most effectively reduce downstream plastic fluxes.



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2626 - Photogrammetric Reconstruction Of Historical Channel Hydrodynamics And The Hydrodynamic Control Of Mountain Floodplain Biodiversity

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In the twentieth century, many mountain rivers in Europe were subjected to intense anthropogenic pressure, resulting in persistent alterations of channel morphology. These changes were driven mainly by channelization and gravel extraction. The consequences of such modifications for river hydrodynamics remain insufficiently understood. Archival aerial photographs were used as the basis for two-dimensional hydraulic modelling to assess the effects of human activity on flood parameters, channel incision and flood-wave extent in a Czarny Dunajec River reach between 1964 and 2012. The vertical position and geometry of the channel were reconstructed using Digital Elevation Models derived from aerial photographs from 1964 and 1983 and from airborne laser scanning data from 2012. Four representative flood scenarios were simulated in order to quantify temporal changes in key hydraulic variables.

Between 1964 and 1983, hydraulic parameters increased significantly, indicating progressive channel deepening and enhanced transport capacity. In contrast, floodplain flow velocity did not increase during the two largest flood events owing to the expansion of riparian forests, which enhanced surface roughness and reduced flow energy. The increase in discharge capacity was accompanied by a pronounced reduction in flood-wave extent, particularly during the early phase of channel adjustment. After 1983, changes in hydraulic parameters were less pronounced reflecting lower rate of channel incision. The progressive reduction in the extent and frequency of valley inundation led to a decline in floodwater retention potential and to marked transformations of floodplain vegetation, manifested by the dominance of mature tree stands and a scarcity of shrub communities.

This study demonstrates that the reconstruction of past river hydrodynamics using photogrammetry provides essential insights into the functioning of river channels and floodplains during the intensification of human impacts after the 1950s.

The study was carried out as part of Research Project: 2023/49/B/ST10/01387 financed by the National Science Centre of Poland



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2720 - Geoecological Assessment Of Mountain River Basins Of The Caspian Sea Catchment Area

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The investigation into the geoecological state dynamics of mountain river basins within the Caspian Sea watershed, under the influence of climate variability and escalating anthropogenic stress, is scientifically justified by two primary premises. Firstly, climate change poses a critical threat, especially to vulnerable mountain ecosystems. Projections indicate significant restructuring of glacial recession, snow ablation, precipitation, and streamflow regimes across the North-Eastern Caucasus, Azerbaijan, and Iran due to global warming. Analyzing the geoecological evolution of these basins is essential for accurately estimating climatic impacts on regional landscapes and water security. Secondly, substantial anthropogenic loading, stemming from increased population, urbanization, industry, and agriculture, exerts negative pressure on aquatic resources, physicochemical water quality, biotic diversity. An examination of the synergistic effects of climatic drivers and human pressures is mandatory to determine the primary determinants of geoecological integrity and to formulate prescriptive strategies.

The principal objective was the derivation of a methodology for the geoecological evaluation of mountain river basins situated in disparate landscape zones. This required establishing a standardized criterion matrix that incorporates historical trajectories. Concurrently, the study aimed to perform an empirical assessment of these defined evaluation metrics using selected catchments of small and medium-sized rivers spanning the territories of Russia, Azerbaijan, and Iran.

The outcome of the work is a methodology for geoecological assessment leveraging remote sensing data and geoinformation modeling. This technique evaluates the deviation of landscapes from their natural baseline, structured via criterion matrix that respects regional specificity and geographic positioning. Research involved delineating boundaries of small and medium mountain river basins in the Pre-Caspian region, followed by analysis of their landscape structure, land-use classification, and sociocultural processes. Multi-faceted assessment of geoecological criteria was executed, encompassing field investigations with subsequent laboratory analysis of soil, vegetation, water, and sediment samples; monitoring of atmospheric air pollution; quantification of anthropogenic transformation extent; analysis of population size and density dynamics within catchments.

This work was carried out within the framework of large scientific project, “Dynamics of the geoecological state of the mountain river basins of the North-Eastern Caucasus, Azerbaijan and Iran under conditions of climate change and growing anthropogenic load” (Agreement № 075-15-2024-644).



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2722 - Towards A Carpathian Rivers Research And Policy Agenda Science Networks Supporting River Connectivity And Restoration

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Mountain river basins in the Carpathians are increasingly positioned at a crossroads between competing imperatives: hydrotechnical use for flood protection and energy production, and the growing urgency of ecological resilience, biodiversity recovery, and restoration of river connectivity. Despite the expanding European policy framework promoting integrated river basin management and ecosystem restoration (e.g., Water Framework Directive, Biodiversity Strategy for 2030, Nature Restoration Law), implementation remains uneven across the Carpathian countries, where legacy engineering practices, such as embankments, channelization, rigid bank protection, and transversal weirs, continue to dominate river management. These structural measures disconnect rivers from floodplains, simplify channel morphology, disrupt longitudinal sediment continuity, and reduce habitat diversity, thereby undermining both ecosystem services and long-term risk reduction.

This contribution proposes a preliminary, science-network-driven research and policy agenda for Carpathian mountain and submountain rivers, structured around emerging and under-addressed stressors alongside pressing governance debates. Key knowledge gaps concern (i) wood debris dynamics and management, including their dual role in hazard amplification and habitat formation; (ii) macro-plastics transport pathways, retention zones, and monitoring strategies; (iii) sand and gravel mining pressures and sediment-budget imbalance; and (iv) cumulative impacts of water diversion and hydropower expansion framed as “green transition” solutions but frequently associated with flow alteration and ecological fragmentation.

We argue that the Carpathian region requires a shift from risk-control paradigms “against nature” toward approaches “working with nature”, integrating hydromorphological understanding with socio-economic dependencies and political constraints. To advance this shift, we propose establishing a Carpathian Hydromorphology and Waters Advisory Group linking researchers, water authorities, NGOs, and practitioners to foster structured knowledge exchange, harmonize data and assessment methods, and co-develop restoration priorities and joint projects. This agenda supports evidence-based decision-making for resilient, connected, and biodiverse river landscapes across the Carpathians.



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C24.46-Water Sustainability => Water as a Nexus Resource



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1113 - Assessing The True Water Costs Of Mining – The Need For A More Comprehensive Approach

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Background: Mining-related impacts on water are often far more persistent, costly, and extensive than suggested by current reporting frameworks. While water reporting by mines focuses on operational water balances and compliance, impacts transcending mine boundaries and the operational period are commonly overlooked. This is particularly true for indirect effects such as agricultural losses and health risks due to mining-related water pollution as well as post-closure water management.

Methods: Based on a literature review of diverse mining types and regions worldwide, this presentation identifies, categorises and quantifies mining impacts on water resources using selected case studies including high-profile incidences. Analysed impacts include water pollution by acid mine drainage emanating from flooded mine voids and tailings deposits, land degradation, fatalities and infrastructural damage caused by large-scale dewatering of aquifers, and irreversible alterations of regional water balances and hydrological/geohydrological flow regimes.

Results and conclusions: The analysis shows that current reporting tools systematically underestimate long-term liabilities, making it difficult for regulators to assess the true water impacts of mines when granting concessions. Recognizing these overlooked dimensions is essential for improving risk assessments, strengthening licensing decisions, and preventing future generations from inheriting perpetual burdens, especially as global demand for energy-transition metals is set to intensify competition for water resources in water-stressed mining regions.



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1114 - Artificial Intelligence Decarbonisation And Megacities How Emerging Global Trends Exacerbate Water Scarcity – A Nexus Based Analysis

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Background, methodology

For some globally emerging trends such as the green energy transition and artificial intelligence their implications for water are not obvious. Treating water as a nexus resource inextricably linked to energy, food and minerals as complementary building blocks indispensable for human survival, here exemplary case studies are explored how above trends impact water.

Result, conclusions

Decarbonisation: While decommissioning coal power plants reduces cooling water needs this is indirectly overcompensated by rising renewables as extracting critical minerals for solar panels, wind turbines etc. massively increases water consumptions by mines. Phasing out coal also leads to flooding of remaining open pits creating vast water-negative “lakescapes”. A wind turbine placed inside a forest not only displace thousands of trees but also compromises water retention and flood protection while exacerbating water stress by sucking up moist air from the canopy layer. Expanding nuclear around the world will not only need more cooling water but in some instances also heavy water whose production requires some 1.5 million litres of water per litre.

Artificial intelligence: AI is energy-intensive with some associated data centres consuming the equivalent of entire cities. The exponentially growing number and size of data centres and their power units (often SMRs) results in increase water demand for cooling and steam.

Urbanisation: With rural-urban migration continuing unabated over half of humankind now lives in cities. It is not only that water use per capita is several times above rural dwellers but cities often loose large proportions (25-75%) of clean water through leakages. Despite improved treatment technologies, urban water pollution is rising even in affluent cities like the 2023 Paris Olympics illustrated when athletes fell ill after swimming in the river Seine. With predicted increases of droughts, rain intensities and water temperatures (pathogen survival) this problem is set to worsen.



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1330 - Are There Reliable Indicators That Show How Agriculture Is Adapting To Water Stress

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Agriculture is considered the most vulnerable sector to climate change in almost every country in the world. Policy and financial instruments are introduced because agriculture is highly vulnerable to water related risks, such as drought, storms, heat waves or floods. However, there is no clear guidance on what indicators can show the level of adaptation of agriculture to water related risks.

Unlike mitigation, the extent and development of adaptation is more difficult to quantify. In the case of mitigation, it is easier to evaluate measures in terms of how much GHG emissions can be reduced or avoided.

For quantification of adaptation, however, there are no databases or official statistics available, and there is no consensus on which measures are considered as adaptation. Irrigation, for example, is often the focus of subsidy policy instruments, but it is highly investment and maintenance intensive and can cause serious environmental damage.

In the absence of guidelines, we have developed a set of indicators to show how agriculture is adapting, based on literature, statistics, databases, researches, policy and strategy documents and expert consultation.

These indicators include for example conservation tillage and soil cover practices in crop production, grassland cover and grazing intensity; for agricultural water management, water retention, irrigation practices, illegal irrigation and wetlands as land cover; the extent of drought damage to agriculture; behavioural change of farmers and health impacts such as mycotoxins (in connection with droughts and heatwaves).

An Adaptation Report for the Hungarian agricultural sector has been prepared, which includes a significant number of indicators. We have found that a number of indicators are suitable for monitoring adaptation in agriculture, but due to data gaps, lack of continuity in data collection, inaccuracy and low data quality, most of the indicators are not applicable.

We used geographic information methods to present spatial differences in the extent to which soil cover and conservation tillage practices are being introduced; how the ratio of surface water and groundwater used for irrigation is changing, how wetland creation is evolving; whether runoff slowing and infiltration is being supported on cropland, among others.



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1594 - Water Resources–climate Variability–population Nexus In Serbia Implications For Sustainable Development

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Background/Hypothesis

Although the first goal under UN SDG 6 is to achieve access to safe and affordable drinking water for all by 2030, global climate change and demographic trends pose significant pressure on water resources, challenging this goal. Serbia is a moderately water-rich country with around 85% of the population connected to public water supply systems. However, it also faces specific issues, such as unfavourable water balance, with only 10% of total surface water being domestic, and over half of the groundwater capacity is alluvial, with variable amounts. In the context of climate change, this study hypothesizes that climate variability, manifested through increased air temperatures and variable precipitation, directly affects household water demand in Serbia.

Materials and Methods

The research employed various methods with a focus on the geographical aspect. Based on the quantitative data collected from official national and local institutions, case studies were conducted in five Serbian towns located in different regions. By applying statistical methods, such as correlation analysis, hierarchical cluster analysis of cases and multivariate regression analysis, the influence of climatic elements (air temperature, precipitation, relative humidity) on monthly and interannual water consumption in households was examined.

Results

The results indicate the highest correlation between average air temperature and water consumption in one of the summer months in every town. Cluster analysis distinguishes two clusters; however, the years within them vary by towns, indicating microclimatic differences. Additionally, an increase in air temperature and fluctuations in precipitation regimes were observed, which will impact both the availability of water resources and their future consumption.

Conclusions

The findings support the hypothesis that climate variability affects residential water demand. These outcomes can serve the scientific community and decision-makers in forming strategies for water resource management to ensure long-term water security and support the economic and environmentally sustainable development of Serbia.



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2207 - The Nexus Between Green Spaces And Ecosystem Services In A Changing Urban Environment

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Background/hypothesis

The greenspace stress model of urban impact illustrates the interplay between development, conservation, and sense of place. A sense of place is important in this interplay because the connections people have with a place can influence decision-making. A sense of place is not only relevant to architecture and cultural heritage, but is especially important in the conservation of the natural environment. Despite the role that green spaces, particularly wetlands, play in the ecosystem services provided to people living in cities, they are declining rapidly. The nexus between green spaces and water provisioning is vital in a changing urban environment. The aim of this study is therefore to determine whether land use changes surrounding conservation areas affect the ecosystem services provided by urban green spaces.

Materials and methods

Remote sensing images are used to explore land use and land cover changes around urban green spaces. Secondary data on water quality is represented on a map of the study area to illustrate the spatial variation thereof. Interviews with purposively selected specialists inform the interpretation of the water quality analysis and identification of possible pollutants. Secondary data, observations, and interviews provide information about the sense of place and environmental awareness of visitors and decision-makers.

Results

Rapid land use changes in the urban fringe and the catchment area of urban green and blue spaces contribute to the variety of pollutants entering a particular green space. Visitors to the conservation area are often unaware of the stressors that impact the sustainable ecosystem services provided by urban green spaces. Interest groups, on the other hand, possess more knowledge about the natural environment and are willing to make personal sacrifices to protect green spaces.

Conclusions

Environmental awareness can influence the sense of place in urban greenspace and lead to a deeper understanding of the implications of land-use changes for ecosystem services.



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2610 - Comparison And Integration Of Hydrological Models And Machine Learning Models For Monthly Streamflow Simulations At The Global Scale

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With the development of machine learning methods, machine learning models (MLMs) are increasingly recognized as a crucial approach for simulating streamflow. Nevertheless, compared to traditional hydrological models (HMs), there is still a lack of in-depth insight into the advantages and applicability of MLMs across various climatic zones globally. This study compares the performance of four commonly used lumped HMs (GR2M, XAJ, SAC, and Alpine) with four advanced MLMs (RF, GBDT, DNN, and CNN) over 16,218 catchments worldwide. The findings indicate that MLMs do not consistently outperform HMs. Although MLMs show a higher proportion of catchments achieving qualified accuracy levels (Kling–Gupta efficiency (KGE) ≥ 0.2), the HMs excel at the higher proportion of good accuracy (KGE > 0.6). Specifically, HMs demonstrate better performance in Southeastern North America, Western Europe, and much of the Southern Hemisphere. To integrate the respective strengths of both HMs and MLMs, seven multi-model weighting ensemble (MWE) approaches were tested. The best-performing MWE was applied to integrate results from all eight models, thereby further enhancing simulation accuracy. Among these, the Inverse Rank Prediction Combination (InvW) method demonstrated the best performance, increasing the percentage of qualified accuracy by 13% and 6% over the best HM and MLM, respectively. Despite these improvements achieved by InvW, correlation analyses of KGE with humidity index (HI), mean air temperature (Tair), and leaf area index (LAI) highlight difficulties in accurately simulating streamflow in dry, cold, and lower vegetated regions (RHI = 0.36, RTair = 0.1, RLAI = 0.19). Furthermore, simulation accuracy declines notably in areas heavily influenced by human activities, mainly due to hydraulic infrastructure and extensive water extraction. This study provides a comprehensive assessment of various HMs and MLMs across different climatic settings, proposes an effective framework combining their advantages, and identifies constraining factors of accurate streamflow simulation.



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**C24.47-Young and Early-Career Geographers
Commission => Accelerating Transformations Towards
Sustainable Development Goals: Climate Change and
Sustainable Management of Land Systems**



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1261 - High Standard Farmland Construction Policy Agricultural New Quality Productivity And Greenhouse Gas Emissions From Crop Cultivation Evidence From China

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China faces the dual challenges of mitigating greenhouse gas emissions and ensuring food security. Given that crop cultivation constitutes a major source of agricultural greenhouse gas emissions, analyzing the emission reduction impact of China's high-standard farmland construction (HSFC) policy, a crucial food security initiative, holds significant importance. This study calculates greenhouse gas emissions from crop cultivation (CGHGE) from a life cycle assessment (LCA) perspective and evaluates the agricultural new-quality productivity level across 31 regions in China from 2005 to 2022. Subsequently, this study utilizes the continuous difference-in-differences (DID) model to examine the impact of the HSFC policy on CGHGE per unit area. Furthermore, the mediating role of agricultural new-quality productivity in the relationship between HSFC policies and CGHGE per unit area was examined. The results show that HSFC can significantly mitigate the growth of CGHGE per unit area, with an average annual reduction of 62.88%. The regional heterogeneity analysis indicates that HSFC exerts statistically significant negative effects on CGHGE per unit area across both western and eastern China. Furthermore, heterogeneity tests demonstrate that HSFC's emission reduction effects are particularly pronounced in major grain-producing regions. HSFC contributes to emission reductions by enhancing agricultural new-quality productive forces, which subsequently lead to lower CGHGE. The findings of this study suggest that governments should implement differentiated and targeted policies for HSFC, with particular emphasis on the crucial role of new-quality agricultural productivity in reducing CGHGE.



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1520 - Rethinking Workable Solutions For Saving Cultivated Land Use And Enhancing Climate Adaptation Through Diet Shifts

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China's rapid economic development has profoundly transformed residents' dietary patterns, which has not only intensified pressure on cultivated land but also posed severe challenges to climate change response. Establishing a sustainable dietary system helps ensure China's food and nutrition security. In this study, we designed nine types of dietary shift patterns and developed a multi-regional input-output model at high sector resolution to assess the changes of cultivated land use and greenhouse gas (GHG) emissions. Moreover, we explored the linkages among nutritional quality, food affordability, cultivated land use, and GHG emissions across different provinces and proposed differentiated strategies to facilitate dietary transition. We found that adopting alternative diets increased the intake of beneficial nutrients but also inevitably increased the intake of restricted-intake nutrients. Environmental impact analysis reveals that the consumption of grain and meat contribute to 70% of cultivated land occupation and 90% of GHG emissions. Except for the High-Meat scenario, the reduction in meat consumption has positive effects in all other dietary scenarios, leading to 6-35% decrease in embodied cultivated land and 11-43% reduction in embodied GHG emissions. Moreover, the affordability assessment indicates that western regions of China face greater affordability challenges in diet transition. Our findings highlight the complex trade-offs and synergies among nutritional quality, food affordability, cultivated land use, and GHG emissions through diet shifts. Developing differentiated dietary transition strategies is crucial for achieving multiple co-benefits.



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1554 - Agricultural Land Use System Management For Coping With Climate Change

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The relationship between climate change and agricultural land-use system is complex. Agricultural land-use system is not only susceptible to climate change, it also directly or indirectly produces a large amount of greenhouse gas emissions (GHG), which brings challenges to the climate change mitigation. The management of agricultural land-use system should not only adapt to the adverse effects of climate change on agricultural land use activities, firmly keeping the bottom line of national food security, but also fully tap the potential for GHG reduction and carbon sink increase in agricultural land-use system, alleviate climate change and achieve the national dual-carbon target through multiple initiatives. Agricultural land-use system management in response to climate change aims to realize the coordinated optimization of water conservation, yield stabilization and GHG reduction under climate change impacts. Firstly, we should keep the cultivated land protection as the core and keep the red line of cultivated land and water resources. It's important to establish climate-adaptive dynamic matching mechanisms for water and land resources, optimize the spatial layout of agricultural planting and adjusting the planting structure suitable for water. Secondly, we should strengthen the low-carbon oriented agricultural industry layout and production technology optimization, strengthen green supply chain management for agricultural products, improve GHG emissions efficiency in agricultural land-use systems and promote technology research and development in GHG reduction and carbon sequestration. Thirdly, in order to achieve a win-win situation of “water conservation”, “food preservation” and “low carbon”, it is possible to strengthen the synergistic and optimal management of water, land, energy, food and GHG, and to enhance the efficiency of water and energy resources use through large-scale land management, planting structure optimization, and precise fertilizer and irrigation, so as to promote the low-carbon development of the agricultural land-use system.



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1830 - Process Based Assessment Of Future Cropland Flooding Under Climate Change Integrated Evidence From Extent Depth And Duration

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Flood disasters are becoming increasingly frequent and severe, and clarifying the evolution of flood characteristics under climate change is critical for basin-scale flood governance and climate-adaptive agricultural planning. Using the Second Songhua River Basin (SSRB) as a representative mid-latitude basin, this study employs a calibrated Rainfall-Runoff-Inundation (RRI) model driven by bias-corrected CMIP6 multi-model ensemble (MME) precipitation to quantify future flood inundation dynamics in terms of extent, depth, and duration. Simulations were conducted for two emission scenarios (SSP245 and SSP585), two time horizons (near- and far-future), and two return periods (50- and 100-year). Results show that the RRI model reproduces historical flood processes well ($NSE > 0.78$). Under future climate scenarios, floods intensify consistently—exhibiting larger spatial coverage, greater depth, and prolonged duration—with high-risk zones concentrated in the low-lying middle-lower plains and confluence areas. Cropland inundation is projected to increase substantially, especially under SSP585, where far-future inundation reaches 3,107-3,287 km², with approximately 50% of cropland inundation exceeding 2 m in depth and 34% lasting over three days. Depth and duration are positively correlated, forming spatially contiguous deep-and-long inundation belts. These findings highlight a shift from localized, short-lived floods to prolonged, region-wide inundation under warming conditions. Based on these results, a depth-duration classification framework is proposed to guide cropland drainage, flood retention, and climate-adaptive agricultural planning. This study provides a transferable and management-oriented quantitative foundation for cropland inundation risk assessment and supports decision-making for adaptive planning and management of agricultural flood and drainage under climate change.



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2392 - Unpacking The Compactness Emission Nexus With The Moderating Role Of Environmental Governance Evidence From Urban Built Up Areas In Eastern China

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Compact development and low-carbon development in urban areas are critical pathways to tackle the problems concerning urban sprawl and climate change, which are pivotal for fostering and achieving urban sustainability. However, whether pursuing urban compactness constrains the realization of low-carbon goals remains to be elucidated. Accordingly, this study investigates the relationship and possible strategies for synchronizing compact urban development with carbon reduction. Using the panel data from 84 cities in eastern China (2012-2022), the study first measures urban compactness through land use intensity (density of POIs per km²), population density (population per km²) and land use mix (POI category richness); carbon emissions are measured by per unit built-up area carbon emission (UCE) and per capita carbon emissions (PCE), derived from the ODIAC dataset at 1 km×1 km resolution. Then, the study employs two-way fixed effects models to identify their relationships and moderating models to analyze the role of environmental governance. Conclusions are threefold. (1) the degree of urban compactness in eastern Chinese cities has increased over the past decade; (2) Different dimensions of urban compactness have varying impacts on carbon emissions. Population density exhibits a significantly negative effect on both UCE and PCE, indicating a scale effect of population agglomeration in reducing carbon emissions. In contrast, land use intensity significantly elevates carbon emission levels. (3) Environmental governance plays a significant moderating role in strengthening impacts of population density on carbon emission mitigation. Under high governance intensity, the marginal effect of population density on UCE reverses from +0.37 to -1.25, while its negative effect on PCE is further reinforced from -0.46 to -12.83. These offer insights and implications for the developing cities to confront the climate-urbanization challenge and sustainability transition pressure.



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**C24.47-Young and Early-Career Geographers
Commission => Geographies of Sustainability in
Uncertain Times: Young Geographers' Perspectives on
AI Ethics and Shifting Research (Funding) Agendas**



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2611 - Navigating Academic Space Experiences Of Young And Early Career Geographers

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Young and early-career, and emerging academics face a wide range of structural, institutional, and relational challenges that may hinder professional recognition, delay career progression, and affect long-term retention in academia. In geography, these challenges are further shaped by disciplinary specificities such as fieldwork requirements, interdisciplinary expectations, intensity of collaborations and uneven access to research infrastructures across regions. This paper examines the experiences of young, early-career, and emerging geographers worldwide, with the aim of identifying common patterns, national and institutional differences, as well as critical gaps in support systems at the beginning of scientific careers.

The study is based on an international questionnaire survey targeting young and early-career geographers at all the levels, from Master's, PhD, postdoctoral, to early employment stages. Participants were purposively recruited through the mailing lists of International Geography Union commissions and further expanded via snowball sampling. Particular attention was paid to ensuring geographical balance, age balance, and gender balance, in order to capture diverse academic contexts and career pathways.

The survey explored working conditions and access to research resources, including funding opportunities, fieldwork and logistics, publication processes, conference participation, and the use of emerging tools such as artificial intelligence technologies. It further examined workload characteristics, the alignment between individual competencies and assigned tasks, opportunities for skills development, mentoring practices, and the nature of professional relationships within research teams and institutions. Respondents were also invited to reflect on unmet needs, expectations from supervisors and institutions, perceived career progression, and self-positioning relative to peers.

The results highlight both shared challenges and context-specific differences related to institutionalization, mentorship, workload distribution, career promotion, and socio-cultural factors. By providing comparative insights across countries and research environments, this study contributes to ongoing discussions on academic precarity and offers evidence-based perspectives to inform institutional policies and support mechanisms for the next generation of geographers.



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**C24.47-Young and Early-Career Geographers
Commission => IGU-YECG and AGA-YGWG Young
and Early Career Geographers Best Paper Award 2026**



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1156 - Feminisation And Gender Dynamics In Scientific Production The French Journal L'Espace Géographique As A Case Study (1972 2022)

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I hereby submit my article, “Feminisation and Gender Dynamics in Scientific Production: The French Journal L'Espace géographique as a Case Study (1972–2022)”, published in L'Espace géographique, for consideration for the award for the best scientific article by a young geographer. This article contributes to the geography of science by analysing the long-term evolution of gender relations within the production of geographical knowledge in France.

The study is based on a mixed-methods approach combining a gendered quantitative analysis of mastheads and contributors over a fifty-year period with qualitative interviews conducted with major figures in the editorial history of L'Espace géographique, including Roger Brunet, the journal's founder, and Denise Pumain, a central actor in its scientific and institutional development. This methodological framework makes it possible to move beyond purely numerical indicators of feminisation and to analyse both the visible and less visible dimensions of academic production. Adopting a diachronic and comparative perspective, I situate the journal within broader transformations affecting French academic geography, while also comparing its trajectory with that of other leading disciplinary journals.

The originality of this article lies in its focus on scientific journals as key institutions that structure careers, recognition, and power relations within the discipline. Rather than approaching feminisation as a linear or purely quantitative process, I highlight the differentiated roles occupied by women over time and question the persistence of gendered hierarchies behind apparently progressive indicators. In doing so, the article contributes to ongoing debates on gender inequalities in academia and renews approaches in feminist geography and the sociology of science.

I am a young geographer affiliated with Université Paris 1 Panthéon-Sorbonne and the research unit Géographie-cités. My research focuses on geographers themselves, their professional practices, and the social and institutional structures of the discipline. Situated at the intersection of geography, gender studies, and the history and sociology of scientific knowledge, my work seeks to develop reflexive and empirically grounded approaches to the study of geography as a scientific field.

Through this article, I aim to demonstrate the innovative potential of early-career research in geography and my commitment to methodologically robust, critically engaged, and socially relevant scholarship.



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1277 - Reframing The Dualistic Nature Of Ride Hailing For Women Empowerment Versus Adaptive Preferences

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The rapid expansion of new technology-induced mobility services has transformed urban mobility, raising critical questions about their role in promoting gender equity worldwide. This study investigates whether ride-hailing services empower women by enhancing their mobility or whether they simply reflect adaptive preferences shaped by existing structural inequalities. Using Chengdu, China, as a case study, this article employs survey data from 1,006 respondents and mobile phone trajectory data covering more than 96,000 trips to analyze the gendered impacts of ride-hailing. The findings reveal that women, particularly those with lower incomes, higher education levels, and children, perceive enhanced mobility through ride-hailing, although this improvement is unevenly distributed across neighborhoods with existing transport infrastructure. Ride-hailing complements public transport where metro services are less accessible, but gender disparities in travel distances and activity spaces persist. The article concludes that ride-hailing services exhibit a dual role from the Global North to Global South: empowering women in opportunity-rich contexts and reinforcing existing constraints in response to insufficient alternative options. Theoretically, this debate provides a prior discussion on how modern smart mobility dynamically interacts with gender-specific constraints and opportunities through a feminist geography lens: These constraints and opportunities are constructed and shaped not only because of socioeconomic disparities between genders and within the group of women, but also in terms of competition and complementing existing transportation resources in space. Ride-hailing services, as market-oriented products, highlight the tension between improving access for some and exacerbating disparities for others, particularly those excluded due to socioeconomic constraints, creating intersectionality within women and echoing the critiques of neoliberal feminism on how neoliberal policies emphasize individualism and market-driven solutions that can re-create intragender disparities. Thus, policies that fail to differentiate between empowerment and adaptive preferences risk perpetuating systemic inequities or misinterpreting women's usage patterns as evidence of success.



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1299 - Understanding And Predicting Multi Layer Urban Network Inequality Policy Insights From Structural-causal Deep Learning Models

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This study introduces an integrated predictive framework—the Causal Structure-Informed Neural Network–Deep Urban Network (CSINN–DUN)—to address the limitations of traditional urban models in capturing high-dimensional, multi-layered interactions. The CSINN module embeds empirically derived causal graphs into neural network architectures, enabling the representation of nonlinear feedback among key endogenous variables such as GDP, wage levels, firm location choice, and housing price. Complementing this, the DUN module employs a two-stage, multi-objective deep learning design to predict the existence and magnitude of flows across four urban networks: commuting, non-commuting mobility, trade, and innovation. This hybrid approach combines causal interpretability with predictive accuracy, supporting scenario-based analysis and policy evaluation.

The framework is applied to simulate future network evolution under demographic and infrastructure scenarios for 2030, 2040, and 2050. Results reveal that overall network inequality remains relatively stable, with Gini coefficients increasing only marginally over time. However, the drivers of inequality exhibit strong heterogeneity across network layers. Population dynamics tend to reinforce polarization in mobility networks, while aviation expansion amplifies spatial concentration, particularly in trade and innovation systems. In contrast, conventional rail and high-speed rail exert countervailing effects, mitigating inequality by enhancing connectivity among peripheral regions. These findings underscore the need for differentiated, network-sensitive planning strategies that integrate demographic trends and transport investments to promote balanced regional development. By bridging causal inference and deep learning, the CSINN–DUN framework offers a scalable and interpretable tool for anticipating urban network trajectories and informing evidence-based spatial policy.



IRC 2026
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Exploring the Earth, Connecting Worlds



1322 - Effects Of Fallow Periods On Soil Physicochemical Properties Under Jhum Cultivation In West Garo Hills District Meghalaya India

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Shifting cultivation is widely practised in tropical regions as a primary means of subsistence. In recent decades, the progressive reduction in fallow duration has become a major issue, as inadequate regeneration time accelerates soil nutrient depletion, diminishes crop yields, and poses serious risks to household food security. This agricultural method is also termed differently as ‘slash and burn agriculture’ or ‘swidden agriculture’. In the North-Eastern part of India, shifting cultivation is known as ‘Jhum’. To evaluate the influence of differential fallow periods on the physicochemical status of jhum-affected soils and to estimate the minimum fallow duration essential for sustainable soil fertility regeneration in the West Garo Hills District of Meghalaya. Soil samples were collected from 23 jhum cultivation plots with fallow periods ranging from 1 to 15 years, along with two natural forest patches for comparison. Soil samples were obtained from a depth of 0–15 cm and analyzed for physical and chemical properties. The study revealed that longer fallow periods (7–15 years) resulted in higher proportions of fine soil particles (silt and clay), along with increased levels of pH, organic carbon, available nitrogen, phosphorus, and potassium. Soil fertility was found to be lowest in areas with less than 4 years of fallow and showed significant improvement from the 7th year onward. This study provides empirical evidence supporting the importance of extended fallow periods in restoring soil fertility under jhum cultivation. It highlights the threshold fallow duration (7–8 years) necessary to regain soil health and sustain productivity, offering critical insight for sustainable land management practices in the jhum cultivation method.



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1492 - Prospecting Futures Navigating Uncertainties Through Back Up Plans In Bodoland Northeast India

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The expansion of higher education in India has unfolded alongside rising youth unemployment and deepening uncertainty under neoliberal restructuring. Uncertainty has become a pervasive yet uneven structure of feeling, shaped by class, caste, ethnicity, gender, age, and place. These differentiated conditions shape how young people imagine, defer, or rework their futures. This paper focuses on Bodoland, a peripheral region in northeastern India marked by a shift from prolonged conflict and statehood movements to development-oriented aspirations. It examines how young people navigate precarious futures under conditions of prolonged uncertainty. The analysis draws on qualitative fieldwork with young people aged 18–30 between 2021 and 2023. The paper conceptualises “backup plans” as everyday strategies for managing uncertainty. Building on scholarship on timepass (Jeffrey, 2010) and the hustle economy (Thieme, 2018), it argues that backup plans represent a form of situated, future-oriented strategising rather than passivity or mere survivalism. These practices allow young people to hold multiple possible futures in tension when long-term planning feels unattainable. The paper shows how education, informal work, care responsibilities, and spatial mobility are actively juggled to keep futures open and adaptable. Such practices reveal how uncertainty is negotiated in everyday life rather than simply endured. The paper contributes to geographical debates on youth, uncertainty, and futures by demonstrating how marginalised young people exercise agency within structurally constrained socio-spatial conditions.



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1776 - Uneven Geographies Of Invisible Labour Of Unpaid Domestic And Caregiving Work In India Evidence From Time Use Survey 2024

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Abstract

Unpaid domestic and caregiving work is a major component of the economy but it is persistently undervalued while calculating economic and social reproduction, where women bearing is significantly disproportionate in this aspect. Despite its critical significance, unpaid and caregiving work has remained largely invisible in the conventional economic and spatial analyses studies. This study uses the Time Use Survey (TUS) 2024 and examines the gendered and spatial patterns of unpaid domestic and caregiving all across states and union territories of India, with particular emphasis on rural–urban differences and its implications for female labour force participation. The study draws upon sex-disaggregated indicators of unpaid domestic and caregiving work for computing gender gap, rural–urban differentials, and a Composite Unpaid Work Burden Index (UWBI) recording women’s relative unpaid workload vis-à-vis men. State-level geographical variations have been identified using spatial visualization techniques, whereas Geographically Weighted Regression (GWR) is applied to analyzing varying relationships between unpaid domestic and caregiving work burden and Female Labour Force Participation Rate (FLFPR). The results based on index and spatial mapping reveal considerable gender disparities in unpaid domestic and caregiving work across all states and union territories, with women contributing significantly more in unpaid labour than men. The spatial patterns of distribution in unpaid domestic and caregiving work are found to be highly uneven and showing pronounced gap and the regional heterogeneity. Integrating both the feminist economic perspectives with geographical analytical approach, this study highlights the importance of recognizing spatial dimension in order to understand gendered labour inequalities over the space. The findings underscore the need for region specific targeted, gender-responsive policy interventions which aims toward reducing unpaid domestic and care burdens on women and enhancing their formal economic participation in India.



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2385 - Reimagining Intra Asian Student Mobility Transnational Imaginations Of Asian International Students In Taiwan

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Existing research on international student mobility has predominantly focused on Asia–West trajectories, resulting in the persistent under-theorisation of intra-Asian educational migration within migration geography. Taking Taiwan’s higher education system under the New Southbound Policy as an empirical case, this paper examines how student mobility within Asia is spatially produced, imagined, and governed. The study adopts a mixed-methods research design, combining survey data from 585 degree-seeking students from New Southbound countries with 82 in-depth interviews conducted across seven public and private universities in Taiwan.

Theoretically, the paper integrates the concepts of transnational imagination and migration infrastructure to demonstrate that student mobility is not simply the outcome of individual preferences or rational calculations. Rather, it is co-produced through policy regimes, intermediary institutions, family narratives, and regional political–economic positioning. Empirically, the analysis identifies three stable types of transnational imagination shaping students’ perceptions of Taiwan: (1) a technical springboard imaginary, in which education is understood as convertible into industrial and technological capital; (2) a safe base imaginary, emphasising everyday security, social stability, and religious friendliness; and (3) a Mandarin–identity field imaginary, centred on language acquisition and cultural repositioning.

These imaginaries exhibit structural variation across national groups and intersect with differentiated migration infrastructures, producing multiple and asymmetric post-graduation mobility pathways rather than a singular “stay in Taiwan or return home” choice. Based on these findings, the paper argues that intra-Asian student mobility should be reconceptualised as a form of spatially embedded lateral migration. Education, in this context, is not an endpoint but a key mechanism through which future mobility trajectories within Asia are continuously reconfigured, rather than merely reproducing existing Asia–West hierarchies.

The paper therefore advances a core theoretical intervention in migration geography and education geography by incorporating education governance into regional migration theory, rearticulating Asia as an internally differentiated and continually reconstituted space of mobility. This analysis further offers a spatially sensitive geographical perspective for understanding the future governance of educational migration and talent mobility in Asia.



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2708 - The Mechanism Of The Continuation Of The Riverside Or Outside Of Levee Settlement In The Modern Japan

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This study reconsiders the relationship between rivers and humans in the modern era by focusing on the mechanisms underlying the survival of legal (non-squatter) riverside settlements in Japan.

Today, Japan faces a complex situation: while river flooding is being intensified due to climate change, the utilization of river spaces is being promoted in the context of deregulation and urban regeneration. Since the modern era, flood control concepts introduced from the West have made rivers “distant water” separated by the levees for Japanese people. On the other hand, a small number of settlements remain between the levees and the river, that is, on the riverbed. These settlements were conveniently located for livelihoods such as agriculture, boat transportation, and fishing. Even after these livelihoods declined, their convenience and scenery have led to their use as residential areas or tourist destinations. The residents live modern lifestyles while understanding the risk of flooding to a certain extent, and their existence is legally accepted without issue.

This study uses discourse analysis of parliamentary minutes, local history or flood history books, local newspapers, and interviews to elucidate the mechanisms by which these riverside settlements have survived to the present day from the perspectives of residents and the government. The study is conducted in the Kiso-Sansen River Basin (Kiso, Nagara, and Ibi Rivers), one of Japan’s greatest rivers.

In recent years, political ecology and vulnerability perspectives have been attracting attention when it comes to flood risk. This study understands the riverside settlements not as areas where problems arise, but as places of “dynamic equilibrium” between residents and rivers and explores a more realistic framework for their coexistence.



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Exploring the Earth, Connecting Worlds



Thematic => Assessment of Environmental Impacts in Mountain Geosystems Using GIS Technologies



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Exploring the Earth, Connecting Worlds



2013 - Predicting Vegetation Alliance Distributions Under Sample Limited Conditions To Support Environmental Assessment In Alpine Regions

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Accurate mapping of vegetation types is a critical foundation for regional environmental assessment, biodiversity conservation, and ecosystem risk analysis, particularly in data-scarce alpine regions. However, predicting the spatial distribution of fine-grained vegetation units such as alliances remains challenging due to limited and unevenly distributed field samples. This limitation is especially pronounced in high-altitude environments, where rare or narrow-niche communities often play a disproportionate role in ecological sensitivity and environmental vulnerability. To address this challenge, we propose KnowSim, a knowledge-driven GIS approach that integrates expert-defined ecological rules to evaluate environmental similarity between locations. Rather than relying solely on data-intensive statistical learning, vegetation types are predicted by assigning each location the alliance of its most ecologically similar reference site, enabling robust spatial inference under sample-limited conditions. The approach was applied to two contrasting regions of the Tibetan Plateau (Bome and Zoige), representing distinct climatic and topographic settings typical of alpine environments. Results show that KnowSim consistently outperforms conventional statistical models, including Random Forest, XGBoost, Support Vector Machine, and Logistic Regression, in terms of overall accuracy and representation of vegetation diversity. Performance gains are particularly evident for sparsely sampled alliances, with accuracy improvements of up to 24.6% for alliances with fewer than five training samples.



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2519 - The Upper Forest Boundary Dynamics In Various Landscape Zones Of Armenia Using Multitemporal Spatial Data

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The upper forest boundary is an important ecotone that responds to climatic and anthropogenic changes. Under conditions of global warming, it is expected to shift upward in mountainous areas, but in regions with a long history of economic development, such as the Lesser Caucasus, this dynamic may be more susceptible to local factors. The upper forest boundary was studied in four areas of the Republic of Armenia, which are characterized by different landscapes, altitudinal zones, and forest cover species composition.

The current position and dynamics of the upper forest boundary are determined not so much by general climate change as by the combined influence of relief (exposure and slope steepness), microclimate, and anthropogenic activity (grazing, logging, forest restoration).

Multi-temporal spatial data were used for the analysis: historical topographic maps (1898-1905, 1942-1943), Corona/Keyhole satellite images (1970-1983), modern PlanetScope satellite images (2021-2025), and our own aerial photographs taken with UAVs. Field routes were laid out along key sections of the upper forest boundary, accounting for the diversity of exposures and altitude zones.

Analysis over a 125-year period revealed local changes across all key study areas driven by geographical factors, but no clear overall trend in rising or falling upper forest boundaries. All sites show marked spatial heterogeneity: in some areas, the boundary has receded by 30–50 m (mainly on southwestern slopes), which is associated with intensive grazing, local logging, and erosion processes. In others, it has advanced upward by 20–30 m, especially on northern and northeastern exposures, where reforestation has been carried out, and anthropogenic pressure has decreased. It is worth noting the micro-relief factor, which has played a key role in the scrub encroachment in the territory near the upper forest boundary.

The dynamics of the upper forest boundary in key areas across different landscape zones are predominantly local and heterogeneous, driven by interactions among geographical factors. General climatic trends here vary with relief, microclimate, and anthropogenic activity. Field methods, supplemented by remote sensing data, have enabled the interpretation of these complex processes and the identification of the dominant drivers of change.



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2529 - Assessment Of Environmental Impacts In Mountain Geosystems Using Gis Technologies A Case Study Of Himachal Pradesh India

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Mountain geosystems are among the most fragile and dynamic environments on Earth, characterized by complex topography, sensitive ecosystems, and high vulnerability to both natural and anthropogenic pressures. Himachal Pradesh, located in the Western Himalayan region of India, represents mountain geosystem, where rapid infrastructure development, hydropower expansion, urbanization, land-use change, and climate variability have significantly altered natural landscapes. Frequent landslides, flash floods, forest degradation, and river system modifications highlight the need for integrated environmental assessment approaches in the state. In this context, the present study focuses on Himachal Pradesh as a case study to assess environmental impacts in mountain geosystems using Geographic Information System (GIS) technologies as an integrated analytical framework. The study examines spatial and temporal environmental changes across selected mountain river basins of the state, such as the Beas, Sutlej, Ravi, Chenab, and Yamuna basins, which are ecologically sensitive and development-intensive. The research emphasizes the application of GIS and remote sensing tools to evaluate key environmental parameters, including land-use/land-cover (LULC) dynamics, slope stability, drainage characteristics, vegetation health, erosion susceptibility, and anthropogenic pressure indicators. Digital Elevation Models (DEMs), multi-temporal satellite imagery, and thematic layers are utilized to analyze terrain attributes, watershed behavior, and ecological sensitivity across varying altitudinal zones of Himachal Pradesh. GIS-based overlay analysis and multi-criteria decision-making (MCDM) techniques shall be employed to delineate environmentally vulnerable zones and identify areas exposed to high cumulative stress. The methodology enables a shift from traditional, project-specific environmental assessments toward a basin-scale and landscape-level evaluation of cumulative environmental impacts, which is particularly relevant for a mountainous state like Himachal Pradesh. By integrating hydrological, geomorphological, and ecological datasets, the study demonstrates the effectiveness of GIS in predicting and mapping hazards such as landslides, soil erosion, floods, and habitat fragmentation, which have intensified in recent years due to extreme weather events and unplanned development.



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2622 - Monitoring The Condition Of Mountain Grassland Across Altitudinal Zones Based On Remote Sensing

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¹

Natural grasslands are crucial ecosystems, covering more than 40% of the global terrestrial surface and approximately 70% of the world's agricultural land. Grasslands are essential for livestock production, serving as the primary forage resource and contributing directly to food security, particularly in mountainous, land-scarce, and agriculturally marginal regions. However, grasslands, especially in mountainous regions, are under threat of degradation and desertification driven by both anthropogenic pressure and climate change. According to climate change forecasts, Armenia's mountain grasslands (57.3% of agricultural land) face increasing risks of degradation and desertification, with a projected decline in extent over the next 100 years. Thus, systematic monitoring and state assessment are essential, particularly under conditions of altitudinal zones. The study focuses on natural grasslands within the Nerkin Sasnashen rural community of Aragatsotn marz, covering an area of 4,660 ha and located on the southwestern slope of the Aragats volcanic shield, extending from northeast to southwest. The landscape comprises semi-desert, dry steppe, steppe, mountain meadow-steppe, subalpine, and alpine zones extending from 500 to 3,400 m, encompassing 20 distinct grassland segments.

The study used satellite imagery from the MODIS, Sentinel-2, and PlanetScope satellite systems, covering the entire growing season on the volcanic massif over several years. To analyze land cover and vegetation characteristics, five vegetation indices were calculated from satellite imagery: NDVI, GNDVI, GLI, SAVI, and GSAVI, which reflect vegetation state by high-altitudinal zones. In situ measurements were also collected to validate remote sensing data. In addition, climatic variables (precipitation, soil temperature, and air temperature) were incorporated to interpret observed changes in the context of climate change.

Besides, grazing regimes provided by local self-government authorities were used to assess anthropogenic pressure across different landscape zones. Vegetation condition and its spatiotemporal dynamics were evaluated for each landscape zone. Coupling these results with grazing regime information enabled the identification of landscape zones subject to overgrazing and insufficient grazing pressure.

The study traced the spatial and temporal patterns of vegetation distribution, above-ground phytomass volume, and local patterns in high-altitude conditions.



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**Thematic => Atmospheric Science and Climate
Change: Interactions, Impacts, and Emerging Insights**



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Exploring the Earth, Connecting Worlds



1004 - Spatial Variability Of Lightning Intensity Over The Mediterranean Sea Correlates With Seawater Properties

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The divergence of total alkalinity (TA) from conservation with salinity (S) and relatively acidic conditions (pH) in surface seawater was suggested to explain the high prevalence of lightning superbolts in the Mediterranean sea, North sea and upwelling regions of the oceans. In this study we tested the combined effects of changes in S, TA and pH of Mediterranean sea surface water on the intensity of laboratory generated electrical sparks, which are considered to be analogous to cloud to sea-surface intensity of lightning discharges. The experimental results were used to develop a multivariate linear equation (MLE) of Lightning Flash Intensity (LFI) as a function of S, TA/S and pH. This relation was validated with wintertime (DJF) LFI measurements along a Mediterranean sea zonal profile during the period 2009–2020 compared to corresponding climate model outputs of S, TA and pH. Based on the resulting MLE, the combined effects of climate change, ocean acidification and the damming of the Nile, may have increased LFI in the Levantine Sea by $16 \pm 14\%$ until now relative to the pre-Aswan Dam period. Furthermore, assuming that salinization and acidification of the Levantine Sea will continue at current trends, the LFI is predicted to increase by $25 \pm 13\%$ by the year 2050.



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3221 - Enhanced Dust Activity In Central Asia Since 1980 In Response To Desert Expansion And Environmental Change

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Central Asia is undergoing a notable expansion of arid landscapes, with desert areas advancing northward by over 100 kilometers since the 1980s. The shrinkage of the Aral and Caspian Seas has given rise to new, significant dust sources worldwide, contributing to heightened dust emissions and associated climatic effects. Nevertheless, the spatiotemporal evolution of the dust cycle in this region over recent decades remains underexplored under global warming, leaving gaps in understanding regarding dust transport pathways, spatial distribution, and deposition patterns. In this study, we integrate satellite observations with analyses of spatial grain-size gradients in loess deposits to reconstruct the regional dust cycle model. A large amount of dust aerosols originating from western deserts is transported eastward at upper atmospheric levels and primarily deposited in the piedmont zones of the Pamir Plateau and Tien Shan. Using multi-source remote sensing data (MERRA-2, MODIS, OMI, and TMOS), we assess dust deposition and loading across Central Asia and identify a marked intensification of the dust cycle since 1980—a trend that diverges from that observed in northwestern China, despite both regions experiencing widespread warming and wetting. We propose that rapidly expanding desert areas, likely influenced by land surface modifications, are a key driver of this intensified dust activity. Moreover, the enhanced dust emission may increase nutrient inputs to the North Pacific, potentially stimulating marine productivity and promoting atmospheric CO₂ drawdown. These findings provide new perspectives on future dust dynamics in Central Asia and their complex linkages with climate change. This study also highlights the value of integrating modern satellite observations with paleo-dust records to better understand regional aeolian processes



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Exploring the Earth, Connecting Worlds



**Thematic => Climate and Vegetation Dynamics in the
Eastern Mediterranean: Past, Present,
and Future**



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1194 - Climate Changes And Human Impact At Lake Burdur (Southwestern Türkiye) During The Last 4600 Years Evidence From Pollen Record

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Abstract

Background

In order to reconstruct Holocene environmental change in the Eastern Mediterranean, it is essential to understand the long-term interactions between climate variability, vegetation dynamics and human activity. This study examines how climatic factors and human land use have influenced vegetation patterns in the Burdur Basin in southwestern Turkey over the past 4,600 years.

Materials and Methods

A high-resolution pollen record from the sediments of Lake Burdur was analysed in order to reconstruct the history of vegetation and infer climate variability. Pollen-based quantitative climate reconstructions were performed for summer (MTWA) and winter (MTCO) temperatures, growing degree days (GDD0) and moisture conditions. Multivariate statistical analyses, including principal component analysis (PCA) and redundancy analysis (RDA), were then applied to assess the relationships between vegetation, climate variables and indicators of human impact.

Results

The vegetation was dominated by evergreen Mediterranean species, particularly *Quercus ilex*, *Pinus*, *Olea europaea* and *Juglans regia*. The presence of persistent *Cedrus libani* pollen indicates long-distance transport from the Taurus Mountains. The continuous and high abundance of cultivated and disturbance-related taxa (such as *Juglans*, *Olea europaea*, *Poaceae*, *Chenopodiaceae* and *Plantago lanceolata*-type) indicates sustained human influence. A marked increase in arboreal pollen, particularly from *Pinus*, around 2700 cal yr BP reflects a shift towards denser forest cover. Climate reconstructions reveal a gradual increase in summer temperatures, peaking at around 24 °C at approximately 2700 years BP, while winter temperatures remained relatively stable. After ~2500 cal yr BP, climatic variability intensified.

Conclusions

The results demonstrate that temperature was the primary driver of long-term vegetation change, with moisture availability modulating disturbance and land use intensity. Human activities increasingly interacted with climatic variability to influence landscape dynamics in the Burdur Basin during the late Holocene. This research was supported by Istanbul Technical University, Scientific Research Projects Coordination Unit (İTU BAP), with project number MGA-2021-42781.



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2265 - Vegetation History In Anatolia Over The Last 1000 Years

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Anatolia has experienced a highly dynamic vegetation history throughout the Quaternary due to pronounced climatic fluctuations. These long-term climate changes have substantially shaped the plant biodiversity of the region. Owing to its location at the intersection of the Euro-Siberian, Irano-Turanian, and Mediterranean phytogeographical regions, Anatolia is particularly sensitive to climatic variability.

Pollen datasets from İznik Lake in northwestern Anatolia, Aktaş Lake in northeastern Anatolia, Tecer and Nar lakes in Central Anatolia, and the Bereket Basin in southwestern Anatolia were obtained from the NEOTOMA Paleoecological Database in this study. Vegetation changes across Anatolia over the last 1000 years were investigated using five pollen records.

Fossil pollen records indicate that arboreal (woody) vegetation has generally remained dominant across much of Anatolia during the last millennium. In all study areas except İznik Lake, Pinus (pine) and deciduous Quercus (oak) taxa represent the principal woody components. In the İznik Lake basin, deciduous oaks are dominant, accompanied by Pinus, Olea (olive), and Fagus (beech). This assemblage reflects the relatively humid and mild climatic conditions of the Marmara Region. In the fossil pollen record from Aktaş Lake in northeastern Anatolia, the dominance of Pinus together with the presence of Picea (spruce) indicates forest vegetation under cooler and more humid conditions. Among non-arboreal (herbaceous) pollen taxa, Poaceae generally constitutes the most dominant group, whereas at Tecer Lake in Central Anatolia, Artemisia is the most abundant taxon, accompanied by Amaranthaceae and Poaceae. The results of this study reveal how vegetation has changed across different regions of Anatolia, particularly over the last 1000 years. The dominance of both arboreal and herbaceous plant taxa varies regionally.



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2619 - Late Holocene Vegetation History Of Lake Terkos (İstanbul Türkiye)

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Background

Pollen grains preserved in lake sediments reflect the composition of the surrounding vegetation at the time of deposition. Since vegetation responds sensitively to climatic parameters such as temperature and precipitation, pollen-based reconstructions provide proxies for identifying past climate variability and land-use changes. The research area is Lake Terkos, located in the Çatalca district of the Marmara Region, along the Black Sea coast, within the borders of İstanbul. Geographically, it lies between 41°20'39'' N latitude and 28°34'32'' E longitude. The lake's maximum depth is 9.5 meters, with an average water depth of 3.4 meters and a surface area of 32 km². This study aims to reconstruct vegetation changes in the vicinity of Lake Terkos during the Late Holocene based on high-resolution fossil pollen analyses of a single sediment core.

Material and Method

A total of 81 sediment samples were analyzed at 1-cm intervals in this study. The sediment samples were processed following standard fossil pollen preparation procedures, and pollen slides were prepared for each depth level. At least 500 terrestrial pollen grains were counted per sample. Local pollen assemblage zones (LPAZ) and the pollen diagram's construction were performed using TILIA.

Results

Arboreal pollen (AP) dominated the assemblages, with *Quercus cerris* type (deciduous oaks), *Quercus ilex* type (evergreen oaks), *Pinus*, *Juniperus*, *Carpinus orientalis*, *Carpinus betulus*, *Corylus*, *Ericaceae*, and *Fraxinus* representing the most abundant taxa. Among herbaceous taxa, the highest pollen percentages in the pollen diagram were recorded for *Artemisia*, *Asteraceae-Asteroideae*, *Poaceae*, *Amaranthaceae* and *Ambrosia*.

Conclusions

The pollen analyses provide new high-resolution insights into the Late Holocene vegetation history of Lake Terkos and its surrounding area. The pollen record from the sediment core indicates that vegetation around Lake Terkos was dominated by both deciduous and evergreen oak taxa between approximately 1900 and 150 years BP. During the last ~150 years, oak taxa show a marked decline, while *Pinus* has progressively increased to become the dominant component of the regional vegetation.

This research was financially supported by the TÜBİTAK BİDEB 2219 International Postdoctoral Research Fellowship Program.



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Exploring the Earth, Connecting Worlds



**Thematic => Earth Under Stress: Geographic
Approaches to Natural Hazards and Risk Reduction**



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1005 - The Great East Japan Earthquake And Railway Reconstruction The Experience Of The Sanriku Railway

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This paper examines the Sanriku Railway's recovery process following the Great East Japan Earthquake. The railway experienced significant damage, but it was subsequently reconstructed and resumed operations, thereby becoming a vital infrastructure for local residents. Furthermore, it delves into the imperative of formulating a reconstruction strategy in the wake of such a calamity. Japan experienced the Great East Japan Earthquake on March 11, 2011, resulting in human casualties reaching 20,000 dead and missing, along with estimated total property damage amounting to ¥16.9 trillion. The railway infrastructure sustained considerable damage from the seismic event and the subsequent tsunami. Among them, the Sanriku Railway, which operates along the Pacific coast, experienced significant damage, with the entire southern line and a portion of the northern line destroyed. The estimated cost of the repairs is approximately 10.8 billion yen. However, given the company's capital of only 300 million yen, the restoration of the damaged facilities was beyond its financial capacity. The execution of three phases of restoration work was only made possible by government support measures, ultimately resulting in the line's reopening three years later. This underscores the necessity for the government to establish recovery policies and implementable policy measures, alongside technical countermeasures such as earthquake- and tsunami-resistant construction methods, to address disasters that individual companies cannot handle alone.



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1435 - Mapping Gendered Vulnerability In Mountainous Terrain Using Gis

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Background/Hypothesis

Yangmingshan, Taipei, faces severe landslide and “traffic island” isolation risks due to volcanic geology and extreme rainfall. This study addresses the “gender blind spot” in current disaster governance, hypothesizing that physical hazards disproportionately impact the mobility and social spaces of the region’s high concentration of elderly female residents.

Materials and Methods

Using Geographic Information Systems (GIS), a multi-layered overlay analysis integrates physical hazards (debris flow, landslide zones, and narrow road segments) with socio-demographic data (elderly female density, “living alone” households). Institutional layers map formal shelters alongside non-formal resources like local temples and private wells. Furthermore, “female influence points”—including markets, school routes, and tourist farms—are digitized through participatory mapping to calibrate the model against actual female mobility patterns.

Results

GIS outputs identify critical spatial intersections where high-risk slope hazards overlap with primary female activity nodes. The mapping highlights specific road segments prone to “traffic island” effects, which threaten to isolate female caregivers and elderly populations during prolonged extreme weather events.

Conclusions

Visualizing the intersection of physical hazards and gendered social spaces is essential for correcting gender-blind disaster policies. These spatial findings establish a baseline for developing inclusive evacuation strategies and ensuring mountain-specific resources are allocated to meet the daily realities of vulnerable female populations.



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**Thematic => Free Economic Zones and Overseas
Zones and Investments along the BRI**



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1099 - Development Resilience Of China's Overseas Industrial Parks Quantitative Evaluation Key Influencing Factors And Policy Implications

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Amidst the complexities of the global landscape, risk prevention in overseas investment has become increasingly critical. Drawing on vulnerability theory, complex adaptive system theory and embedding theory, the paper quantitatively evaluated the development resilience of China's overseas industrial parks, deepening understanding of sustainable overseas investment development. By applying the Obstacle Degree Model and the Grey Correlation Analysis, we identified internal obstacles and external geo-environmental factors that influence the resilience of overseas industrial parks. This research thus provides valuable references for addressing complex challenges in the global investment landscape. The research reveals that: (1) The resilience of overseas parks encompasses four interrelated dimensions—economic, institutional, social, and infrastructural—and their interactions between these dimensions shape the overall resilience level. (2) The overall resilience of case parks falls in the medium-to-low range, which points to substantial potential for improvement. Among these dimensions, economic resilience is the strongest, followed by infrastructural and institutional resilience. Social resilience, however, is markedly underdeveloped, indicating that socio-cultural adaptability is a key constraint on the parks' overall resilience. (3) Resilience evolution is co-determined by internal factors (e.g., industrial clustering, investment attraction, management expertise) and external factors (e.g., host country's developmental context, governance quality, and economic dependence). External factors act via environmental vulnerability, whereas internal factors operate through the parks' own response capacity. (4) Based on the findings, this study proposes enhancement strategies for processing and manufacturing parks with varying levels of resilience. Parks with a relatively low comprehensive resilience have substantial room for improvement across all subsystems. Parks with moderate comprehensive resilience perform strongly in some subsystems, but constraints in specific ones limit their overall resilience potential. Parks with high comprehensive resilience have balanced resilience subsystems.



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1164 - Prospect And Progress Of Chinese Geography Since 1949

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The history of Chinese geographical thought constitutes an important intellectual foundation for understanding the formation, evolution, and localization of geography as a modern discipline in China. Only a few studies systematically focus on the development of Chinese geographical thoughts both in China and over the world, with existing scholarship often addressing specific periods, themes, or schools of thought in a fragmented manner rather than providing an integrated and longitudinal perspective. Drawing on an extensive retrieval of relevant literature and a comprehensive integrative synthesis, and situated within a systematic review of existing studies and historical context, this paper explores the development stages, achievements and prospects of Chinese geography. Firstly, it analyzes the formation and development of modern Chinese geographical thoughts, and summarizes the process of constructing the disciplinary system of modern Chinese geography and the academic achievements made. On this basis, it examines the development stages and progresses of Chinese geography since 1949. Finally, it analyzes and discusses the research directions and future development trends of Chinese physical geography, human geography and related interdisciplinary branches. Chinese geography not only serves national strategic needs, regional development policy, ecological civilization construction and other issues, but also has become a unique component of the global geographical discipline system, providing an important reference for building a diverse and coexisting global geographical discourse system.



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1242 - The Emergence Of Innovative Industrial Clusters In An Emerging Economy Turkey's Organized Industrial Areas (organize Sanayi Bölgeleri)

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In recent decades, two global trends have attracted much attention in the popular media and academic publications alike: innovation and emerging economies. The former is now widely recognized to be crucial for economic development.

Of the latter, the best know are the so-called BRICS (Brazil, Russia, India, China, South Africa). Following these, then, are what have been labelled as “the Next Eleven” or N-11 (Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, Philippines, Turkey, South Korea, Vietnam). Yet these two megatrends have rarely met in academic research, despite the fact that the benefits of non-price competition to developing countries have been pointed out decades ago. In other words: we know very well that innovation and emerging economies matter, but we know little of innovative activities in such economies.

Turkey is widely considered as one of the N-11 countries that is likely to rise to the ranks of developed economies in the near future. Turkey has followed an open, export led economic policy since the 1980s. One of the measures that Turkey has undertaken domestically, to encourage manufacturing industries, is the establishment of the so-called Organized Industrial Areas (Organize Sanayi Bölgeleri, OSB). These OSBs are geographical concentrations of industrial companies, which were established for urban planning and local development. The benefits of agglomeration for industries (especially when it comes to the dissemination of information) were known at the time the first OSBs were established, and many OSBs show at least some features of clusters, which in these days are seen as the most beneficial environment for innovation.

This study provides the first overview of innovative activities in Turkey's metal and engineering industries, using long time series of domestic patent data from 2000 to 2020. Both patents and utility models are included in the study. Furthermore, the type of innovation revealed by such data, product and process innovations, are discussed. The focus is on the innovative performance of companies located in OSBs. The purpose of the research is to find out whether relatively simple geographic agglomeration, mostly induced by government measures, can encourage innovation in the same way as more sophisticated clusters.



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1284 - Spatio Temporal Evolution Of Chinese Overseas Parks In Southeast Asia And Influencing Factors Of Location

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With the acceleration of economic globalization and regional economic integration, overseas parks have become a necessary driving force for Chinese enterprises to ‘go out’ and an important platform to promote China’s global industrial layout. This paper focuses on 35 Chinese overseas parks in Southeast Asia, analyzes the temporal evolution and spatial agglomeration characteristics of overseas parks by kernel density method, and studies the influencing factors of location selection of overseas parks by multivariate logistic regression method. The results show that : (1) From the perspective of time series, the development of overseas parks in Southeast Asia has gone through three stages : germination stage, development stage and high-speed development stage. The industrial sectors of the parks basically include all types of free economic zones, such as trade free economic zone, agricultural free economic zone, manufacturing free economic zone, science and technology free economic zone, service free economic zone and comprehensive free economic zone. (2) From the perspective of spatial pattern, 35 overseas parks show obvious spatial agglomeration, mainly concentrated in southwest Vietnam and southeast Cambodia ; (3) Different parks have different location choice factors. In general, geographical location and political and cultural relations have great influence on the location choice of overseas parks, while economic relations have little influence. Finally, from the perspective of the state and enterprises for the development of the park made two suggestions : First, between the government to establish a good communication and coordination mechanism ; second, enterprises in the construction or selection of industrial parks should affect the type of factors to examine the host country ‘s investment environment, comprehensive evaluation to achieve long-term, high-yield development of the park.



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2081 - Beyond Enclaves The Dynamic Role Of Chinese Overseas Industrial Parks In African Economic Development

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As a key vehicle within the South–South cooperation framework, Chinese Overseas Industrial Parks (OIPs) remain the subject of significant debate regarding their impact on host country’s economic development. Focusing on the relational characteristics and dynamic effects of OIPs, this paper systematically examines their economic impacts, driving factors, and evolutionary mechanisms by leveraging panel data from 54 African countries spanning 2003 to 2023, combined with a multi-period difference-in-differences (DID) model and field-based case studies. The findings reveal that Chinese OIPs exert a significant and sustained positive effect on African economic development. Crucially, this effect is contingent upon pre-existing bilateral institutional, cultural, and socio-relational linkages between China and African host countries, while being further amplified when park strategies align closely with the developmental and industrial priorities of both sides. Dynamic analysis uncovers a phased pattern in OIPs’ economic influence: within the first decade after establishment, OIPs primarily generate direct investment effects through bilateral trade and infrastructure projects; beyond ten years, they produce indirect catalytic effects via the transfer and diffusion of Special Economic Zone policies. However, their long-term contribution to structural upgrading remains relatively limited. By situating OIPs within a “Home–Park–Host” triadic relational framework, this study underscores that their effectiveness is rooted not merely in unilateral locational advantages or park-level design, but fundamentally in the quality and depth of Sino-African reciprocal engagement, which offers new empirical insights into strategic coupling and policy mobility processes in South–South cooperation.



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2578 - Navigating The “two Countries Twin Parks” Model Pathways To Successful Cross Border Cooperation

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As an innovative mode of China’s foreign direct investment, China’s overseas industrial parks are not only the main content of the Belt and Road Initiative (BRI) but also the practical carrier of policy transfer. However, most of the academic literature on the policy transfer of overseas industrial parks has regarded the host country as a passive learner and seldom considers the two-way interactions between the host country and the home country. Using the Malaysia-China Kuantan Industrial Park (MCKIP) and the “Two Countries, Twin Parks” model as case studies, we discuss the applicability and innovative development of the policy transfer theory of China’s overseas industrial parks under the background of BRI. This article systematically analyzes the developmental background of the MCKIP and the cooperative framework between the governments. We consider the problems encountered in the policy transfer process and the solutions, as well as the two-way interactions between China and Malaysia in terms of the flow of people, logistics, capital, information, and technology. The case of the MCKIP shows that it is appropriate to analyze the policy transfer theory in the context of the BRI, but on this basis, it is necessary to use the scale reconstruction theory to solve the problems encountered in the process of the policy transfer of China’s overseas industrial parks. The research of this paper will help enrich the scale research of policy transfer. It can also shed enlightenment on the construction of “Two Countries, Twin Parks” overseas industrial park.



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Thematic => Geodiversity From Geographical Perspectives



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1153 - Mediverseaty The Human Dimension Of Marine Geodiverseaty In The Mediterranean

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Geodiversity is increasingly recognised as a key component of environmental sustainability and geographical inquiry. In marine contexts, however, geodiversity is still predominantly framed through physical and biological features, while human dimensions remain marginal. This contribution is grounded in the HORIZON-MSCA-2022 MEDiverSEAty doctoral network and proposes that Mediterranean marine geodiversity can only be fully understood by integrating human and biological dimensions within a relational geographical framework. MEDiverSEAty is explicitly built on two key pillars—Ocean Literacy and Marine Biodiversity Conservation—designed to overcome persistent divides between biological sciences, humanities, social sciences and environmental governance.

The contribution draws on the collective research of 10 PhD candidates working across six Mediterranean countries within an interdisciplinary and intersectoral training framework. It combines comparative qualitative case studies, interdisciplinary doctoral projects and analysis of educational and policy practices. Particular attention is given to social representations of the sea and to how “diversity” is conceptualised and communicated in scientific, educational and governance contexts.

Findings highlight widespread simplifications and misconceptions in public and institutional understandings of marine environments, where biological diversity is often disconnected from social practices and territorial dynamics. By mobilising its two core pillars, MEDiverSEAty shows that marine geodiversity emerges as a co-produced assemblage shaped by ecological processes, knowledge systems, education and power relations. The coordinated work of the 10 PhD researchers contributes to the development of a shared theoretical framework that repositions human dimensions as central to marine biodiversity conservation.

The contribution argues for an expanded geographical perspective on marine geodiversity that places biodiversity at the core of Mediterranean ocean literacy. MEDiverSEAty demonstrates how integrating human and biological dimensions supports a transition towards Marine Biodiversity Literacy, strengthening the role of geography in sustainable marine conservation and governance.



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1453 - Palynology And Biogeography Of Subtropical Mangroves In Hong Kong

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Mangroves are foundation species in tropical and subtropical coastal ecosystems, and they also offer important ecosystem services such as storm surge protection and carbon sequestration. Eight species of mangroves are present in Hong Kong, with their populations occurring discontinuously in different coastal wetlands. We investigated the vegetation structure and spatial composition of Hong Kong's largest mangrove community at Mai Po by conducting high-resolution remote sensing survey using LiDAR mounted on drones. The LiDAR images reveal two main canopy layers dominated by shrubby (1-2 m) *Acanthus ilicifolius* in the understory and an upper canopy (5-6 m) dominated by *Kandelia obovata* trees with some *Avicennia marina*. Scattered individuals of *Sonneratia apetala*, an exotic species spreading from Shenzhen across the bay, may occur as tall trees (15-16 m) protruding above the canopy. Little is known about the Holocene history of mangroves in Mai Po or other wetlands in Hong Kong. We have conducted the first palynological study of coastal wetlands in Hong Kong to reconstruct the population dynamics of mangroves in response to Holocene coastal environmental changes. Forty-nine soil surface samples were collected across the Mai Po wetlands to establish the modern pollen rain of the mangrove communities, and the pollen signatures of the surface samples will be quantitatively compared with the local vegetation composition determined from the LiDAR data. A 3.7 m sediment core has been collected from the mangrove wetland in Tai O in the southwestern part of Hong Kong for palynological analysis. More cores will be collected from Tai O, Mai Po, and other coastal wetlands to comprehensively reconstruct the Holocene history of mangroves in Hong Kong.



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1822 - Introduction To The Session Geodiversity From Geographical Perspectives

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6th October is the International Geodiversity Day proclaimed by UNESCO in 2021 for a worldwide celebration bringing people together to promote the very many aspects of geodiversity. IGU supported it strongly from its start, and established a Geodiversity Group in order to enhance awareness of this important international day, to highlight the significance of geodiversity in various ways, and to explore broad geographical perspectives on geodiversity. The Group held its first open seminar on geodiversity in 2023 in hybrid format (at Delhi University & online); the second one (2024) was held online hosted by Institute of Hydrobiology, Chinese Academy of Sciences Wuhan; and the third one (2025) was held online hosted by the University of Tokyo. The present session at Istanbul Regional Conference 2026 is intended to boost the wide-ranging academic dialogue on the above issues by intensive on-site paper sessions and poster sessions, which haven't been possible till today, and to contribute to the promotion of the International Geodiversity Day. The Session welcomes contributions from all the disciplines of geography, including physical geography, geomorphology, biogeography, human geography, social geography, cultural geography, economic geography, GIS, geography education, and environmental sciences, and anyone interested in geodiversity in geographical perspectives. It is noted that geodiversity is not only at geoparks or national parks, but is everywhere around us.



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2320 - How To Visualize “what Is A Geopark ”

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The aim of this study is to identify how the concept of Geoparks has been visualised. This study examines cases from Japan and other countries around the world.

First, definitions and descriptions of Geoparks are compared. Then, the concepts of UNESCO Global Geoparks and Japanese Geoparks, including academic papers and official websites of individual geoparks, are examined to explore how they have been visualised. In most academic papers, the nature of geoparks tends to be described as the intersection of different concepts and activities and as a process of community improvement. In developing regions with emerging geopark initiatives, illustrations tend to depict geoparks as a means for future community and social development, contrasting with approaches seen in Europe or China where activities are more established.

However, the concept of a geopark is often not effectively visualised on many geopark websites. They simply provide a definition of a geopark in the form of text and a logo or display pictures of their region. Those explaining the concept attempt to visualise and communicate geopark initiatives in their area.

In Japan, on the other hand, stakeholders emphasize that a geopark is not merely a “geological park.” This perspective has driven efforts to visualise the broader meaning of “geo,” leading to the popularisation of pyramid charts.

Geoparks are characterised as areas where “geo” is presented in a fun and easy-to-understand way. It is crucial to further discuss how to effectively visualise “geo” to enhance public understanding of its significance.



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2532 - Karst Geodiversity And Management In Indonesia

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Karst areas in Indonesia are spread across almost all islands, covering eight percent of the land area. This study aims to identify the geo-diversity of karst areas and their management. The geo-diversity analyzed includes rock formations, geological structures, and morphology. Data on rock formations, structures, and morphology were obtained from existing literature. Management data is obtained from applicable laws and regulations and management practices in each karst area and region. Indonesia hosts extensive limestone deposits formed across a wide range of geological ages and tectonic settings. Because the archipelago lies in an active convergent zone, its carbonates record environments ranging from shallow marine platforms to deep-marine slopes, later uplifted to form today's rugged karst. Paleozoic–Mesozoic limestone-derived Gondwana fragment. Younger rocks were formed by tectonic activity during the Cenozoic era, driven by the collision of the Australian plate to the south, the Pacific plate to the east, and the Eurasian plate to the west. These limestone formations currently exhibit a highly varied karst morphology, ranging from ridges to cones and towers. In more detail, karst morphology is also determined by the area's geological structure, which shapes morphological variations. To protect and manage the geodiversity of karst areas in Indonesia, the government has issued several laws and regulations. Eleven karst areas have now been designated as geological reserves, which are part of the national protected area. In addition to being designated as protected areas, five karst areas in Indonesia have been designated as UNESCO Global Geoparks, either entirely or partially.



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**Thematic => Geographical Indications and Regional
Development: Strengthening Local Identities and
Sustainability**



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1081 - Brewing Terroir Microbial Knowledge And Fermentation Practices In Taiwan's Specialty Coffee

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I mobilize 'brewing' as both a literal process and an analytical metaphor—while coffee fermentation literally brews flavor compounds through microbial action, terroir itself is being 'brewed' through emerging human-microbial collaborations. Taiwan's coffee industry produces approximately 1,000 tons annually, positioning itself as a boutique specialty producer rather than a volume competitor. Drawing on more-than-human geography and knowledge geography frameworks, this study examines how scientific microbial knowledge is entering this nascent industry, challenging traditional understanding of terroir as a passively inherited environmental gift and revealing flavor as increasingly cultivable achievement through deliberate multispecies partnerships.

This research combines cupping analysis of Taiwan specialty coffees from diverse regions and altitudes to establish geographic flavor patterns, in-depth interviews with a post-processor whose microbial intervention—analyzing local soil microbiomes and strategically selecting bacterial strains for controlled fermentation—resulted in championship recognition, and interviews with coffee farmers transitioning toward microbial-informed practices.

Cupping analysis reveals flavor clustering by administrative region and altitude, demonstrating how Taiwan's specialty coffee geography is currently understood through environmental frameworks—terroir as naturally given. Against this conventional mapping, the championship case illustrates how post-processors can function as 'microbial translators' who mobilize scientific understanding to intervene in fermentation processes, transforming invisible microbial labor into competitive distinction.

This study captures a nascent epistemological shift in terroir production—from environmental determinism toward more-than-human craftsmanship. It reveals how emerging microbial knowledge reconfigures relationships between place, expertise, and value in specialty agriculture, demonstrating how small-scale producers cultivate competitive distinction through orchestrating multispecies collaborations and translating scientific microbial understanding into deliberately crafted geographic characteristics.



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1288 - Geographical Indications Producer Cooperation And Territorial Development The Case Of Pdo And Pgi Schemes In Slovenia

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Despite being inherently rooted in territory, resources, and place-based identity, geographical indications (GIs) have attracted surprisingly limited attention within human and rural geography. This paper addresses this gap by approaching GIs as territorial governance instruments, rather than merely legal or marketing tools. In the European Union, GIs are implemented mainly through Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) schemes, which link product quality and reputation to a defined geographical area and specific production practices. The central hypothesis is that PDO and PGI schemes strengthen producer cooperation and territorial development only where pre-existing social capital and governance capacity are present.

The study is based on qualitative research conducted in Slovenia. Data were collected through semi-structured interviews with food producers, representatives of producer organisations, and other key stakeholders involved in PDO and PGI schemes. The material was analysed using qualitative coding, focusing on cooperation practices, organisational structures, stakeholder relations, and governance arrangements. Methods commonly applied in rural geography and territorial development research proved particularly effective for capturing the spatial and institutional dimensions of GIs.

The findings indicate that PDO and PGI schemes can positively influence cooperation in regions with strong traditions of collective action, especially in wine-producing areas. Here, producers benefit from joint marketing, shared resources, and knowledge exchange. In contrast, in regions characterised by historical distrust towards collective organisation, cooperation remains limited, reducing the schemes' market and territorial impacts. A key constraint is the fragmentation of governance, as Slovenia lacks a centralised support system to assist producers in managing PDO and PGI schemes.

The study shows that the effectiveness of PDO and PGI schemes depends strongly on territorial context, stakeholder governance, and social relations. Strengthening coordination, supporting local governance capacities, and fostering trust among producers are essential to unlock the full territorial development potential of geographical indications.



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1500 - Analysis Of The Spatiotemporal Evolution Characteristics And Driving Forces Of Chinese Geographical Indication Agricultural Products

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Agricultural Geographical Indications (AGIs) serve as a pivotal institutional tool linking natural endowments with rural revitalization; however, their fine-scale spatial patterns and multi-level driving mechanisms remain insufficiently understood. Based on data from 3,510 AGIs in China spanning 2008-2022, this study constructs a high-precision spatiotemporal database covering 43,655 townships. By employing the Theil index and the optimal Geodetector within a multi-scale framework—comprising the national level, three major geographical belts, eight comprehensive economic zones, and provincial units—this study systematically reveals the spatiotemporal evolution and spatial differentiation of driving factors. The results indicate that: (1) In terms of spatiotemporal evolution, AGIs exhibit a structure dominated by crop farming, with fruits and vegetables accounting for the highest proportion. New registrations show a phased trajectory characterized by “fluctuating growth, peaking in 2020, followed by a decline”. Spatially, a pattern of “widespread distribution coexisting with clustering in specific ecological zones” is observed, where different categories demonstrate differentiated “terroir-market” coupling dynamics. (2) Regarding regional disparities, a significant spatial imbalance exists in AGI distribution, and the sources of inequality are scale-dependent. In the Eastern and Western regions, overall disparity primarily stems from inter-regional structural differentiation (between-group contribution), whereas in the Central region, it mainly arises from intra-regional differentiation among counties (within-group contribution). (3) Regarding driving mechanisms, significant spatial stratified heterogeneity and scale effects are identified. As spatial units become more refined (downscaling from national to provincial levels), the explanatory power (q-value) of core factors shows a notable increasing trend. Dominant mechanisms vary distinctly across regions: the East is driven by “hydro-thermal conditions and agricultural inputs”; the Central region is dominated by “population–transportation–economy” factors; and the West is constrained by a combination of “natural endowments (soil/topography) and development levels.” This study confirms the scale dependence of AGI distribution mechanisms, suggesting that differentiated, zone-specific governance strategies are superior to uniform national policies.



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1932 - The Role Of Geographical Indications In Territorial Branding Sustainable And Resilient Development Of Russian Regions

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In Russia, the introduction of geographical indications (GIs) and names of places of origin (NPOs) is fragmentary. They have been registered since 2020 in accordance with Part Four of the Civil Code. By the end of 2025, more than 300 GIs and NPO in 80 regions were registered by the Federal Service for Intellectual Property (Rospatent).

There are a lot of cases that confirm systematic support of GIs and NPOs by regional governments. Thus, in the Krasnodar Krai, in what 15 GIs and NPOs have been registered, the Kuban has acquired not just a legal status, but a full-fledged regional brand that is used in agricultural policy, marketing campaigns, exhibitions and even educational programs. Such trademarks as Tula gingerbread, Belevskaya pastila, and Belevsky marshmallow are registered in the Tula Oblast. Many tours, workshops, excursions and other tourist events are held in the region.

Although, in most regions such programs are either not implemented at all or limited to the registration of GIs without further promotion.

The programs supporting regional brands have been approved in 36 of Russia's 89 regions. To objectively assess the effectiveness of these programs a model based on a systematic approach was created. It includes both quantitative and qualitative components. Direct effects reflect changes in key economic indicators related to the production and sale of products of GIs and NPOs. Indirect effects include increased employment, the development of related industries, and an increase in the number of small and medium-sized enterprises. Intangible effects include strengthening the region's image, increasing consumer confidence, and preserving cultural heritage. Since they cannot be directly quantified, a point scale is used based on the analysis of mentions in the media, surveys of consumers and investors, and participation in ratings.

The overall effect of the regional brand support program is calculated as a weighted sum of all components.

The relevance of supporting regional brands, including GIs and NPOs, is determined by the need to stimulate regions to their sustainable and inclusive development.

The research was supported by the Russian Science Foundation, grant No. 25-18-00709 (<https://rscf.ru/en/project/25-18-00709/>).



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**Thematic => GIS, Climatic Parameters, Tourism,
Multifunctional Information System, Environmental
Risks**



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1524 - On Orbit Real Time Generalization Of Surface Anomalies Based On Graph Neural Networks

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To address the critical bottlenecks of limited data transmission bandwidth and constrained on-orbit processing resources in natural disaster warning systems, traditional cartographic generalization methods—reliant on complex rules and geometric traversals—struggle to meet the stringent real-time requirements of emergency response. This study proposes a novel framework for on-orbit real-time generalization of remote sensing imagery based on Graph Neural Networks (GNN). The framework first utilizes the SLIC superpixel segmentation algorithm to extract geographical boundaries, preserving the original geometric shapes of disaster areas, and constructs spatial adjacency graphs to represent complex topological relationships. Subsequently, the GraphSAGE (Graph Sample and Aggregate) deep learning model is introduced to transform the tedious “path searching” and “explicit rule aggregation” of traditional algorithms into an end-to-end feature learning and inference paradigm. By acquiring prior knowledge through ground-based training and migrating it to the satellite platform, automated aggregation and simplification of emergency event imagery are successfully achieved. Experimental results demonstrate that this method significantly compresses the number of geographic feature patches while effectively maintaining spatial semantic consistency and multi-scale visual characteristics. This approach marks a significant cognitive paradigm shift in remote sensing information processing, moving from “pixel computation” to “relation understanding.” Compared to traditional methods, this approach substantially enhances processing efficiency, providing essential technical support for on-orbit real-time mapping services and anomalous event early warning in resource-constrained environments.



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1835 - Landiff Land Cover Segmentation From Low Resolution Historical Labels Via Diffusion Models

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High-resolution (HR) land-cover segmentation is crucial for accurate environmental monitoring and effective global ecosystem governance. Although supervised learning has made significant progress, generating accurate HR labels remains challenging owing to the rapid evolution of HR imagery and scarcity of corresponding training labels. Denoising Diffusion Probabilistic Models (DDPMs) have recently emerged as a powerful generative paradigm that demonstrates exceptional performance in segmentation tasks. For this purpose, we propose LanDiff, a novel diffusion-based framework that generates HR land-cover labels using only HR images and low-resolution (LR) historical labels. LanDiff integrates two key components: Land-cover Information Extraction (LIE) branch and Diffusion branch. LIE branch leverages multi scale convolutional kernels with Context Anchor Attention (CAA) to extract fine-grained local features from HR images. Diffusion branch learns to reverse the noise-addition process from mask labels to random noise, guided by Image Semantic Guidance (ISG) module and Contextual Features Integrator (CFI) module. ISG module injects LIE branch-extracted features as semantic guidance into Diffusion branch. CFI module bridges the global contextual information of HR images with the semantic structure of LR labels. By jointly optimizing two branches, LanDiff effectively addresses the spatial-resolution mismatch between HR remote sensing images and existing LR land-cover products. Comparative experiments on the three popular datasets demonstrate that LanDiff outperforms nine state-of-the-art (SOTA) methods in both mIoU and F1-score. We anticipate that LanDiff will provide scientific basis for sustainable land cover label loop and establishes a foundation for large-scale land cover change monitoring.



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1974 - Real Time Remote Sensing Early Warning Knowledge Expression Of Earth's Surface Anomalies

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In order to achieve risk management and control for earth's surface anomalies such as natural disasters, environmental pollution, ecological damage, safety accidents and illegal development, it's necessary not only to early detection of earth's surface anomalies but also to provide early warning. Satellite remote sensing provides an effective approach for real-time early warning of earth's surface anomalies. However, current remote sensing data products only display the spatial distribution of the earth's surface anomalies and lack expression of the critical early warning semantic elements such as location, strength, impact, trend, etc. Therefore, based on thematic spatial and semantic information generated from remote sensing detection and diagnosis, this study addresses the early warning service needs under limited satellite resource conditions. Firstly, this method investigates an on-orbit real-time expression mechanism for early warning knowledge that balances expression quality, processing efficiency, and resource constraints. Then, a real-time cartographic generalization theory and method for raster data aimed at dual expression of imagery and text is proposed. Finally, the method system for adaptive on-orbit real-time expression of early warning knowledge, centered on 'semantic extraction – knowledge graph construction - text generation' is established. The methods proposed in this study address the problem of adaptive real-time expression of thematic spatial and attribute information for early warning knowledge under conditions of 'limited resources, strong integration, high efficiency, and multi-user demands'. This breaks through the technical bottleneck of on-orbit real-time expression of earth's surface anomaly remote sensing early warning knowledge under satellite resource constraints, providing scientific foundations and methodological support for achieving real-time, intelligent, and automated surface anomaly remote sensing early warning.



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2639 - Spatial Group Decision Support System In The Form Of A Geographic Information System Dashboard As An Effort For Integrated Decision Making Within A Region (malaria Case In The Health Sector)

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Background

The ultimate goal of GIS technology is to facilitate rapid, precise, and accurate decision-making. However, this is often one-sided, based solely on proprietary data without input from surrounding areas. In many cases, decisions are often one-sided and local in nature, even though these decisions may impact or be influenced by surrounding areas. This can lead to wasteful, inefficient, or even impactless decisions, possibly worsening the situation. In the case of malaria, the implementation of GSDSS in the form of a dashboard can serve as a platform for an integrated decision-making support system across regions and decision-makers.

Method

In developing the dashboard, available data must be integrated through a geographic information system, providing support for malaria management decisions. This includes various data needed for decision-making: malaria incidence data, data on the determination or revocation of malaria outbreaks, outbreak management, maps of physical malaria receptive areas, maps of physical malaria village receptive areas, malaria vulnerability model maps, administrative area maps, land cover maps, geological land system maps, NDVI maps, and temperature maps, all of which serve as dashboard data. This data can then be analyzed in accordance with malaria management guidelines, directly considering information obtained from surrounding areas, to generate policy recommendations.

Result

The final result is a dashboard that supports decision-making by each stakeholder. Its handling depends on the decisions of each administrative area, adjusting its budget, but activities must be aligned. The dashboard is intended to ensure that every stakeholder in each region has a clear understanding of what is happening and what is being done in their neighboring areas.

Conclusion

A dashboard-based SGDSS can help explain malaria incidence and implement active and passive outbreak control in an integrated manner through a spatial dashboard platform. The dashboard can be further developed nationally, given that the data sources are readily available in the national database and validated, making it generally applicable with some adjustments and modifications appropriate to the specific disease, its transmission model, and its management.



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Thematic => Historical Geography of East Asia



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1263 - The Formation And Development Of Guangfu Township On The East Taiwan Environment Ethnic And Regional Construction

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The Guangfu Township belongs to the Hualien River basin, separated from Fenglin Town by Matai'an River in the north, and bounded by the watershed of Hualien River and Xiuguluan River and Ruisui Township in the south. This area was originally the living area of the two major Amis tribes: Tafalong and Fata'an Society, and after the sugar industry operated by the Yamato Factory of Japanese colonization, it attracted Japanese and Han people to move in, and created economic development and population growth in the region. After WWII, the Yamato Factory was renamed to Hualien Port Sugar Factory, and the sugar industry continued to flourish, as well as the large-scale developable land in the East Taiwan, which also attracted the Fu Lao and Hakka groups from the west and north of Taiwan to migrate one after another. By the way, many mainlanders who came to Taiwan after the war, the population continued to grow, it was designated as an independent rural space, becoming the latest township to form in Hualien County.

This new rural space, from the perspective of regional environment, administrative divisions and ethnic distribution, is obviously still living in groups, and even the two largest settlements of the Amis people, Tafalong and Fata'an, have been in a hostile state since history. So far, although the social interactions between the two communities have been more frequent, they are still divided into groups and go their own way. The Yamato community, a Fujian settlement in the southern part of the countryside that migrated due to the development of sugar factories, shows a different social interaction model from the Amis society.

This project aims to discuss the ethnic and socio-economic development contexts of the Guangfu Township from the perspective of regional governance, and examine the relationship between the environment, ethnicity, and regional construction. Further analysis: Is the community of different ethnic groups and regional personalities in the region still forming a separated local society, or is it gradually shaped into a local society with a sense of place through the redistribution mechanism of "township" administration?



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1302 - Territorial Tenures In Early Modern Edo Environs Spatial Structures And Determinants

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Background and Hypothesis:

Existing scholarship has characterized the territorial distribution of Osaka's environs—Japan's early modern commercial center—as a concentric structure predicated on military defense considerations. Conversely, the spatial configuration of Edo's environs—modern-day Tokyo, the nation's political center—exhibits a complex intricacy whose underlying geographical rationale remains underexplored. This study aims to clarify the unique spatial structure and determinants of the territorial tenure of Edo's environs through a quantitative analysis of its historical transitions.

Materials and Methods:

This study focused on 632 villages situated within a 20-kilometer radius of Edo Castle (approximately 5 ri, corresponding to the Shogun's hawking grounds). We track the evolution of territorial tenure across four periods: 1592 (16th century), 1647 (17th century), 1703 (18th century), and 1830 (19th century). Tenure was categorized into the shogunal territory, daimyo domains and hatamoto fiefs, and temple and shrine estates. The data were primarily derived from Shinpen Musashi Fudoki Ko and Kansei Choshu Shokafu.

Results:

The spatial analysis identified distinct patterns for each tenure category.

- **Shogunal territory:** Concentrated in the eastern, southern, and northern alluvial plains, this distribution remained consistent from the 16th to 19th centuries. This stability reflects a strategic imperative for centralized shogunate management of water control of the major rivers.
- **Daimyo domains and hatamoto fiefs:** Distributed mainly on the western plateaus, these holdings peaked in the 17th century, before declining. The plateau topography allowed for irrigation management at the village level through smaller streams, thereby fostering autonomous governance by smaller lords.
- **Temple and shrine estates:** These holdings have consistently expanded in the plain areas along major highways, indicating a functional selection of logistically friendly locations to ensure the supply of rice and labor to maintain shogun mausoleums.

Conclusions:

In contrast to the defense-oriented concentricity of Osaka's environ, territorial tenure in Edo's vicinity was fundamentally prescribed by topographical conditions and agricultural water availability. This spatial structure evolved from a logic that prioritized the efficiency of water control administration and resource logistics, distinct from Osaka's military logic.



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1319 - Global Trade And The Transformation Of Urban Spatial Patterns In The Yangtze River Delta During The Ming–qing Period

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The Ming–Qing period represents a critical phase in the long-term transformation of regional societies in East Asia, during which urban systems were increasingly shaped by both local conditions and expanding global trade networks. Focusing on the Yangtze River Delta—one of the most economically dynamic regions in late imperial China—this paper examines changes in urban spatial patterns between the fifteenth and nineteenth centuries from a historical geography perspective. Based on historical GIS data, urban distributions are reconstructed for six benchmark years. Spatial analytical methods, including kernel density analysis, nearest-neighbor analysis, and standard deviational ellipses, are employed to identify changes in urban density, spatial orientation, and distribution patterns. The results show that during the Ming period, cities were primarily distributed along the coast and exhibited a near-random spatial pattern. In contrast, the Qing period demonstrates a dual spatial characteristic: nearest-neighbor analysis indicates a statistically significant dispersed pattern at the overall spatial level, while at the regional scale urban development became increasingly concentrated around the Taihu Lake region, forming a distinct inland-oriented spatial configuration. Drawing on Braudel’s concept of multiple temporalities, this paper argues that the observed transformation resulted from the interaction of long-term environmental constraints, mid-term political and economic restructuring, and short-term policy shifts related to maritime trade and state regulation. The expansion of global trade reshaped regional economic functions and local livelihoods, while institutional and technological changes reduced the restrictive role of natural conditions. By integrating spatial analysis with historical interpretation, this study contributes to a deeper understanding of how globalization influenced regional urban systems and local societies in early modern East Asia.



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1714 - Livelihoods And Mobility Of Craftsmen In Early Modern Japan A Case Study Of The Tokushima Domain In The Mid 17th Century

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The purpose of this paper is to clarify the livelihoods and mobility of craftsmen living in rural Japan during the early modern period.

While previous research on early modern Japanese farmers has clarified the diversity, complexity, and autonomy of their livelihoods, craftsmen have remained insufficiently studied, largely due to the scarcity and limitations of historical sources. Clarifying the livelihoods of craftsmen is essential for a comprehensive understanding of the livelihoods of local societies and for reexamining the secondary sector of the period from the perspective of its actors.

To address this issue, this paper examines the livelihoods and mobility of craftsmen in the mid-17th century from the perspectives of migration and life course. Methodologically, I employed Geographic Information Systems (GIS) to map and conduct a spatiotemporal analysis of individual movements recorded in the Munetsukechō (historical household survey records) of the Tokushima Domain.

The analysis reveals that in the local societies of the time, migration across regions was not uncommon, and there were also a certain number of cases of people moving beyond the boundaries of feudal domains. Focusing on craftsmen, distinctive migration patterns are identified, such as migration to and from towns and migration for apprenticeship to acquire skills. Migration to and from towns was particularly notable, and it was found that craftsmen and merchants accounted for a significant proportion of those moving to and from towns.

This paper presents an analysis of the Tokushima Domain as a case study and attempts to generalize the findings through a comparison with other regions of Japan.



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1784 - From Agriculture To Cultural Industries The Change In Livelihood Pattern In The Mountainous Regions Of Eastern China From The 10th To The 11th Century

Gengxuan Wu¹

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This article will explore the transformation of localized livelihood patterns in the mountainous regions of eastern China from the 10th to the 11th century. The livelihood patterns in Jianyang (建阳), a mountain city located in Fujian province, experienced a significant shift from agriculture to cultural industries due to alterations in national policies and local transportation conditions during this period. From the 10th to the 11th century, with the progressive refinement of China's imperial examination system, many scholars successfully pursued official careers through these examinations—a trend also evident in Jianyang. The emergence of the examinations as a new means of livelihood contributed to the rise of a local book-production industry in the region. To pass the exams, scholars needed to purchase reference books, which created an opportunity for Jianyang—a region previously constrained by poor soil and scarce arable land. Local prominent scholars who had passed the examinations authored such reference materials, while local mountain and forest resources supplied the essential raw materials for printing blocks, paper, and ink for book production. With improvements in transportation, Jianyang's location in the mountainous periphery of Fujian Province helped expand its book market, allowing its books to reach surrounding regions and even nationwide. Following this transition, Jianyang gained prominence for its cultural figures and book printing, becoming renowned in traditional China. Such a transformation of livelihoods is distinctive and characterized by unique local features within traditional Chinese society.



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2146 - Reconstructing The Material World Of Linzi Production And Social Practice In The Mencius (4th–3rd Century Bce)

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This study develops an innovative textual archaeology framework to reconstruct the historical geography of Linzi, capital of the Qi state, by systematically treating the Mencius as a coherent source of spatial and material data. The analysis integrates recently uncovered archaeological evidence—most notably from the identified precinct of the Jixia Academy at Linzi, which includes palace foundations, refined drainage systems, and deeply worn wheel ruts at the city gates—with textual records of production, markets, rituals, and daily life.

These material remains directly corroborate descriptions in the Mencius of Qi's "grand mansions with lofty gates" built to attract itinerant scholars, as well as accounts of well-connected thoroughfares linking the capital to its hinterlands. This dialogue between text and archaeology is further enriched by later historical texts such as the Shuijing Zhu and by surviving place-names, together forming a multi-layered evidentiary network.

Through this integrated approach, the research reconstructs Linzi's dual-core spatial organization, reflecting the coexistence of political centrality and economic diffusion. Documented cultural practices—including the noted phenomenon of "Chu people learning the Qi dialect"—illustrate the city's role as a hub of cross-regional exchange. The synthesis demonstrates how Linzi's material production, social spaces, and external connections jointly sustained Qi's political hegemony and cultural vitality in 4th–3rd century BCE East Asia.

By grounding textual analysis in spatially-specific archaeological contexts, this study offers a transferable methodological paradigm that bridges documentary historiography and spatial archaeology. It moves beyond conventional top-down models of early capitals, highlighting instead the dynamic co-construction of authority, economy, and culture in the formation of East Asian urban landscapes.



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Thematic => Landscapes of Fire: Interdisciplinary Perspectives on the Relationships Between Wildfire, Human Settlement and Cultural Heritage



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Exploring the Earth, Connecting Worlds



1245 - Vegetation Fire Susceptibility Mapping In The Middle East Using Geographically Weighted Random Forest Model

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Background/Hypothesis

Vegetation fires, shaped by complex biophysical and anthropogenic factors, are showing an increasing trend across many areas in the Middle East over the past two decades. While national-level fire susceptibility maps exist on national levels in some countries, there is a lack of attention to regional assessments that consider fire risk crossing national borders. This limitation is critical because even though the Middle East is dominated by dry ecosystems, the diversity of land cover and land use, climate, vegetation, and human activities is high, creating complex spatial heterogeneous effects on fire risk and intensity that classical statistical models often fail to capture.

Materials and Methods

This study addresses this gap by developing a regional fire susceptibility map for the Middle East (Turkey, Syria, Iraq, Iran, Lebanon, Israel, and Palestine). We use the Geographically Weighted Random Forest (GWRF) model, a machine learning method designed to explicitly examine spatial non-stationary and non-linear relationships between fire susceptibility and predictive variables. We train the model using a multi-source dataset, combining MODIS Burned Area and Active Fire products from 2017 to 2025, with Sentinel-2 vegetation indices, topography, population density, and fire weather variables, including temperature, precipitation, humidity, and wind speed.

Results

The approach shows the difference between GWRF, Random Forest, and Geographical Weighted Regression models. Compared with the traditional random forest models, GWRF captures the spatial heterogeneity of variable importance, showing how the influence of each variable on vegetation fire risk varies across the space.

Conclusions

The application of GWRF provides a high-resolution, localized understanding of fire regimes that is valuable for future fire management. These results enable decision-makers to tailor fire prevention and adaptation strategies to local drivers. Ultimately, the research findings can help to optimize the allocation of firefighting resources and enhance transboundary fire coordination across the Middle East.



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1698 - Assessing Land Use Conflicts In Post Fire Forest Areas Under Urban Expansion The Case Of Urla-seferihisar Türkiye

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The increasing frequency of forest fires in recent years has given rise to a number of debates, particularly about policies regarding the protection of forest areas and land use decisions in these areas. The fires, which frequently occur in forests and shrubland areas, also bring about changes in land cover. In addition to the problems related to the revitalisation of the post-fire areas, the question of what pressures these areas are subjected to is becoming increasingly critical, especially in the Mediterranean basin. The transformation of forest areas into urban development areas, such as tourism and settlement, necessitates the analysis of areas of conflict.

The study focuses on forest fire areas that occurred after 2020 in the Seferihisar district of İzmir province, to examine land use conflicts in the Urla-Seferihisar line, where development pressure has increased. In the present study, the Land Use Conflict Identification Strategy (LUCIS) model was adapted with regard to the spatial characteristics of the region and the scale of the study area. Within the scope of the model, suitability analyses focused on agriculture, conservation, and urban development were created by considering environmental (topography, soil, and vegetation etc.), spatial (accessibility, proximity to existing settlements, etc.), and legal-institutional constraints (short-medium-long distance protection areas, site areas, etc.) criteria. The analysis of forest fire areas was conducted utilising Google Earth Engine. Then, overlay analyses were conducted between fire-damaged areas and land-use conflict areas to guide the identification of areas where socio-economic pressures overlap. In this context, the study aims to identify forest areas vulnerable to existing and potential pressures from development, tourism, and energy investment before and after the fire; and to contribute to the discussion of spatial strategies and priorities for the protection of forest areas in terms of land use decisions and planning policies.



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2374 - Volcano Fires As A Distinct Hazard Case Studies From Indonesia And A Comparative Framework For Global Risk Assessment

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Volcanoes generate diverse hazards, yet eruption-induced wildfires (volcano-fires) remain underexamined and are often treated as incidental by-products. This study addresses that gap by reconstructing volcano-fire events in Indonesia and contrasting them with Japanese eruptive settings where fires are rare, to clarify when volcanic ignition escalates into sustained fire hazard and to develop a transferable hotspot-identification framework.

A multi-scalar approach was applied. Volcano-fire pathways were reconstructed using archival accounts, satellite observations, and meteorological data, then integrated with GIS-based mapping of vegetation/fuel structure, landscape configuration, settlement patterns, and wind fields around target volcanoes. Comparative analysis with Japan was used to test whether volcano-fires are governed primarily by eruptive magnitude or by coupled ecological–social conditions.

Indonesian case studies from Mount Merapi and Mount Lewotobi Laki-Laki reveal distinct ignition and propagation mechanisms. At Merapi, valley-confined pyroclastic density currents ignited forests and plantations, with subsequent fire spread extending beyond primary impact corridors. At Lewotobi, incandescent ballistic clasts and heavy tephra fall ignited nearby villages, highlighting how building materials, settlement density, and village siting shape ignition probability and fire growth. In both contexts, combustible vegetation mosaics and rural housing materials create structural pathways for fire propagation. In contrast, Japanese analogues indicate that higher ambient humidity, less flammable vegetation, and stringent fire-resistant construction practices suppress large-scale fire spread even under comparable eruptive energy inputs, supporting the interpretation of volcano-fires as contingent hazards rather than direct functions of eruption size.

Building on these findings, a schematic framework is proposed to identify volcano-fire hotspots by integrating eruptive style, fuel continuity, settlement characteristics, and meteorological controls, alongside practical mitigation options (fuel management, fire-resistant construction, and strengthened warning and response). Overall, the study establishes volcano-fires as a distinct, assessable hazard class and shows that eruptions may supply ignition, but landscape and settlement systems largely determine whether ignition becomes conflagration.



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2523 - Living On The Edges Spatial Analysis Of Wui (wildland Urban Interface) Fire Risk In Buldan Denizli

Cansu Duman¹

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In Mediterranean forest ecosystems, the cumulative pressure of climate change and urban sprawl has transformed fire regimes from purely biophysical events into complex socio-spatial threats. The primary objective of this study is to analyze the relative impacts of anthropogenic (land use, road networks, human density) and biophysical (climate, fuel load, canopy closure) drivers shaping wildfire risk in the Buldan district (Denizli), focusing on the major fire event of August 2025 that threatened urban settlements, through an integrated Wildland-Urban Interface (WUI) model. A multi-variate risk mapping methodology based on the integration of Remote Sensing (RS) and Geographic Information Systems (GIS) was employed. Initially, the 2010–2025 fire inventory and ignition causes of Buldan were spatially processed to identify historical patterns. Risk modeling involved overlapping fuel load and canopy closure data derived from General Directorate of Forestry (OGM) forest stand maps and 2025 land use map (generated via Landsat and Sentinel imagery) with buffer zones of roads and settlements representing human caused ignition probability. Additionally, acknowledging the critical role of climate in wildfire dynamics, KBDI (Keetch–Byram Drought Index) calculated from 2015–2025 meteorological data were integrated to assess climatic stress. Findings indicate that over 80% of historical ignition points are concentrated within 500 meters of road networks and WUI transition zones where human accessibility is high. Specifically, “Interface” and “Intermix” zones, where building density intersects with high-fuel vegetation, constitute the highest-risk “hotspots” due to the compound effect of anthropogenic pressure and intensifying drought stress. Consequently, it was determined that the primary determinant of fire risk in Buldan is anthropogenic pressure interacting with climatic factors. The study highlights the necessity of prioritizing human-centric strategies encompassing settlement patterns and transportation networks, rather than relying solely on silvicultural measures, for effective fire management in WUI zones.



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**Thematic => Re-Considering
Regional Geography**



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1513 - Encountering The Region Why Reconsider Regional Geography Now

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2.2 No one is born a researcher. And certainly, no one is born an expert. Regional Geography (RG) is the recorded history of our actions, and geography is the practice of interpreting those events in a local context.

In this presentation, as the session convener, I will use the following as material to discuss “Why reconsider Regional Geography now?” 1) a look back at my own personal involvement with the Region, 2) my involvement with the Region in the educational environment of my school education, and 3) my involvement with the Region methodically within the framework of research. In particular, in (3), I would like to touch upon how, in the process of understanding forest and wildlife conservation policies in India and Scotland from the perspective of their regional contexts, I encountered 1) how policy rationality was betrayed in the regional context, and 2) how “good” policies made regional solutions more difficult, and in the process, 3) how my “way of involvement” in fieldwork changed. The specific field I will introduce is the “region” around Nagarhole National Park in the Western Ghats, which straddles the states of Karnataka and Kerala in South India, where I have been conducting research intermittently since 2007.



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1600 - Regional Patterns And Disparities In Sustainable Development In India Insights From The Sdg National Indicator Framework 2024

Shivani Meena¹

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Abstract

The Sustainable Development Goals (SDGs) provide a comprehensive framework for achieving inclusive and sustainable development by integrating social, economic, and environmental dimensions. In India, the achievement of SDGs is strongly influenced by the country's geographical diversity and persistent regional disparities. This paper examines India's progress towards the SDGs from a spatial and regional perspective using official data published by the Ministry of Statistics and Programme Implementation (MoSPI), the nodal agency for monitoring SDG indicators in India. The study is based on secondary data derived from the Sustainable Development Goals National Indicator Framework (NIF) 2024, which comprises more than 300 indicators covering all 17 SDGs. A descriptive and comparative research methodology has been adopted to analyze inter-state and regional variations in key development indicators related to poverty, food security, health, education, gender equality, access to water and sanitation, energy availability, urban development, and environmental sustainability. Spatial interpretation through regional comparison and thematic mapping has been used to identify patterns of inequality and development imbalance across the country. The analysis reveals significant spatial disparities in SDG performance, persistent rural-urban divides and region-specific vulnerabilities, particularly in climatically sensitive and resource-deficient areas, continue to constrain uniform development. The findings highlight the role of physical environment, infrastructural accessibility, and socio-economic conditions in shaping regional development outcomes. The paper emphasizes the importance of Geographic Information Systems (GIS) and spatial analysis in SDG monitoring, as these tools enhance the visualization of regional disparities and support evidence-based policy formulation. It concludes that achieving the SDGs in India requires region-specific planning strategies and stronger integration of geographical perspectives into development policy and governance frameworks.



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1693 - A Constructivist Approach To Hydropolitics Regional Water Governance In The Fergana Valley (central Asia)

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Background/hypothesis

The Fergana Valley is shared between Kyrgyzstan, Tajikistan and Uzbekistan, and constitutes one of Central Asia's most densely populated regions. Although the valley is abundant in water resources, climate change and demographic growth have fuelled a "water wars" discourse that frames the valley as a site of future armed conflicts. Despite this alarming prediction, recent developments, including the 2025 Khujand Treaty, show instead a trend toward regional cooperation. Thus, this paper's main hypothesis is that constructivist approaches to hydropolitics and water governance offer a more accurate framework than hydro-hegemony for understanding the region, focusing on social production of regional identities and practices.

Materials and methods

This paper draws on a PhD project in human geography, combining extensive fieldwork in Kyrgyzstan and Uzbekistan, qualitative interviews with stakeholders and actors at multiple scales, document analysis and GIS spatial analysis of transboundary hydrosocial territories.

Results

Findings indicate that concepts such as neighbourhood, mutual respect and kinship ties play a decisive role in shaping cross-border water cooperation at various levels. Informal collective decision-making practices coexist with formal interstate mechanisms. These practices contribute to a bottom-up regionalisation of the valley, challenging state-centric analytical frameworks and revealing regional identity narratives that emphasise solidarity rather than competition or conflict.

Conclusions

In this sense, a constructivist approach highlights how the Fergana Valley functions as a region-in-the-making where hydropolitics contributes to regionalisation, regional identity, and institutional transformation. More broadly, the paper aims to demonstrate how regional geography can benefit from engaging with hydropolitical processes through a constructivist lens not only as sectoral policy issues, but as key arenas through which regions are built, practiced and imagined.



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2368 - Reconsidering Regional Geography Through Metageography And Peripheral Mobility Kim Chan Sam's World Travels As Connectivity Based Region Making

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This paper reconsiders regional geography as a metageographical practice by examining the world travel writings of Kim Chan-Sam (1926–2003), Korea's first global traveler and a pioneering geography educator. It argues that his travel narratives offer a connectivity-based mode of region-making that challenges Western- and great-power-centered metageographies.

Before the liberalization of overseas travel in South Korea in 1989, international mobility was strictly regulated by the state. Beginning in 1958, Kim Chan-Sam undertook unprecedented global journeys from a Cold War–era periphery at a time when travel abroad was inaccessible to most Koreans. Between the 1960s and 1970s, his travel books became national bestsellers and played a decisive role in shaping how Koreans imagined world regions beyond geopolitical hierarchies. Over more than three decades, his writings were continuously updated through repeated journeys across Asia, Africa, Europe, the Americas, and the South Pacific.

Situating Kim Chan-Sam within debates on peripheral mobility and Global South knowledge production, this study analyzes how regions are constructed through routes, encounters, and lived experiences rather than fixed territorial boundaries. While quantitative and GIS-based approaches have significantly advanced geographical analysis, the paper argues for a complementary re-engagement with regional narratives that foreground connectivity and mobility.

Methodologically, the paper applies a connectography-based framework—understood as an approach that interprets regions through networks, flows, and relational linkages—to a metageographical reading of Kim Chan-Sam's travel narratives. The findings are further applied to the regional classification system of a digital educational platform, demonstrating how historically grounded travel narratives can contribute to rethinking regional geography beyond static and state-centered worldviews.



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3192 - City Positionality In Supply Chain Network And Urban Carbon Emission Intensity Evidence From Listed Companies In China

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Background

A city's environmental performance is inextricably linked to its position within intercity economic networks. Carbon emission efficiency can be regarded as an emergent outcome of a dynamic and interconnected urban system. This study adopts the term city positionality, as measured by intercity supply chain networks of Chinese listed companies, to investigate the relationship between city positionality and urban carbon emission intensity.

Materials and Methods

Using 29,580 firm-level supplier-buyer transaction records aggregated to the prefecture-city level for the period 2008–2017, sourced from the China Stock Market & Accounting Research database, we constructed directed, weighted intercity supply chain networks. We calculated key network centrality metrics, including in-degree, out-degree, closeness, betweenness, eigenvector centrality, and clustering coefficient, to quantify each city's structural position. These measures are incorporated into the XGBoost model, utilising SHAP analysis to interpret feature importance and non-linear effects on carbon emission intensity.

Results

Results reveal a scale-free network dominated by key hubs such as Beijing, Shanghai, and Shenzhen, reflecting highly uneven connectivity. Cities with higher flow-oriented centrality (in-degree, out-degree, and closeness) tend to exhibit lower carbon emission intensity, benefiting from greater resource efficiency and knowledge flows. Moreover, non-linear patterns show that cities with initially low in-degree centrality may experience high carbon emission intensity but improve as their network authority grows.

Conclusions

This study reveals cities' positionality within supply chain networks and challenges atomistic perspectives on urban carbon emission intensity by emphasising the importance of networked geographies, thereby extending world city literature into environmental domains. This study found that securing strategic positions in the supply chain networks can improve cities' capabilities to reduce carbon emission intensity, thereby contributing to sustainable development outcomes. The findings offer actionable insights for policymakers seeking to foster low-carbon intercity collaborations, optimise supply chain structures, and advance sustainable urban development in the context of China's green transition.



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Thematic => Rediscovering Small Towns: Digitalisation and Typologies of Abandonment



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1093 - Smartstores In Rural Regions Of Germany—governance And Government Discourse On New Forms Of Food Supply Operations

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Digitization in retail beyond e-commerce has triggered innovative advances. A prime example of this is the development of autonomous stores and vending machines, which are expanding in number in rural regions of Germany and opening up new opportunities for providing basic supplies to the population in peripheral areas. This gives rise to opportunities and risks,

- a) Whether the store format, which is often operated as a cooperative model, will find social acceptance at the governance level of a rural community.
- b) What problems mayors face at the government level in attracting providers of autonomous stores.
- c) Whether this store format will find lasting acceptance and loyalty among customers.

The data collection is based on 25 expert interviews with mayors, planners, politicians, and entrepreneurs, as well as 13 focus group discussions with 60 local citizens in Schleswig-Holstein, Germany's northernmost state. The interviews were conducted between August and December 2025 in 15 rural communities that have experience with so-called smartstores or have focused their plans on opening a smartstore to secure their local food supply.

Experience to date shows that, in contrast to earlier village shops with sometimes limited loyalty to the village shopkeeper and limited opening hours, new forms of flexible and spontaneous shopping have become established. 24/7 opening hours and accelerated checkout through technical and cashless solutions are perceived positively across generations. The cooperative approach of these stores leads to the village store being seen as a project worthy of community protection. These experiences are already being observed by other rural communities and may lead to the reestablishment of village shops, some of which have not existed for decades.



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1097 - Italian Inner Areas And The Geographical Imaginaries Of Peripheral Urban Development

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The National Strategy for Inner Areas (Strategia nazionale per le aree interne) is an Italian policy developed in 2013 that aims to enhance the revitalisation of “remote” municipalities. These municipalities have been identified based on statistical indicators of inequality, size, and accessibility to basic public services. Over the years, various strategies have been implemented to mitigate the demographic decline and the territorial marginality of these areas, mainly by enhancing access to basic services (health, education, mobility) and by valorising environmental and cultural resources, for example, local landscapes and cultural heritage. The program has been further enhanced in the current 2021-2027 edition, thanks to European Funds and various resources connected to the post-COVID-19 national recovery plan, to reduce spatial disparities in the country. During the COVID-19 lockdown, popular discourses also emphasised the potential for redevelopment of inner areas, particularly thanks to remote working enabled by digital technologies. The paper explores the geographical conceptualisation and the geographical imaginary of “inner areas” in relation to spatial development. The geographical concept of “inner area” marks a disconnection from traditional imaginaries of Italian spatial disparities, commonly framed in terms of North-South and urban-rural divides, and proposes a much more complex and fragmented conceptualisation of spatial development. Specifically, it will be argued that the imaginary of “inner areas” destabilises and provincialises the conventional conceptualisation of time and space, including ideas of tradition, modernity, abandonment, and the future, allowing different sets of strategies and ways of intending urban development outside the logics, frame, and gaze of metropolitan thinking.



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2605 - Depopulation And Abandoned Settlements In Central Russia Identification And Spatial Characteristics

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The decline in agricultural production in post-Soviet Russia was, in fact, precipitated by the depopulation of rural areas during the preceding Soviet period. Social polarization led to the division of regions into southern, more populous and economically successful areas, and non-Chernozem regions of Central Russia with shrinking populations and subsidized agriculture. This paper examines the abandonment of settlements and rural resettlement using the example of the old settled regions of Central Russia, especially those outside the Moscow region, which are characterized by ongoing depopulation and a strong, ambiguous transformation of agriculture and rural areas.

Research on rural areas is also complicated by the lack of reliable data on population size, especially at the level of individual settlements and localities. Indicators of the permanent population in rural areas include people who live in cities for several months and do not include urban residents with summer homes, who increase the population several times over during the summer season.

The aim of the research was to develop algorithms for identifying and accounting for the actual population and the processes of settlement abandonment in small villages using remote sensing data. For this purpose, high resolution satellite images were used. In addition, statistical data were sampled to identify uninhabited settlements, villages with no permanent population, and villages with a population of less than 100 people. At the same time, ultra-high-resolution satellite images were used to identify direct and indirect signs of the actual population, as well as abandoned and overgrown agricultural land.

The main trend in the settlement structure in post-Soviet Russia is the increasing polarization of rural settlements, the growth in the number and proportion of small and abandoned villages, and the concentration of the population in large villages. At the same time, the number of medium-sized cottage settlements decreased most rapidly, mainly due to their transition to the small category. The latter increasingly became uninhabited.

The study identified not only abandoned and depopulating settlements, but also the main spatial features of their distribution, which are related to infrastructure factors and the overall settlement network.



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3171 - Challenging Narratives Of Homogeneity Using Pca And Cluster Analysis To Develop A Typology Of Key Towns In Ireland

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Small towns are increasingly recognised as critical to achieving balanced territorial development and regional cohesion, yet they are frequently treated in policy as a uniform category.

In Ireland, the designation of “Key Towns” under the National Planning Framework assigns these settlements a strategic growth role, despite limited empirical understanding of their diverse development trajectories. This paper challenges the assumption of homogeneity by developing a multidimensional typology of 24 Key Towns located outside metropolitan functional urban areas using 2022 census data. A comprehensive indicator framework is constructed to capture demographic structure, health, education, employment, housing, and transport accessibility. Principal Component Analysis identifies five dominant development dimensions explaining approximately 85% of the total variance, while K-means cluster analysis classifies towns into three distinct development pathways: commuter-linked growth towns, peripheral and tourism-based towns, and regional hubs in transition.

The results reveal that towns within the same administrative region often share fewer similarities than those in different regions, highlighting a significant mismatch between spatial policy designations and local development capacity. Rather than representing a single model of decline or growth, Key Towns display diverse and path-dependent trajectories shaped by their economic base, demographic profile, and connectivity. These findings demonstrate the limitations of one-size-fits-all regional strategies in a highly centralised governance context and show how typological approaches can provide an operational bridge between place-based policy principles and practical implementation. By offering a transferable methodological framework, the study contributes to international debates on small towns, regional inequality, and the localisation of cohesion policy.



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Thematic => Sustainable Futures and Inclusive Spaces: A Geographic Perspective on Global Developmental Disparities



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1599 - Spatial Disparities In Indigenous Ecological Knowledge And Sustainable Development Outcome A Comparative Study Of Meena And Sahariya Tribes At Tehsil Level In Baran District Rajasthan

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The indigenous ecological knowledge (IEK) is highly recognized as a key to sustainable development; however, in the Indian tribal communities its translation to improved well-being has remained uneven. This study analyses and examines the relationship between the indigenous ecological knowledge and the sustainable development outcomes with help of a comparative analysis of Sahariya (Particularly Vulnerable Tribal Group) and Meena tribes of Rajasthan from Baran district at the tehsil level. This study has been done using the primary field survey data secondary sources. This study has employed a mixed-method approach through integrating quantitative indices and with qualitative analysis. Intra district disparities has been analyzed for various indices like Indigenous Ecological Knowledge Index (IEKI), Sustainable Development Index (SDI), Livelihood Dependence Index (LDI), and Women's IEK Participation Index. The findings from this study have revealed a pronounced IEKI–SDI mismatch. Sahariya tribe dominated tehsils like Shahbad and Kishanganj are under the category of High IEKI–Low SDI, emphasizing a paradox wherein rich indigenous ecological knowledge and practices has not resulted into improved development outcomes levels because of governance deficits and weak institutional support. On the other hand, Meena tribe dominated tehsils like Baran, Atru and Antah, are in Low IEKI–High SDI category, indicating towards better access to infrastructure, markets, and welfare schemes led by state, which plays a more prominent role in constructing sustainable development than alone by indigenous knowledge. This study argus that there is a need to have strong inclusive institutions and governance support along with the rich indigenous knowledge along with strong participation of women, then only region can get holistically developed in line with sustainable development goals.

Keywords: Indigenous Ecological Knowledge; Livelihood Dependence; Women Participation; Sustainable Development



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3218 - Multiple Stressors And Biocultural Diversity Based Livelihood Resilience Insights For Policy And Practice

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Globally, Indigenous Peoples and Local Communities (IPLCs) have evolved rich ecological knowledge systems and cultural practices collectively termed biocultural diversity (BCD). Drawing on these biocultural resources, IPLCs have historically engaged in autonomous adaptation through incremental learning and collective action to cope with livelihood risks. However, this resilience is increasingly challenged by interacting stressors, including climate change, ecological degradation, socio-economic and institutional transformations, which undermine the biocultural resource base and thus weaken the adaptability and livelihood resilience of IPLCs. Although BCD is being recognized in global environmental policies (e.g., SDGs, IPCC and IPBES), the mechanisms through which it shapes livelihood resilience under multiple stressors remain insufficiently understood, limiting its effective integration into policy-making and livelihood interventions.

Guided by resilience theory, this study conducts a bibliometric analysis of 1,774 publications from the Web of Science database to systematically identify key stressors affecting BCD-based livelihood resilience and to synthesize adaptation strategies adopted by IPLCs, drawing on biocultural resources.

The results reveal a pronounced imbalance in the literature regarding both stressor sources and adaptation strategies: climate and ecological stressors are frequently discussed, whereas political and institutional stressors receive relatively limited attention. Among adaptation strategies, knowledge- and culture-based practices emerge as the most commonly reported responses. Co-occurrence analysis further shows an asymmetric distribution of “stressor–strategy” linkages, with strong coupling between climate stressors and knowledge-based strategies, while political and institutional stressors are rarely associated with specific adaptive responses. This suggests that existing research focuses primarily on environmental adaptation practices while paying less attention to the structural conditions that generate vulnerability. This study, therefore, calls for the establishment of clear and scalable indicator systems, as well as cross-scale institutional coordination mechanisms, to bridge the critical knowledge gap between stressor identification and adaptive practices, thereby facilitating a shift of BCD from policy discourse toward structural transformation in institutions and practice.



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Thematic => The Effects of Climate Change



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1316 - Multi Stage Compound Climate Extremes Accelerate Wheat Yield Losses Under Dynamic Phenological Shifts In China

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The escalating frequency and intensity of climate extremes pose a critical threat to global food security. While the impacts of growing-season weather on crop yields are widely recognized, traditional assessments often rely on static crop calendars and ignore the “harvest window”—the critical period between physiological maturity and actual harvest. Here, we utilize a high-resolution (1 km) dataset integrating dynamic phenology and daily meteorological forcing to quantify the impact of multi-dimensional climate hazards on wheat yields across China from 2000 to 2019. By employing a machine learning framework (XGBoost) to capture non-linear responses, we show that dynamic phenological shifts significantly alter the exposure of wheat to extreme heat, frost, and soil-moisture-related stresses. Our findings reveal that the pre-harvest window is a previously overlooked but vital determinant of yield stability; extreme waterlogging during this stage can lead to substantial losses by impeding mechanical harvest and inducing grain sprouting, particularly in southern production zones. Furthermore, we demonstrate that compound extremes, such as the transition from early-season drought to late-season flooding, exert a synergistic negative effect that far exceeds the sum of individual hazards. These results underscore the necessity of integrating real-time phenology and harvest-phase risks into climate adaptation strategies to safeguard national grain production in an increasingly volatile climate.

POSTER PRESENTATION



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2005 - Peri Urbanization And Ecosystem Benefits A Systemic View Of Flows And Places

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Background

Peri-urbanization, an increasingly common phenomenon in Latin America, including Colombia, involves the rapid expansion of cities into formerly rural territories, profoundly transforming ecosystems and jeopardizing the sustainability of these areas.

Hypothesis

Peri-urban spaces combine various land uses, presenting serious conflicts of interest between urban development and the conservation of natural resources. This generates pressure on strategic ecosystems, which are essential for providing ecosystem benefits in contexts of climate change and variability.

Methodologies

The proposed methodologies of Action Network Analysis, Systems Dynamics, and the identification of leverage points were developed in the following phases:

- Definition of the socio-ecological system under study, using the geographic information systems ArcGIS and Google Earth Engine, and characterization of the network of actors, considering the main archetypal actors based on secondary information.
- Identification of action situations that capture the emergence of the socio-ecological system.
- Creation of scenarios and future simulations based on the action situations, on which the case studies are developed, allowing for an understanding of the system's dynamics in the face of climatic events and the integration of climate adaptation into territorial management instruments.
- Strategies and recommendations regarding the system.

Results

The results reveal that, while peri-urban areas face environmental and climatic pressures, their adaptive response depends largely on institutional coherence, community participation, coordination among conservation initiatives, integration of sectoral policies, and recognition of the territory's cultural, productive, and ecological value.

Concrete actions and intervention points are proposed to strengthen long-term resilience and sustainability.

Conclusions

Analytical tools are provided to make the application of complex adaptive systems practical and contribute to decision-making by communities and environmental entities, enriching the debate on climate change adaptation and sustainability within the framework of climate change adaptation actions.



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Thematic => Transformation of the Urban Environment Through Geospatial AI: Rehabilitation, Prediction and Urban Comfort



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1869 - A Geo Ai Framework For Urban Leisure Venues A Systematic Review Of Data Methods And Implications For Sustainable Urbanism

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This review synthesizes the rapidly evolving integration of Geo-Artificial Intelligence (Geo-AI) in the study and planning of urban leisure venues—such as parks, plazas, greenways, and cultural spaces. By systematically analyzing recent literature, we examine how multimodal geospatial data (including satellite imagery, LiDAR, street-view photos, social media POIs, and mobile signaling data) are processed through AI techniques (e.g., computer vision, spatial-temporal modeling, and deep learning) to map, classify, and evaluate leisure environments at scale. The paper highlights three core contributions: (1) automated detection and functional characterization of leisure venues, enabling large-scale inventories and deficiency identification; (2) assessment of spatial equity, accessibility, and perceived comfort using human-AI hybrid approaches; and (3) predictive modeling of usage patterns and intervention impacts under future urban scenarios. We further critically discuss methodological challenges—such as data bias, algorithmic transparency, and the loss of contextual nuance—and emphasize the necessity of embedding community insight and participatory planning within Geo-AI workflows. Ultimately, this review argues that a thoughtfully integrated Geo-AI framework can significantly enhance evidence-based urban rehabilitation, fostering more livable, equitable, and resilient leisure landscapes. Of particular importance is the need to address ethical considerations in these automated systems to ensure responsible and equitable deployment. This synthesis aims to bridge academic research with practical planning, charting a course for future innovation in the field.



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2119 - Geospatial Artificial Intelligence Urban Comfort And Good Practices In Contemporary Urban Governance

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Urban comfort is increasingly framed as a strategic objective of contemporary urban governance, integrating quality of life, environmental conditions, accessibility and housing wellbeing. At the European level, geospatial artificial intelligence is being promoted as an enabling layer for transforming how cities manage housing, prioritise urban rehabilitation and monitor cumulative residential pressures. However, evidence from policy reports and applied research indicates that the contribution of AI to urban comfort depends less on technical sophistication than on the existence of robust governance frameworks and clearly defined good practices.

This contribution analyses good practices in the integration of geospatial AI into urban governance, with a particular focus on housing management, rehabilitation planning and the regulation of short-term rental housing. The research is based on a structured review of international literature, European policy frameworks and institutional reports, complemented by consultations with public administrations and semi-structured interviews with municipal technicians and experts from architecture, geography and legal studies. The analysis examines how AI-supported and geospatially enabled systems are being used to support residential monitoring, prioritise rehabilitation areas, improve the traceability of housing uses and strengthen compliance with regulatory frameworks.

The findings identify a set of transferable good practices, including cross-departmental data governance linking housing, urban planning, social services and energy policies; interoperable urban data platforms; and the use of predictive analytics and spatial monitoring as decision-support tools rather than automated decision-makers. Persistent challenges include data protection requirements, fragmented data ownership across administrative units, uneven technical capacity among local authorities and dependence on external technological providers. Overall, geospatial artificial intelligence emerges not as an end in itself but as a catalyst for evidence-based, adaptive and coordinated urban governance, supporting more effective housing management, targeted urban rehabilitation and improved urban comfort.



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C24.01-African Studies => Africa and Climate Change



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1748 - Patterns And Drivers Of African Carbon Recovery After Disturbance

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Climate extremes and persistent deforestation pose significant threats to Africa's vegetation carbon stocks. However, the patterns of aboveground carbon (AGC) loss, recovery, and their driving factors in Africa remain poorly understood. Here, we utilize low-frequency microwave satellite data to analyze AGC dynamics across Africa during 2010-2020. Results indicate a small net AGC increase of $+0.16 \pm 0.03$ PgC yr⁻¹ during the study period, composed of gross losses of -1.56 ± 0.26 PgC yr⁻¹ offset by gross gains of $+1.72 \pm 0.29$ PgC yr⁻¹. The total loss in forested areas amount to -0.50 ± 0.07 PgC yr⁻¹, of which degradation accounting for twice as much loss as deforestation. In non-forested areas, the total AGC loss was -1.06 ± 0.21 PgC yr⁻¹, primarily driven by wildfires (-0.78 PgC yr⁻¹). Following the 2015–2016 El Niño event, 66% of affected regions exhibited AGC recovery ratios exceeding 100% during 2015–2020, predominantly in non-forest vegetation, suggesting a higher recover ratio for non-forest vegetation. In contrast, the remaining 34% of regions did not fully recover, with an average recovery rate of 58%, predominantly concentrated in forested areas. A machine learning analysis based on random forest suggests that recovery ratios are primarily influenced by vapor pressure deficit (VPD), followed by precipitation and human footprint. Our study provides a comprehensive understanding of the dynamics of African AGC by distinguishing the loss into forest and non-forest vegetation, and also highlights the key drivers of AGC recovery after disturbances. These findings offer valuable insights for ecological conservation, climate adaptation, and global carbon budget assessments.



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C24.04-Biogeography and Biodiversity => The World's Mountains in the Anthropocene



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2785 - The Impact Of Mistletoe On Chemical Transformation Of Precipitation In Forests

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Background

Climate change affects health condition of forests in Central Europe. One of the factors is the expansion of mistletoe *Viscum album* – hemiparasitic plant, which can significantly alter water balance and chemistry of precipitation.

Materials and methods

The research was conducted on selected plots in coniferous and deciduous forests in Central Europe (Poland, Czech Republic). Quantity and chemical composition of precipitation, throughfall and stemflow on healthy and infested trees were analysed, with the use of IC (ICS6000 DIONEX, cations and anions) and ICP-MS/TOF (Optimass 9500 GBC, trace elements). The research was financed by the National Science Centre (contract number UMO-2023/51/I/NZ9/01813).

Results

On all the plots the concentration of ions was higher in throughfall and particularly in stemflow than in open-field precipitation. Throughfall and stemflow on infested trees had higher electrolytic conductivity than on healthy trees, both in the case of coniferous (*Abies alba*, *Pinus sylvestris*) and deciduous species (*Populus L.*). Chemical composition showed increased concentration of cations, such as potassium. In autumn and winter higher concentration of acidifying ions (sulphates and chlorides) and lower pH were noted, which could be connected to air pollution in the heating season.

Conclusions

Our results show that there is a need to include mistletoe in prognosing water balance and geochemical changes in forests. This factor can be particularly important due to climate change and increasing frequency of drought episodes.



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C24.05-Climatology => Extreme Weather and Climate Events: Causes, Consequences, and Impacts



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1411 - Geographical Dependent Model Tendency Error Estimation Based On Eakf Assimilation In An Intermediate Coupled Model

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El Niño-Southern Oscillation (ENSO), a core strong signal of interannual variations in short-term climate, exerts significant impacts on global temperature, precipitation, and the distribution of natural disasters. Its accurate simulation and effective prediction have long been a research focus in the atmospheric and oceanic fields. Although various ENSO prediction models have been developed internationally, they generally suffer from prediction biases. Particularly, the frequent occurrences of Central-Pacific (CP)-type El Niño events pose new challenges to model performance. Model error is a key factor restricting the improvement of prediction skills, among which the optimization of tendency error is crucial for enhancing long-term prediction capability. The Ensemble Kalman Filter (EnKF) has unique advantages in parameter estimation, such as simple calculation and capability of characterizing the dynamic evolution of errors, yet its application potential in ENSO model tendency error estimation remains underutilized.

Based on the Ensemble Adjustment Kalman Filter (EAKF), this study developed an ensemble coupled assimilation system to quantitatively estimate the ENSO model tendency error by assimilating sea surface temperature anomaly (SSTA) data. Results show that the estimated tendency error is in good agreement with the SSTA simulation error. Incorporating this tendency error into the model can effectively reduce the model systematic error and significantly improve the ENSO simulation accuracy. This study provides empirical evidence for expanding the application value of EnKF in ENSO prediction, and offers new ideas and technical support for optimizing ENSO model performance and improving short-term climate prediction level.



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1907 - Climatological Characteristics Of Droughts In The Philippines Prior To The Mid 20th Century

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Background: To understand recent climate change in Southeast Asia from a long-term perspective, it is essential to analyze meteorological data from before the mid-20th century—a period for which observations have long been sparse. This study aims to clarify the climatological characteristics of historical droughts in the Philippines and established a foundation for analyzing the frequency and variability of extreme weather events in Manila over more than a century.

Materials and Methods: This study used daily and monthly meteorological records (rainfall, temperature, surface wind, and sunshine duration) recovered through the authors' data rescue project. Although historical meteorological records in the Philippines were widely dispersed in paper form, we collected and digitized these materials, focusing particularly on Manila, where systematic observations were initiated by Spanish Jesuits in 1865. This effort enables analysis over a century, excluding several years with missing data.

Results: Our analysis identifies 1903 as the driest year between 1865 and 1939, with annual rainfall amounting to roughly 50% of the 1907–1939 average (a period with minimal data gaps). Relative to this baseline, rainfall in 1903 was markedly reduced during the peak rainy season (June–September), reaching only 45% of the average. Seasonal progression also exhibited notable anomalies: the onset of the southwest monsoon was delayed by about one month, which in turn delayed the onset of the rainy season and prolonged the dry season. As a result, sunshine duration increased from March to September, and high-temperature conditions persisted from April to June.

Conclusions: This study showed the impact of seasonal progression anomalies, particularly monsoon delays, on historical drought intensity. In this presentation, we extend this approach to other historical drought years and examine the intensity, frequency, and spatial patterns of droughts in the Philippines by using multi-station data from the early 20th century.

Acknowledgements: This research was supported by JSPS KAKENHI Grant number 23H00030 and 25K00552.



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2181 - Atmospheric Conditions That Drive Extreme Rainfall In Southeastern Southamerica

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Extreme rainfall over southeastern South America (SESA) results from the interaction between synoptic- and large-scale atmospheric processes. However, the climatic conditions that precede and persist after these events remain poorly understood. We hypothesize that the atmospheric patterns favoring extreme precipitation develop days before event onset and partially persist afterward. To test this hypothesis, we used precipitation data from the BRDW-GD and CPC datasets to identify extreme days, defined as those with rainfall above the 95th percentile over at least 10,000 km². An extreme event was defined as a continuous sequence of such days. Atmospheric conditions were analyzed using ERA5 composites for the period 1970–2024, covering three days before and up to two days after the end of each event. Results indicate that extreme rainfall in SESA is associated with large-scale atmospheric patterns that strengthen the Subtropical Jet (SJ) and enhance vertical air motion over the region. About three days before the events, there is a strong geopotential gradient between southeastern Pacific and southern South America. This gradient intensifies the upper-level zonal winds at 250 hPa, strengthening and shifting the SJ south of SESA. In this configuration, the jet exit region favors upward motion over SESA and combined with sufficient moisture, promotes deep convection and heavy rainfall. At lower levels, large-scale conditions organize the synoptic environment and enhance the transport of heat and moisture from tropical South America into SESA. About three days before the events, surface warming develops over Paraguay and intensifies while spreading into SESA on the day preceding the extremes. This warming is associated with the formation of a low-level cyclonic circulation and a decrease in mean sea level pressure. The resulting pressure gradient strengthens northerly moisture transport and low-level convergence over SESA. The combined influence of upper-level jet dynamics and low-level thermodynamic forcing leads to enhanced moisture and energy convergence, creating favorable conditions for intense convection and extreme precipitation. We conclude that SESA extremes emerge from a well-defined interaction between large-scale and synoptic-scale processes, although future studies should examine the diversity of atmospheric configurations and their impacts on the location and intensity of extreme rainfall.



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C24.05-Climatology => Impacts of Climate Change and Human Sphere Adaptation



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2757 - Contemporary Climate Changes In The North Caucasus (1960 2025)

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Global climate change is currently one of the most pressing issues facing our time, and has been the subject of numerous studies. Regional climate change research, particularly in the North Caucasus, is receiving considerable attention. The aim of this study is to identify the characteristics of regional climate change in the North Caucasus from 1960 to 2025. Key objectives: analyzing temperature and precipitation data from meteorological stations in the study region; identifying changes in the state of regional complexes in connection with current climate change; conducting a comparative analysis of changes in the region's landscape boundaries over recent decades; identifying the nature of landscape boundary shifts; and analyzing the temporal structure of landscapes. Materials and methods: reference and literary materials (including datasets from regional meteorological stations) available in the public domain, archive materials, and forecast scenarios for changes in the region's physical and geographical structure under possible global warming. GIS software packages were used to process the research results, including statistical processing. The following key results were obtained: analysis of winter and summer temperatures for the designated research period revealed a steady upward trend in temperature in the region (by 1.5-2.0 0C); a relatively slight upward trend in precipitation was observed in foothill semi-humid and steppe landscapes, while a decreasing trend in precipitation was observed in mountain and semi-desert landscapes; a decrease in precipitation was observed primarily in mountainous regions, especially in recent years; linear and polynomial trends in temperature, precipitation, and hydrothermal coefficient graphs constructed from the available data demonstrate a tendency toward temperature and precipitation change, as well as periods of increase and decrease in temperature and precipitation values.



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2771 - Anthropogenic Aerosols Identified As The Dominant Driver Of Recent Hadley Circulation Weakening

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Anthropogenic aerosols constitute a dominant yet distinctively uncertain component of the radiative forcing (IPCC, 2021). Unlike the globally ubiquitous warming signal driven by greenhouse gases, aerosol forcing is spatially confined and heterogeneous. Furthermore, aerosols exhibit non-linear interactions with greenhouse gases (Feichter et al., 2004), making their impact on large-scale atmospheric circulation difficult to isolate from internal climate variability.

In this study, we provide robust evidence that the anthropogenic aerosol forcing has emerged as the primary driver of the recent northern hemisphere (NH) Hadley circulation (HC) weakening. We provide a mechanism that reveals that the aerosol caused a distinct meridional asymmetry of the temperature change, the aerosol induced the cooling in the tropics against the relative warming in higher latitudes. This finding distinguishes the recent aerosol-driven weakening from the expected response to greenhouse gases (Held and Soden, 2006; Lionello et al., 2024), demonstrating that regional aerosol emission patterns can significantly modulate the strength of the planetary-scale circulation. While the heightened sensitivity of CMIP6 models to aerosols is well-established for the AMOC (Menary et al., 2020), the susceptibility of the HC has remained less constrained. Our analysis resolves this ambiguity by anchoring our results in observational AHT (Atmospheric Heat Transport) constraints and explicit K-E equation diagnostics to confirm that aerosol forcing has been the dominant architect of the recent circulation changes while greenhouse gases have played only a minor role.

Nevertheless, the exact magnitude of future HC weakening is subject to uncertainties regarding the net radiative effect of aerosols (Lionello et al., 2024). For example, although recent declines in aerosol emissions are thought to enhance the trend in Earth's energy imbalance (Hodnebrog et al., 2024), other studies indicate that the net aerosol contribution might be negligible due to compensatory increases in natural aerosols (e.g., wildfires and volcanoes) in the Southern Hemisphere (Park and Soden, 2025). Given this conflicting evidence, together with the persistent rise in greenhouse gases, future regional aerosol mitigation (e.g., in Asia), and the unpredictability of volcanic eruptions (Fyfe et al., 2021), the combined impact of these factors on the future HC weakening remains to be further investigated.



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C24.05-Climatology => Urban Climate



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1470 - The Impact Of Typhoon Events On Urban Thermal Comfort In Tokyo Metropolitan Area

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Background / Hypothesis

Recent climate change has increased the frequency and intensity of extreme heat events worldwide. In Japan's Kanto region (including Tokyo Metropolitan Area), the expansion of high-temperature zones driven by urban heat island effect poses serious risks to human thermal comfort. However, studies on thermal comfort impacts of extreme events in Japanese cities remain limited. In Japan, a sharp increase in heatstroke-related hospital admissions has been reported during extreme hot days especially after the passage of typhoons. Therefore, this study hypothesizes that typhoons significantly exacerbate thermal discomfort in urban areas.

Materials and Methods

Universal Thermal Climate Index (UTCI) from HiTiSEA dataset was used to assess thermal discomfort associated with typhoons over Kanto region. Land surface temperature (LST) data from Himawari-8 geostationary satellite were incorporated to characterize surface thermal conditions. UTCI differences before and after typhoon passage were quantitatively evaluated based on these datasets.

Results

Analysis of Typhoon Faxai (September, 2019) showed that both LST and UTCI increased after the passage. However, the LST increase was particularly significant in the vegetated Boso Peninsula and Saitama, likely due to decreased evapotranspiration caused by fallen trees and leaves due to the storm. On the other hand, UTCI showed an increase across the entire Kanto region. UTCI is an index calculated from four factors: temperature, humidity, wind speed, and radiation. The main factors are thought to be the rise in temperature and humidity due to the advection of warm air from the south associated with the typhoon, the increase in solar radiation due to clear conditions after the passage.

Conclusions

This study found that typhoons exacerbate urban thermal discomfort, as hypothesized. However, the UTCI used in this study has been shown to contain uncertainties and biases in Kanto region, so future research should examine whether alternative heat indices produce the same results.



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C24.08-Cultural Geography, Society and Heritage => Geographical Perspective on the Protection of Historical and Cultural Heritage



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1604 - Learning Remembering And Playing Social And Educational Perspectives On Traditional Sports And Games

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Traditional sports and games (TSGs) constitute an important segment of cultural heritage, formally recognised through the inclusion on UNESCO's Intangible Cultural Heritage (ICH) List. They create a vital element of Serbian cultural identity and were widely practised in the past. In response to the increasing risk of their disappearance, two national projects were implemented during 2023–2025 to raise awareness and knowledge among the local population. Projects focused on workshops for primary school students, where selected TSGs were demonstrated and performed by children. Additionally, surveys of children aged 10–14 and interviews with adults (70+ years old) were conducted. Results indicate that most children understand the basic meaning of the term but are unfamiliar with individual TSGs. Respondents most frequently recognised older athletic disciplines, such as the standing long jump (76.5%). Specific children's games, including “trule kobile” game (70.1%) and “between two fires” (74.9%), were also widely recognised. Knowledge of TSGs was transmitted primarily within the family, most often by parents (61%) and grandparents (55%). Most respondents (81.3%) couldn't identify the significant ICH in their municipality, indicating limited knowledge of this concept. Regarding gender relations, the majority agreed that boys and girls should participate in the same games (60.5%) and that girls should receive equal treatment in all TSGs (53%). Opinions on whether boys are stronger than girls in TSGs were divided, with 33% of neutral responses. Interviews with older respondents revealed that all participants recalled engaging in TSGs during their youth, including the “klis” game, tree climbing, the stone put, and the “krmačice” game. All respondents are locally native, with ancestral roots dating to early 19th-century immigration. Respondents indicated that participation in these activities declined over time, leading to their gradual disappearance. Although they were unfamiliar with the concept of ICH, the respondents expressed an attitude to revive TSGs.



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C24.08-Cultural Geography, Society and Heritage => Geographical Perspective on the Protection of Historical and Cultural Heritages



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1395 - A Study On Evaluation Urban Resilience In Tibet Autonomous Region From A Social Ecological Perspective

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This study based on the concept of Social-Ecological resilience, constructed an urban resilience evaluation system suitable for the Western Tibet Autonomous Region from five dimensions of ecology, economy, society, infrastructure, and institution, and used the entropy weight-TOPSIS method and obstacle model to explore the differences in urban resilience level and the main obstacle factors in 74 districts, counties and urban areas of the Tibet Autonomous Region. The research found that: 1) The level of urban resilience in the Tibet Autonomous Region presents a “spindle shaped” structure in terms of hierarchical distribution, with more in the middle and less in the two levels. 2) From the perspective of each region, the urban resilience level in the central region belongs to high value imbalance type; Northwest Tibet belongs to low value equilibrium type, while Eastern Tibet and border areas belong to general equilibrium theory type. 3) Among the various subsystems of urban resilience in the Tibet Autonomous Region, infrastructure resilience exhibits the strongest, while economic and social resilience are the weak. The ecological resilience, economic resilience, and infrastructure resilience of cities also face regional development imbalances. 4) From the perspective of the Tibet Autonomous Region as a whole and the four regions, the most significant obstacle factors affecting urban resilience in the Tibet Autonomous Region are economic factors, followed by institutional factors. The degree of influence of social soft factors such as education, healthcare, social organization, population structure and quality is higher than that of hard factors such as urban infrastructure. The main obstacle factors to the resilience of various cities in the Tibet Autonomous Region have homogeneous characteristics. The study can provide a basis support for the evaluation of urban resilience construction level, identification of urban development weaknesses, healthy and sustainable urban development, and high-quality urban construction in Tibet Autonomous Region.



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1448 - “emotion Rights Intervention” A New Interpretative Framework For The Sustainable Development And Governance Of Traditional Villages

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Against the background of rural revitalization, a comprehensive and systematic understanding of the underlying logic of the sustainable development of traditional villages has important theoretical value and practical significance. Based on the new interpretative framework of “Emotion-Rights-Intervention” (ERI), this study, taking national-level traditional villages as analysis cases, uses structural equation modeling (SEM) analysis to deeply reveal the logic and driving mechanism of the sustainable development of traditional villages. Research has found that: □ In the process of the sustainable development of traditional villages, ERI play key functional roles, with emotional drive becoming the deep internal potential for village development; the rights structure maintaining the orderly operation of rural organizational order; and intervention embedding being an important force in balancing external resources and internal demands; □ ERI directly have relevant impacts on village development; meanwhile, their complex symbiotic relationships, working together through a chain reaction in village development, produce partial mediating effects; □ Emotion, as an endogenous force, is a fundamental force that exerts implicit and lasting influence, while Rights and Intervention, which exhibit explicit strong force characteristics at present, work together and profoundly influence the evolution process of modern rural governance. Furthermore, the study, through the exploration of new theoretical explanations and real-world mapping and based on the dynamic equilibrium mechanism under the ERI framework, proposes the strategies and paths for the sustainable development of traditional villages.



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**C24.08-Cultural Geography, Society and Heritage =>
Global Science and the Geographies of Knowledge. 1.
From the Classroom to the Field: Negotiating Global
Norms and Local Practices in Geography.**



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1350 - Glocal Learning Exploring Global—local Awareness Through A Film Based Translation Project *Takako Ramsden*¹

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In an era characterized by intensified global flows of media, language, and culture, higher education is increasingly expected to foster learners who can engage with global resources while remaining sensitive to local contexts. Within geographical discussions of globalization and localization, translation can be understood as a situated practice through which global cultural texts are reinterpreted locally. This study examines an instructional model implemented in a Japanese university setting that integrates film-based translation activities into a collaborative learning project. It hypothesizes that engaging learners in film-based translation projects fosters heightened awareness of global-local relationships through contextualized meaning-making.

The instructional model has been under development since 2020 in Japanese–English translation courses for English-major university students. During the first eight weeks of a 14-week semester, students engage in preparatory activities using film subtitles, comparing Japanese subtitle translations with original English audio and transcribing dialogue. These tasks are designed to promote attention to meaning, context, and translation choices with instructor scaffolding. In the subsequent six-week project phase, students work collaboratively to create a bilingual film viewing guide webpage for English language learners. Each group selects a film, researches relevant social and historical background, produces explanatory texts in Japanese, and translates them into English.

Data were collected through classroom observations, learner perception surveys, translation samples, and students' reflective commentaries. Qualitative analysis indicates notable shifts in students' perceptions of language learning. Many students reported increased awareness of the importance of background knowledge and cultural context, greater sensitivity to meaning beyond literal translation, and a reassessment of films as legitimate resources for language learning. These findings suggest that film-based translation projects can function as an effective pedagogical site for developing global-local awareness, bridging the gap between classroom language study and real-world language use, and offering implications for glocal learning in higher education.



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C24.09-Dynamics of Economic Spaces => Digitalization and Employment: Challenges for Inclusion and Diversity in the Industry 4.0 New Spatial Configurations



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2099 - Research On The Spatio Temporal Evolution And Impact Of China's Digital Economy And Green Innovation

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It is of great significance to study the impact of China's digital economy on green innovation under present conditions. In this work, panel data were used, and research tools such as the entropy method, the Markov chain with a spatial Markov probability transition matrix, and a spatial Durbin model were applied to analyze the temporal and spatial evolution of the digital economy and green innovation in 287 Chinese cities from 2011 to 2021, exploring the influence of the digital economy on green innovation. The results show that the digital economy and green innovation in Chinese cities exhibited an upward trend. There was a basic spatial pattern consisting of "high levels in the east and low levels in the west" regarding the digital economy and green innovation, with the aggregation types primarily being "HH" and "LH". Moreover, the types of digital economy and green innovation in Chinese cities are relatively stable, with neighboring areas influencing local changes. The digital economy has a significant promotional effect on green innovation, as well as spatial spillover effects; the differing influences over time can be used to categorize the cities into four groups, with most falling within the first two categories. Based on these findings, relevant countermeasures are proposed, seeking to further enhance the role of the digital economy in promoting green innovation. This work provides a research basis and policy suggestions to contribute to continuous improvements in China's digital economy and green innovation, leveraging the promotional effects of the former on the latter.



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2101 - Analysis Of Urban Housing Policy Classification And Governance Logic Based On A Hybrid Architecture Of Large Language Models

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Accurate classification of housing policies constitutes a core foundation for unpacking the logic of urban housing governance and trajectories of institutional change. To tackle classification challenges inherent in small-sample government documents—characterized by high term density, semantic overlap, and structural nesting—this study focuses on 262 core housing policy documents from Guangzhou (1989–2025). It develops a hybrid intelligent classification architecture integrating GPT-4o, BERT, and XGBoost, and systematically assesses the scenario adaptability of five model variants.

Key findings are as follows: First, leveraging dual mechanisms—macroscopic semantic constraint and microscopic terminology perception—the hybrid architecture enhances classification accuracy by 21.21% relative to the standalone GPT-4o model. This addresses the limitation of traditional models in the granularity of semantic comprehension. Second, model performance demonstrates a significant “scenario-feature” adaptation effect, with each model’s strengths closely aligned with the characteristics of policy texts. Third, the classification results unpack the dual “tool-institution” logic of housing governance: tool-layer policies (e.g., housing finance, market regulation) function as external vehicles for regulation, whereas institution-layer policies (e.g., affordable housing initiatives, institutional reform) serve as internal pillars of governance. These two policy categories complement one another to form an integrated governance system. The proposed small-sample government document precision-adaptation framework provides a standardized tool for the quantitative analysis of housing policy evolution. Its technical pathway can be rapidly transferred to other cities and domains, offering methodological insights for the structured parsing of cross-regional and cross-domain government documents and the excavation of governance logic.



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C24.11-Gender and Geography: Care, Connection and Change => Decolonial Thinking in Feminist Geographies



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1865 - Rethinking The Mobility Of “young Women” In Japan’ S Regional Cities Local Communities And Female College Students’ Automobility

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In recent years, Japan’s regional cities have witnessed a continuing increase in the outmigration of women, particularly those classified as “young women” between the ages of 20 and 39. This demographic trend has attracted growing attention because of its anticipated contribution to population decline of regional cities. This study investigates the social environments surrounding these women and analyzes the decision-making processes that influence whether they remain in or depart from regional cities. Particular focus is placed on the role of the automobile. While cars are often treated as discretionary commodities in metropolis, they function as indispensable tools of everyday life in regional contexts. The hypothesis is that by shaping access to education, employment, and social relationships, automobiles play important role in structuring mobility and life choices. The analysis is based on qualitative interview data collected in 2021 from female college students in their twenties. The research was conducted in Gunma Prefecture, located approximately 100 kilometers from Tokyo.

Since the 2000s, regional cities in Japan have experienced an expansion of consumer-oriented lifestyles, increasing access to goods, services. Within this setting, automobiles—serving as the primary mode of transportation for female college students—enable the construction of a daily activity sphere within a radius of roughly 20 to 40 kilometers. Such mobility facilitates attendance at local universities and participation in regional labor markets and is frequently interpreted as an outcome of individual choice and autonomy. At the same time, these life plans are strongly oriented toward maintaining proximity to parents and relatives, shaped by expectations that women will assume future caregiving responsibilities. Under these conditions, the automobile functions in an ambivalent manner: it represents both a means of independence and a mechanism that confines mobility within the region. Consequently, opportunities for autonomous movement remain more limited for women than for men.



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C24.12-Geographical Education => Geographic Education in a Plural World: Advancing Diversity and Inclusion



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1992 - Mainstreaming Gender In Geography Education A Teacher's Guide

*Maria Prats Ferret*¹, Mireia Baylina¹

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The incorporation of a gender perspective in geography has transformed the discipline: it has broadened our understanding of space, place, and landscape, and has contributed to rethinking the socio spatial processes that shape our lives. The social construction of difference conditions the experiences of men and women in different geographical contexts. At the same time, our gendered experiences are also shaped by other factors of social differentiation such as age, class, religion, ethnicity, sexuality, citizenship, language, or functional diversity, among others, meaning that the intersection between them produces specific experiences for individuals.

In this poster, we present reflections on the need to introduce this perspective transversally in the teaching of geography across all its specializations, along with practical proposals applied to various contents within the university curriculum. Drawing from our many years of teaching experience at both undergraduate and master's studies, delivering geographical content with a gender perspective, we aim to share our practice in order to promote the mainstreaming of this approach throughout the discipline.

We present general proposals for introducing a gender perspective in teaching—from adopting a critical stance toward the production of geographical knowledge to explaining and using basic concepts in gender studies from a geographical standpoint. We then develop specific proposals outlining objectives, diverse contents, and ways of assessing courses taught with a gender perspective. Finally, we provide teaching and pedagogical resources on geography and gender.

We are aware that this shift poses challenges for teachers who are not familiar with this approach; therefore, we offer teaching strategies and good practices, not only regarding content but also in teaching methods and classroom practices. This proposal helps in advancing the introduction of critical pedagogies in the teaching of geography in a global context where social changes have made classrooms increasingly socially and culturally diverse.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Integrated Geography for Sustainable Development



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2621 - Sanitation As Landscape Care □ A Geographical Analysis Of Toilet And The Recycling Based Society

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1. Background and Hypothesis

Sanitation systems—the frameworks surrounding excretion and its management—have evolved in diverse ways across time and space, shaped by regional variations in natural conditions (such as water resources, climate, and topography) and social factors (including capital, technology, and knowledge).

Focusing on this diversity, this study examines the regional characteristics of toilets, excretion, and sanitation from a geographical perspective, with the aim of generating new academic insights into circular societies.

2. Materials and Methods

First, I provide an overview of the history of human waste management in Japan, clarifying the changes in toilet and sewer system development. Next, I analyze regional variations in sewage treatment methods and sewer system coverage.

Building on this analysis, I focus on examples of environmentally conscious toilets and sewage treatment technologies that have emerged in response to recent sewer system development and its associated challenges. Data on their installation contexts, maintenance practices, and usage patterns were collected and analyzed through field surveys.

3. Results

Since the 1960s, Japan's local governments have led the rapid expansion of sewer systems and sewage treatment facilities. More than sixty years later, the maintenance of these facilities and the development of new operational approaches have become increasingly important.

Pioneering initiatives include the installation of environmentally friendly toilets, whose numbers continue to grow nationwide.

4. Conclusion

The findings of this study demonstrate that toilets and sewage treatment facilities are now expected to serve functions beyond the mere disposal of waste. In particular, they are being reinterpreted as sanitation systems that contribute to “landscape care”—addressing broader ecosystem health—and to the realization of a recycling-based society.



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C24.14-Geography and Sustainability (Geography for Future Earth: Coupled Human-Earth Systems for Sustainability) => Landscape Sustainability Science and the Sustainable Development Goals



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2042 - Impacts Of Climate Change On Landscapes Of European Russia And Western Siberia

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Global warming is manifested with varying intensity in transformations of the plain landscapes of Russia. Vegetation productivity, biomass, and distribution boundaries respond to changes in thermal conditions and moisture availability. A potential consequence of ongoing warming is a shift in landscape zone boundaries. This study evaluates changes in the climatic characteristics of natural landscape ranges of the Russian plains that have occurred over the past two decades and may create preconditions for future transformations of landscape zones and subzones. The study area covers the European part of Russia and Western Siberia, encompassing landscapes from Arctic to semidesert zones. The analysis is based on data from 265 meteorological stations for the period 2000–2022 and on the normalized difference vegetation index (NDVI) for the summer season as an indicator of photosynthetically active biomass. The analysis focuses exclusively on climatic characteristics of landscapes, including mean annual air temperature, January and July temperatures, the sum of temperatures above 10 °C, annual precipitation, and the moisture coefficient, as well as their mean values, standard deviations, and trends over 2000–2022. The results indicate a positive trend in the sum of active temperatures and a negative trend in precipitation in the forest–tundra zone, leading to a decrease in the moisture coefficient. Climatic conditions in parts of the tundra, forest–tundra, and northern and middle taiga have shifted toward those typical of more southern landscape zones. These changes are supported by positive NDVI trends and the observed “greening” of the Arctic tundra in Russia, Alaska, and Canada, primarily associated with increasing summer temperatures. Such changes may result in a poleward shift of landscape zone boundaries. In southern Russia, increasing sums of active temperatures combined with progressive aridification are observed, reflected in declining NDVI values and potentially leading to the expansion of steppe, dry steppe, and semidesert zones. The vegetation response to recent climate change is therefore consistently confirmed by changes in the normalized difference vegetation index.



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2681 - Study Of Ecosystem Response To Global Warming In Russia Based On Remote Sensing Data

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The study investigates the response of key surface characteristics (the NDVI vegetation index, albedo, and surface temperature) in Russian regions most susceptible to summer warming. The analysis of their dynamics was used to assess ecosystem evolution under climate change conditions.

For the analysis, MODIS data from the period 2000–2025 with a spatial resolution of 0.05° were used: NDVI (MOD13C2 product), albedo (MCD43C1), and surface temperature (MOD11C3). To interpret the processes, a method for classifying surface temperature regulation types based on the direction of the relationship between albedo and temperature was applied.

The following results were obtained:

1. In the subboreal zone of southern European Russia, increased summer warming is accompanied by an expansion of areas with a radiative type of regulation (negative albedo-temperature relationship), characteristic of poorly developed or absent vegetation cover. The growth of such areas, calculated from trends for the summer months, indicates the formation of new seasonal hotspots of desertification and vegetation degradation.
2. In the boreal zone of southern Central Siberia, an evapotranspirational type of regulation (positive albedo-temperature relationship) predominates. However, under extreme temperature increases or following fires, areas with a radiative type appear here in a mosaic pattern.
3. In the subarctic zone of northern Central Siberia, warming, on the contrary, leads to a reduction in areas with a radiative type of regulation due to increased bioproductivity associated with the growth of phytomass.

The obtained results suggest that further increases in air temperature will contribute to:

- The expansion of areas with a radiative type of temperature regulation in the subboreal zone;
- The persistence and mosaic emergence of such areas in the boreal and subarctic zones.

The actual extent and distribution of these areas are determined by a combination of factors, including topography, local environmental and climatic conditions.

This study was carried out with support from a grant from the Ministry of Education and Science of the Russian Federation (agreement no. 075-15-2024-554 of April 24, 2024).



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**C24.14-Geography and Sustainability (Geography
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2486 - Permaculture As A Spatial And Environmental Approach In South Africa

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Background

In the context of sustainable agriculture, permaculture can be conceptualized geographically as a spatial practice that arranges and adjusts soils and crops through farm design, linking ecology, livelihoods, and social relations. However, empirical research remains limited on how permaculture is introduced, practiced, and disseminated under specific local conditions. This study therefore focuses on “design” in agricultural production and examines how farmland is spatially and structurally assembled through practice.

Methods

This research is based on fieldwork conducted between 2016 and 2025 in rural areas and farms in Limpopo and Gauteng Provinces, South Africa, where permaculture is actively practiced alongside outreach and educational activities for young people from neighboring villages. Data were collected through interviews focusing on crop selection, the spatial structure and arrangement of fields, and educational activities. In addition, soil component analyses were conducted to examine the effects of permaculture practices on soil formation and maintenance.

Results

The results show that farmland is spatially designed in relation to topography, solar exposure, and water flows, with field layouts integrated with water reservoirs and storage facilities to address limited water resources. Crop species are selected for multiple functions—including food production, pest control, and soil improvement—forming a multilayered configuration. Soil management further incorporates local resources such as kitchen waste, animal manure, and termite mound soil. Together, these elements constitute a farmland design that also serves as a visible model for dissemination and educational activities.

Conclusion

The findings demonstrate that productive, multilayered farming spaces are constructed through a detailed understanding of environmental conditions and plant characteristics. This presentation interprets these practices as a “spatial structure of farmland,” for med in response to environmental conditions and supporting sustained agricultural practice.



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C24.15-Geography of Governance => Local and Urban Governance: Trends, Challenges, and Innovations



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1772 - Municipal Solidwaste Management In Delhi (2016–2025) Trends In Collection Segregation Treatment And Policy Response

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Background/Hypothesis

Solid Waste Management (SWM) is central to sustainable urban development in India, with Delhi generating about 11,000–11,352 tonnes of municipal solid waste (MSW) per day in recent years, the highest among Indian cities. Per capita MSW generation in Delhi is estimated at around 0.45–0.46 kg per person per day, above the average of 0.39 kg reported for major Indian cities. The hypothesis is that, despite significant policy push under Solid Waste Management Rules 2016 and Swachh Bharat Mission (SBM/ SBM U 2.0), structural gaps in segregation at source, scientific processing and legacy waste remediation persist in Delhi.

Materials and Methods

The study undertakes a secondary data–based assessment of trends in waste generation, collection, segregation and treatment across Delhi's Urban Local Bodies from 2016–2025. Data are compiled from Delhi Pollution Control Committee/MCD action plans and solid waste status reports, CPCB's 2020–21 MSW report, SBM U dashboards and recent scholarly assessments of MSW in Delhi. Indicators include daily MSW generation, processing capacity, proportion of waste scientifically treated, share of segregated waste, and volume of legacy waste bio mined at key dumpsites (Ghazipur, Bhalswa, Okhla).

Results

Findings indicate near stagnant daily MSW generation around 11,000–11,352 TPD, with only about 70–75% being processed through waste to energy, composting and other facilities, and the remainder landfilled. More than 70% of Delhi's waste stream is biodegradable or recyclable, yet up to 90–92% still ends up in landfills or WtE plants due to inadequate source segregation. Legacy waste at Delhi's dumpsites remains above 17–18 million tonnes, although SBM U 2.0–supported biomining has remediated hundreds of lakh tonnes nationally and reclaimed significant landfill area since 2021.

Conclusions

The analysis shows incremental improvements in door to door collection, processing capacity and legacy waste remediation, but critical shortfalls in segregation at source and fully scientific disposal remain. Achieving Delhi's projected requirement of processing nearly 19,500 TPD of waste by 2041 will demand accelerated investments in decentralized segregation, bio methanation, material recovery and strict enforcement of SWM Rules 2016 and SBM U 2.0 benchmarks.



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C24.16-Geography of Digital Society and Connected World => Digital Night Studies



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2586 - A Geoai Framework For Detecting Recurrent Nighttime Fishing Hotspots With Viirs Nighttime Imagery Using Convolutional Autoencoders And Gaussian Mixture Models

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Nighttime satellite imagery provides a powerful means of monitoring fishing activity in data-limited marine regions. This study introduces a GeoAI framework that integrates VIIRS Day/Night Band monthly composites with a convolutional autoencoder and Gaussian Mixture Model to classify and interpret spatial and temporal fishing patterns in the Korean Exclusive Economic Zone from 2014 to 2024. The autoencoder effectively compresses high-dimensional nighttime light observations into interpretable latent features, enabling the identification of four recurrent spatial configurations that correspond to seasonal fisheries cycles. The CAE-GMM (Convolutional Autoencoder - Gaussian Mixture Models) approach demonstrated strong reproducibility across repeated runs, providing its reliability for large-scale spatiotemporal pattern recognition in marine environments.

The analysis identified seven major and persistent nightlight hotspots: the Korea–China Provisional Measures Zone, waters around Jeju Island, the Korea Strait, the Yellow Sea corridor, the east coast, the Ulleung–Dokdo region, and the northeastern EEZ corner. These hotspots highlight both stable and evolving centers of fishing activity. Temporal analyses revealed a consistent annual cycle but also notable shifts since 2020, including expanded winter (Cluster 0) and autumn (Cluster 3) patterns and a contraction of spring (Cluster 1) activity. These changes suggest altered seasonal timing and fleet redistribution likely influenced by regional ocean environmental change and evolving fisheries regulations.

Overall, this research demonstrates the analytical power of combining deep learning and probabilistic modeling to uncover recurrent fishing activity patterns. It represents one of the first systematic efforts to cluster and interpret nightlight-based fishing dynamics in the open ocean, offering a scalable, data-driven approach for fisheries monitoring and providing new insights into how fishing activity is responding to a rapidly changing marine environment.



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C24.16-Geography of Digital Society and Connected World => Geospatial Technologies and Addressing Urban and Rural Sustainability Issues



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2006 - The Social Implications Of Gps In Japan Media Discourses And Spatialized Anxieties

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Location-based technologies have become ubiquitous and indispensable across almost all spheres of contemporary society. While they enrich everyday life in various ways, they also entail risks, including excessive surveillance and infringements on privacy that may harm individuals both physically and psychologically. In response, research in the humanities and social sciences has increasingly adopted critical perspectives on the social implications of location-based technologies. Within human geography, approaches such as critical GIS and critical data studies have been actively developed. Building on these strands of research, this study examined the social implications of the Global Positioning System (GPS). Focusing on Japan as a case study, it analyzed newspaper articles that mention GPS in order to explore how GPS has been perceived and discussed in public discourse.

This study conducts both quantitative and qualitative analyses of the content of 1,849 GPS-related articles published in Japan's two major national newspapers, Yomiuri Shimbun and Asahi Shimbun, up to December 31, 2024. The results show that while articles in the 1990s primarily addressed disaster prevention and transportation, since the 2000s nearly 40 percent of the articles have been related to crimes and accidents. This suggests that GPS has increasingly been recognized either as a response to social anxieties or as a technology that amplifies such anxieties.

Many crime- and accident-related articles focus on the legality of police use of GPS for criminal investigations, as well as on crime prevention for children and the prevention of wandering among older adults with dementia through GPS-enabled mobile devices. The former tend to appear in national news sections, whereas the latter are more often covered in local sections. Consistent with previous studies that highlight the ambivalent and multilayered anxieties underlying digital technologies, this study revealed that Japanese newspaper coverage of GPS reflects spatially differentiated anxieties, ranging from national-scale legal concerns to locally grounded fears related to everyday safety.



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2087 - Development Of An Automated Satellite Based Wildfire Detection Pipeline Using Deep Learning For The Guerrero State Mexico.

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Uagro - Cipes Acapulco, Geography And Territorial Management, Acapulco-Mexico¹

ABSTRACT

Background:

Wildfires constitute an increasingly severe socio-environmental risk in Mexico, with certain states consistently ranking among the most affected nationally in terms of burned area and event frequency. These regions combine high ecosystem vulnerability, extensive forested landscapes, and growing human–environment interactions. This study presents an ongoing geotechnology development designed to automatically detect wildfire activity from satellite imagery using deep learning. The working hypothesis is that an AI-driven detection pipeline can generate timely and spatially explicit information to support decision-making in highly exposed territories.

Materials and Methods:

The workflow integrates satellite data access and preprocessing through Google Earth Engine, followed by deployment of a TensorFlow-based classification model. The approach performs pixel-level identification of wildfire signatures relative to background land-cover conditions. The pipeline is being developed for application in one of the Mexican states with the highest wildfire incidence, with planned integration into a geospatial risk-monitoring dashboard.

Results:

Current work is focused on evaluating alternative model configurations, and designing consistent geospatial processing routines to ensure operational stability. A structured performance assessment will be completed prior to the conference to examine detection accuracy and spatial reliability.

Conclusions:

This research highlights the potential of combining remote sensing and AI-based classification for wildfire monitoring in highly exposed territories in Mexico. The system under development aims to contribute to scalable wildfire analytics supporting early warning, territorial planning, and risk governance. Ongoing work will further refine the modelling strategy and operational deployment.



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2351 - Linguistic Landscapes As Indicators Of Tourist Presence And Urban Dynamics

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Linguistic landscapes serve as visible indicators of the linguistic background of those who interact with and consume the spaces. In popular tourist destinations, commercial signage and public texts often adapt to accommodate the languages of visiting populations. However, tourists are not the only economic stakeholders shaping these environments; residents, local workers, and business owners also contribute to the linguistic makeup of public space. Despite growing interest in linguistic landscapes, the extent to which they align with the functional character of tourist spaces remains underexplored. In this work, we investigate whether and how linguistic landscapes captured in geotagged images reflect the presence and influence of tourism. Specifically, we examine the degree of alignment between language use in signage and known tourist activity patterns. By analysing the distribution, composition, and language choices of signage in various urban zones, this work seeks to uncover how visibly tourism manifests through language in public space and what it may conceal. Ultimately, we aim to evaluate the diagnostic power of linguistic landscape images in identifying tourist zones. In doing so, we will illustrate the complex interplay between tourism, local economies, and urban structures. The findings from this work will demonstrate the potential of linguistic landscape images not only as a data source but also as a valuable diagnostic tool for tracing spatial transformations in tourist areas.



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C24.17 Geography of Tourism, Leisure, and Global Change => Inclusive Tourism and Leisure: Global Design, Local Realities



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2254 - Between Global Design And Local Constraints Accessibility In European Pilgrimage Centres

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Inclusive tourism increasingly establishes accessibility as a global norm. However, European pilgrimage centres are embedded in heritage-protected fabrics, challenging topographies, and routinised ritual practices that can inadvertently reproduce exclusion. This paper addresses the session's "Inclusive Tourism and Leisure: Global Design, Local Realities" tension by conceptualising pilgrimage centres as public arenas where accessibility is not merely a technical upgrade but a matter of a "right to the shrine"—an analytical heuristic for the right to participate fully in pilgrimage and leisure practices.

The study draws on a multi-year, repeated-observation dataset gathered across 20 diverse Catholic pilgrimage centres in Europe. A comparative case-study design contrasts formal accessibility policies articulated by religious and municipal authorities with lived spatial experience, examining physical, sensory, informational, and organisational barriers.

The paper foregrounds pilgrimage centres as sites where universal design is negotiated in place, bound by heritage protection and pastoral care. It identifies where standard design solutions are feasible and where accessibility is instead achieved through organisational and pastoral "workarounds" that compensate for immovable material constraints. While disability inclusion in religious tourism is long-standing (historically pivotal in sites like Lourdes), its contemporary governance and spatial scripting are rapidly evolving.

The analysis reveals that barriers and levers for change emerge from the interaction of heritage conservation, ritual scripting of movement, and governance arrangements. Inclusivity is increasingly pursued through multi-level interventions: facilities for physical impairments; strengthened wayfinding provisions; and pastoral initiatives that frame inclusion as a collective responsibility. Furthermore, the study demonstrates an expanding inclusivity agenda addressing intellectual and mental disabilities, including tailored pilgrimages for neurodiverse individuals. By situating these practices within the "right to the shrine," the paper shows how accessibility functions simultaneously as design practice, institutional policy, and moral-political claim—offering a grounded account of how global norms are translated into local, heritage-constrained realities.



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2745 - How Can Artificial Tourscape Immerse Tourists The Serial Mediating Effect Of Fantastic Imaginary Orientation And Character Identification

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While the immersive format has emerged as a pivotal driver of cultural and tourism consumption amid the rapid integration of digital technology and cultural tourism, the underlying mechanism of tourist immersion remains underexplored—particularly in artificial toursapes (e. g., theme parks, immersive performance spaces) where immersive experiences serve as the core attraction. To address this research gap, this study empirically examines the relationships among artificial tourscape, fantastic imaginary orientation, character identification, and tourist immersion by analyzing survey data collected from 388 Chinese tourists using structural equation modeling (SEM).

The empirical results demonstrate that artificial tourscape, fantastic imaginary orientation, and character identification all exert significant positive impacts on tourist immersion. Additionally, fantastic imaginary orientation and character identification exhibit a serial mediating effect in the relationship between artificial tourscape and tourist immersion: the artificial tourscape first stimulates tourists' fantastic imaginary orientation, which further promotes their identification with the tourscape's characters, ultimately facilitating the formation of deep tourist immersion.

This study enriches the theoretical understanding of the fundamental processes and features of tourist immersion within artificial tourscape contexts, filling a critical void in the existing tourism literature. Practically, it offers actionable insights for tourism managers, highlighting the importance of optimizing artificial tourscape design to foster tourists' fantastic imaginary orientation, designing interactive and narrative-driven activities to enhance character identification, and thus improving the quality of immersive tourism experiences and boosting destination competitiveness.



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C24.17-Geography of Tourism, Leisure, and Global Change => Borders and Tourism: Borders as Spaces of Connection and Cooperation



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1847 - Network Restructuring And Power Reconfiguration In Asia Pacific Tourism Crisis Conflict And Adaptive Geographies

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This study examines the restructuring of tourism networks and power dynamics in the Asia-Pacific region against a backdrop of recurring crises, geopolitical tensions, and periods of stagnation. Using social network analysis of cross-border tourism flow data from 2004 to 2023, we map how connectivity and influence have shifted in response to regional disruptions. While traditional hubs retain structural advantages, emerging tourism geographies are increasingly shaped by adaptive strategies among state and non-state actors. China's dual role as key source market and destination has repositioned regional hierarchies, while secondary nodes such as Vietnam and the UAE have leveraged digital platforms and diplomatic channels to enhance their brokerage functions. The analysis identifies three coexisting spatial patterns: resilient corridors sustained by strong institutional ties; contested zones where tourism flows are diverted or suppressed by conflict; and adaptive peripheries that utilize narratives of sustainability and niche marketing to bypass traditional core-periphery constraints. We argue that crises act as catalysts for network reorganization, revealing latent power asymmetries and creating opportunities for renegotiating roles within the regional tourism architecture. By integrating crisis-sensitive and network-aware perspectives, this research provides a framework for understanding tourism's evolving geography in an era of uncertainty, offering strategic insights for stakeholders navigating fragmentation and change in the Asia-Pacific.



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C24.17-Geography of Tourism, Leisure, and Global Change => Community Empowerment, Justice, and the Local in Tourism



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1685 - James Bond Is Forever – The Need For Symbols And Leaders In Sustainable Film Tourism –
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The 007 film series, depicting the exploits of British intelligence agent James Bond, premiered in 1962. The popularity of the series has remained undiminished over the past 60 years.

Twenty-five Bond films have been produced to date, with the fifth instalment, *You Only Live Twice* (1967), set in Japan. Filming took place across various locations in Japan 60 years ago, in 1966. While most locations no longer retain their appearance, the fishing village scenery captured in Akime, Minamisatsuma City, Kagoshima Prefecture, remains virtually unchanged. Consequently, Akime attracts 007 fans both from Japan and abroad.

In Akime, a building used during filming, now known as 'Kissy & Bond's House' after characters in the film, still stands. Given its severely dilapidated state, it was considered for demolition, but local enthusiasm to 'preserve the original building' led to its conservation. Central to this preservation effort are individuals such as Mr.K, a fruit orchard owner in his thirties who recently relocated to Akime. They established a general incorporated association to preserve the building and raised funds through crowdfunding. With significant support from 007 fans outside the region, the target amount was ultimately reached, and the house was renovated between 2024 and 2025. The building's interior is now largely cleared and accessible to visitors. Renovation work will proceed, while specific uses, such as establishing a museum, are explored. Once renovations are completed, the house is expected to become a symbol for the film's location shooting in Akime, delighting many fans.

Previously, in 1990, a monument was erected on a hill overlooking the filming location, spearheaded by Akime's Youth Association. Central to this initiative was Mr.M, a fisherman from Akime. While the monument long served as a popular symbol of the filming location for fans, the addition of a new symbol – 'Kissy & Bond's House' – is expected to further enhance Akime's appeal as a filming destination. Mr.M passed away in 2024 at the age of 68. However, new leaders, such as Mr.K, have forged a path towards the sustainable development of the small fishing village of Akime as a 007 filming location.



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1964 - Social Media–induced Tourism And Community Responses The Balancing Of Visitability And Liveability

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Background

Visual user-generated content (UGC), such as tourists' photos and videos shared on social media, has become a powerful force in shaping destination images and influencing travel practices (Peralta, 2019). Through its visual appeal and viral circulation, UGC can turn previously little-known places into popular destinations. However, rapid tourism growth driven by social media exposure may also disrupt everyday life and generate tensions between tourists and residents, highlighting the need to examine how destinations balance visitability and liveability (Sepe, 2017).

Materials and Methods

This study adopts a qualitative case study approach focusing on Mitoyo City in Kagawa Prefecture, Japan, which experienced rapid tourism growth after Chichibugahama Beach gained popularity on Instagram after 2017. Data were collected through participatory observation, semi-structured interviews, and social media content analysis. The analysis draws on a community-based tourism perspective and the concept of related population. According to the Ministry of Internal Affairs and Communications of Japan, related populations are actors positioned between residents and short-term tourists who engage with local communities in sustained ways (MIC, n.d.).

Results

The findings indicate that social media–induced tourism has reshaped local space use and affected residents' everyday lives. In response, the local community, related populations, and DMOs have developed collaborative practices to manage tourism pressure and balance destination visibility with community liveability. These include voluntary photographic guidance, beach clean-up activities, and a tri-partite visual production and promotion scheme involving the DMO, local businesses, and local photographers.

Conclusions

This study suggests that the sustainability of social media–induced tourism depends in part on whether local residents, DMOs, and related populations can remain actively involved in shaping how tourism is organised. Among these actors, related populations play a particularly important role by acting as intermediaries between community concerns and DMO agendas. Because they combine emotional attachment to place with professional knowledge and access to resources, they are often able to initiate and coordinate initiatives that appear to benefit both tourism development and the local community. At the same time, such initiatives require critical examination in practice, particularly in terms of who ultimately benefits from them.



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1976 - Stakeholder Governance And Sustainability Of Touristic Routes Evidence From Romania

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The proliferation of touristic routes in post-communist Romania has often followed a “Top-Down” administrative logic, prioritizing physical or digital infrastructure over social capital. While intended to stimulate rural regeneration, many state-led initiatives—such as various Wine Roads or monastery routes—have resulted in “phantom routes”: corridors of asphalt or just a digital platform devoid of genuine local engagement or sustainable hospitality. This paper critically examines the governance architectures of such routes through the lens of sustainability and community empowerment, contrasting the fragility of these administrative constructs with the resilience of “Bottom-Up,” civic-led models exemplified by Via Transilvanica.

Utilizing the Pentahelix Model (Government, Academia, Business, Community, Media) as a diagnostic framework, we argue that sustainable tourism is not a product of engineering but of social infrastructure. Our analysis reveals that Top-Down approaches frequently perpetuate procedural injustice by excluding local residents from decision-making, reducing them to passive bystanders in their own territories. This misalignment leads to a failure of “coopetition” and governance, key critical success factors identified by Pedrosa et al. (2025), resulting in high attrition rates for state-funded projects.

Conversely, the Bottom-Up approach, driven by non-governmental actors (e.g., Tășuleasa Social), operationalizes Adie and Amore’s (2022) call for longitudinal partnerships that transcend short-term political cycles. By actively engaging the “Community” and “government” helices—specifically through partnerships with local administrations and volunteer networks—civic routes foster “psychological ownership” among locals. This shifts the paradigm from “drive tourism,” which Cruz et al. (2022) warn often neglects social consequences, to a slow, restorative mobility that valorizes local identity and intangible heritage (Zouridaki et al., 2024).

We conclude that for touristic routes to transform from wasteful bureaucratic exercises into resilient engines of local justice, governance must shift from a state-managed to a community-centric model. Functional sustainability is achieved only when the “network structure” connects stakeholders horizontally (Vada et al., 2023), empowering rural communities to transition from resource providers to stewards and primary beneficiaries of the touristic experience.



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C24.17-Geography of Tourism, Leisure, and Global Change => Cryotourism Geographies in the Polycrisis



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2537 - Cryotourism Facing The Climate Crisis

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Cryotourism is an umbrella concept to define a common ground for those touristic and recreational attractions and activities that are based, and often dependent, on the components of the cryosphere and the cold climate geographies in general. The cryotourism sector can often be seen as a remedy to counteract socioeconomic development challenges in regions otherwise characterized by harsh physical conditions – such as the polar and mountainous areas. Yet, unsurprisingly, such sector is also at the forefront of facing the climate crisis, be it through the increased popularity stemming from the “last chance tourism” concept and the adaptation challenges of the multi-billion dollars ski industry or the least discussed carbon risks, e.g. with the ever-increasing travel footprints of polar holidays. In this poster, we introduce the forthcoming open-access book “Cryotourism: Facing the Climate Crisis”, which brings together a very geographically diverse set of case studies that present sometimes unique and sometimes similar challenges to face both the climate and the carbon risks of global warming. In this respect, the book offers a true interdisciplinary synthesis at the intersections of human and physical geographies, glaciology, bioclimatology and tourismology. The edited volume contains 14 chapters starting with the conceptualization of cryotourism, leading to cases from polar, glacial, mountainous and even artificial environments, and ending with an outlook on the emerging global polycrisis and its implications for cryotourism. Moreover, the open-access book is geovisualized with a state-of-the-art Web GIS and a digital serious game to present its case-based contents in an edutaining fashion. Such innovative and interactive way of formatting is considered as an added value of the book to showcase the use of geography as a tool.



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C24.17-Geography of Tourism, Leisure, and Global Change => Geographies of Heritage Tourism



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1393 - Mechanisms Influencing Citizenship Behavior In Heritage Tourism Destinations

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As pivotal participants and stakeholders in heritage tourism activities, residents' citizenship behavior significantly influences the sustainable development of heritage tourism destinations. This study considers empowerment theory in exploring the driving mechanisms that empower three types of citizenship behaviors, which are empirically tested using partial least squares–structural equation modeling (PLS-SEM). First, residents' economic, social, and political empowerment in heritage tourism destinations positively influences their involvement in heritage tourism activities, with political empowerment having the greatest impact. Second, compared with earlier studies on heritage tourism destination residents' citizenship behaviors, this study considers the role of tourism empowerment, leverages its positive effects, and overcomes the limitation of treating tourism empowerment solely as an external driving force. The results demonstrate that empowering heritage residents through their involvement in tourism activities fosters place attachment and subjective well-being, which enhances their citizenship behavior. The formation of citizenship behaviors among residents in heritage tourism destinations tends to follow a pathway from tourism empowerment to involvement, place attachment, and subjective well-being to citizenship behavior. Third, following fuzzy-set qualitative comparative analyses (fsQCA), residents' citizenship behavior in heritage tourism destinations was found to be influenced by different factor configurations. Considering residents' conditional presence through various configurational pathways, this study categorizes three ways that citizenship behavior forms among heritage residents: namely, politically driven, socially driven, and comprehensively driven citizenship. Fourth, this study validates the complementary nature of the PLS-SEM and fsQCA methods. The PLS-SEM analysis revealed that psychological empowerment did not have a significant direct impact on residents' involvement in tourism, while the fsQCA results highlighted the importance of psychological empowerment in specific configurational pathways. The findings also suggest that psychological empowerment is not a universal direct driver of tourism involvement, but that under specific combinatorial conditions, it can become one of the key elements triggering citizenship behaviors among residents in heritage tourism destinations. These findings provide a fresh approach to understanding the relationship between tourism empowerment and residents' citizenship behaviors, with theoretical insights and managerial implications for promoting the sustainable development of heritage tourism.



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1859 - From Authority To Living Story Tourist Engagement And Narrative Reproduction In Heritage Tourism

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While cultural heritage sites are often regarded as transmitters of authoritative historical narratives, the active role of tourists in reshaping these narratives through media-informed, embodied practices remains underexplored. Using the Forbidden City—a UNESCO World Heritage site which serves as a typical field for the cinematic adaptation of Qing-era palace dramas—as a case study, this research analyzes travelogues, a reflective and narrative-rich genre, to examine how tourists engage in narrative reproduction.

Through a qualitative thematic analysis of 27 online travelogues, the study identifies a dual-process mechanism: experiential engagement (material interaction, scene re-enactment, affective response) and strategic interpretation (role-playing, entertainment-infused reading, vernacular translation). This framework enables tourists to transform institutional histories into narratives centered on everyday life and gendered perspectives, thereby driving the contemporary reinterpretation of heritage meaning and materializing these new narratives through self-authored media.

Intertextual knowledge, personal lived experience, and reflexive embodied presence are central to this narrative agency. Theoretically, this study advances heritage scholarship by (1) positioning tourists as active co-creators who enact agency through writing, (2) proposing a dual-process model of narrative reproduction, and (3) recognizing screen media as “cultural intermediaries” alongside tourists’ reflexive presence as critical elements in co-creating heritage meaning. Practically, it suggests heritage institutions integrate these visitor-led interpretive strategies into experiential design and communication initiatives—such as employing humorous expression, self-parody, and role reversal—to foster emotional resonance and sustainable engagement.



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2690 - Matrix Comparison Of Tourism Related Spatial Capacity Of Symbiotic Villages In Remote Heritage Sites A Case Study Of Shirakawa Go And Aichun Village

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Background:

In remote areas, World Heritage village spaces are fragile and susceptible to population loss and tourism impact. However, the associated villages surrounding them may possess overlooked value and could influence the protection and development of the core protected villages.

Materials and methods:

Using Ogimachi with its surrounding settlements in Shirakawa-go, Japan, and Azheke with its surrounding settlements in Yuanyang, China, the analysis is narrowed to villages' spatial capacity under tourism operations. It proposes a 2×2 comparative framework for attribution: four quadrants are defined by country and level of protection, multi-source spatial indicators are projected onto a unified space, and similarity between adjacent quadrants is then calculated. Dynamic-capacity data includes road-network and transport structure indicators such as space-syntax integration and entropy, as well as public transportation and parking features. Static-capacity data includes built-environment indicators such as building density, kernel-density extrema, and clustering results. Several tourism outcome variables are also used as supporting evidence on the effect.

Results:

When multiple indicators exist, observed differences can be robustly identified as country-driven, protection-driven, or case-specific, and these three can be divided into 7 reasons behind. This helps identify both similarities and complementarities in carrying pressure between core and surrounding settlements. Evidence suggests that the spatial capacity of tourism in core heritage villages is shaped not only by local uniqueness, but may also be influenced by broader country-level policies and everyday living practices. Meanwhile, surrounding villages show potential to carry non-tourism functions and accommodation functions.

Conclusions:

This study contributes a reusable, cross-case diagnostic method for tourism research in villages of heritage sites, supporting more fine-grained discussion worldwide on the sources of carrying pressure in cultural-heritage tourism and the directions of spatial spillover.



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C24.17-Geography of Tourism, Leisure, and Global Change => Island Contestations: Reclaiming Utopia From Touristification



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2295 - The Impact And Effects Of Media Induced Tourism On Local Communities In Matsue City Japan

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background/hypothesis

Research into the impact of TV dramas and other visual content on regional tourism began in the 1990s and is conceptualized as media-induced tourism. However, very little research has examined the impact of media-induced tourism on tourist destinations and residents, particularly during the broadcast of the content. Therefore, this study aims to examine the impact and effects of media-induced tourism on local communities during the broadcast of a TV drama.

materials and methods

The TV drama in question is “Bakebake” (English title: “The Ghost Writer’s Wife”), a nationwide drama set in Matsue City. “Bakebake” tells the story of the famous Japanese ghost story writer Lafcadio Hearn and his wife, Setsu. It aired for approximately six months from September 29, 2025, achieving an average audience rating of 15% over the three months from October 2025.

This paper first clarifies the tourism characteristics of the region. Second, it summarizes the process leading to the TV drama’s broadcast. Furthermore, we analyzed the impact and effects of Matsue City and the surrounding areas featured in “Bakebake.”

results

As a result, since the start of the aforementioned “Bakebake” broadcast, the number of visitors to the area’s historical heritage sites and museums has increased. Starting in December 2025, a special exhibition in collaboration with “Bakebake” will begin at the museum, and the broadcast of “Bakebake” may be expected to attract more tourists to the area even during the winter, when tourism typically declines. However, we found that the current impact of “Bakebake” on the local community is primarily limited to Matsue City, and not over a wider area.

conclusions

We found that the impact and effects of media-induced tourism on the local community are currently limited to the central area where the TV drama is set, and have not had a significant impact on the surrounding municipalities.



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C24.17-Geography of Tourism, Leisure, and Global Change => Resilience and Sustainability in Tourism Geographies



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1188 - Butterfly Ecotourism Conservation And Sustainability In Taiwan

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Taiwan is widely known as the “Kingdom of Butterflies” and is home to nearly 400 butterfly species, ranking among the world’s most diverse regions for butterflies. During the 1960s and 1970s, rich butterfly resources contributed substantially to Taiwan’s economic development, with the butterfly trade peaking between 1968 and 1975, when annual exports reached an estimated 15–500 million specimens. However, rapid industrialization, urban expansion, and widespread pesticide use severely degraded butterfly habitats, leading to a sharp decline in butterfly populations after the mid-1970s and the rapid collapse of the butterfly trade. Since then, Taiwan has undergone a significant policy shift from commercial exploitation to biodiversity conservation, implementing extensive butterfly conservation efforts—such as habitat protection and restoration, ecotourism development, and innovative measures including highway net systems to protect migrating butterflies—reflecting a broader commitment to sustainable development and ecological stewardship.

Balancing conservation and tourism from a sustainability perspective is a complex and multifaceted challenge. From an ecosystem services perspective, butterflies contribute a range of ecological, cultural, and social-economic functions that benefit both ecological systems and human societies. This study examines human–butterfly interactions in Taiwan through a multidimensional lens encompassing ecotourism, environmental education, cultural practices, conservation initiatives, and public engagement. In particular, butterfly-oriented events and spaces function not merely as tourist attractions but also as sites for ecosystem restoration, environmental learning, scientific knowledge production, and the enhancement of social-ecological well-being. Butterflies acts as more-than-human agents, offering illustrative examples of coexistence and reciprocal relationships between humans and the more-than-human world. This research highlight that sustaining diverse human and more-than-human relationships is fundamental to advancing both human well-being and the long-term resilience of social-ecological systems.



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C24.17-Geography of Tourism, Leisure, and Global Change => Rethinking Tourism as a Site of Protest, Resistance and Political Action



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1818 - Tourism Space As A Space Of Protest

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Tourism is a phenomenon in which the interests of various social groups intersect, including tourists, local communities, and institutional actors. For this reason, tourism space often becomes a space for protest and a stage for expressing views and demands.

The author, whose research focuses on the manifestations of social attitudes in urban space, paid particular attention to areas with excessive tourist traffic, conducting research related to these locations for the purposes of this conference.

The empirical basis is qualitative field research in selected European tourism destinations, using spatial observation, walking methods, elements of visual ethnography, and desk research, which provided extensive research material. The mixed-methods approach captured protest both as a material phenomenon in space and as an affective phenomenon.

Protests take the form of both organized street gatherings and scattered, ephemeral signs inscribed in the tourism landscape. The poster visualizes the relationship between protest and tourism space. The first part focuses on protests directly related to the phenomenon of overtourism and its socio-spatial consequences, such as gentrification, housing pressure, and the marginalization of local needs. Both street demonstrations that temporarily disrupt the functioning of tourism spaces and graphic manifestations of attitudes such as stickers, posters, and graffiti are analyzed.

The second part of the poster provides a contrasting perspective, focusing on the impact of protests on the various experiences of tourists, such as feelings of being unwelcome or perceptions of the destination. An additional theme is protests that are not directly aimed at tourism but take place in tourism areas and indirectly affect visitors through disruptions or changes in the atmosphere of the place.

The poster shows the tourism space as an area of overlapping social, economic, and political orders, in which protest becomes an integral part of the tourist experience and influences the tourism image of a given destination.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism and Community Resilience: Symbiosis and Conflicts in the Anthropocene



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1484 - Illegal Wildlife Consumption In Cross Border Tourism A Crime Script Analysis In Southeast Asia

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The marketing of endangered wildlife products—such as ivory, rhino horn, and pangolin scales—as “local specialties” within legal tourism establishes a symbiotic “tourism-trafficking nexus.” This dynamic exacerbates the concealment and complexity of cross-border law enforcement. Drawing on participant observation and focus group interviews along popular tour routes in Laos and Vietnam, this study integrates Actor-Network Theory (ANT) with Crime Script Analysis to deconstruct the processes and patterns by which tourists contact, purchase, and smuggle contraband. The research reveals a heterogeneous network interwoven by travel agencies, local guides, and product promoters, alongside regulatory blind spots, specific shopping facility configurations, and tourists’ curiosity-driven demand. Within this network, a complete marketing behavioral script is identified: cognitive reframing during transit, situational pressure and inducements within enclosed shopping venues, and concealment tactics to evade customs inspections. The findings suggest that the “enclave effect” of tourism spaces—characterized by a detachment from daily social norms—effectively lowers tourists’ moral inhibitions, facilitating their identity transformation from legal travelers to illegal consumers within specific spatio-temporal contexts. Consequently, the study incorporates Situational Crime Prevention (SCP) and behavioral intervention theories to propose precise governance pathways. These include disrupting the enclosure of shopping spaces, severing the script chain of cognitive reframing, and implementing immediate warning mechanisms to effectively block the illegal wildlife trade.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism Geographies: From Global Dynamics to Local Transformations



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1290 - Walking The Global Local The Camino De Santiago As A Glocal Pilgrimage Landscape

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The Camino de Santiago, historically a Catholic pilgrimage route in northern Spain, has evolved into a globally recognized journey attracting hundreds of thousands of pilgrims annually. This research examines the tension and interplay between globalization and localization along the Camino, exploring how long-standing regional practices are maintained, adapted, and reinterpreted amid expanding global flows of people, capital, and media. Rather than understanding contemporary pilgrimage as a shift from religious devotion to tourism, the study approaches the Camino as a dynamic cultural landscape shaped by multi-scalar interactions.

Drawing on a multi-source qualitative methodology including literature review, media analysis, official pilgrimage statistics, and ethnographic observation conducted during a 2019 pilgrimage, this study employs four analytical vignettes to illustrate everyday glocal dynamics. These include a communal dinner in a rural albergue, a multilingual pilgrim Mass, a commercialized café stop along a high-traffic route, and the symbolic arrival in Santiago de Compostela. Together, these moments reveal how global participation, tourism infrastructure, and digital mediation intersect with locally embedded hospitality practices, ritual traditions, and place-based identities.

The findings suggest that the Camino functions as a glocal pilgrimage, where globalizing processes do not simply displace local meanings but instead reshape how authenticity, sacredness, and community are produced and experienced through embodied mobility. By foregrounding everyday encounters and spatial differentiation along the route, this research challenges binary distinctions between authentic and commodified or sacred and secular pilgrimage. The research contributes to debates in cultural geography, pilgrimage studies, and heritage management, offering insights into the governance and sustainability of globally mobilized yet locally grounded pilgrimage landscapes.



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C24.17-Geography of Tourism, Leisure, and Global Change => Tourism Geography in the Age of Artificial Intelligence: Rethinking Human–Environment Interactions in a Digital Era



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1726 - From Sacred Place To Platformed Experience Algorithmic Visibility And Phygital Mobilities During The 2025 Youth Jubilee In Rome

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In the age of artificial intelligence, large-scale religious events are increasingly platformed, co-produced in phygital environments where material urban settings and AI-mediated infrastructures shape what becomes visible and collectively remembered. This research explores how machine learning-driven recommendation engines act as primary gatekeepers of spatial imaginaries, examining the 2025 Youth Jubilee in Rome as a living laboratory of digitized religious mobility. We analyze how algorithmic curation on platforms like TikTok and Instagram—driven by deep learning models—filters the “sacred” and “profane,” essentially directing the pilgrim’s gaze and movement through personalized content delivery.

The study employs a mixed-method design combining netnography (over 1,600 records from Instagram, Facebook, and TikTok), participant observation in Rome, and survey data on the role of social media in documentation. Netnographic records were systematically coded for geotags, symbols, and engagement metrics to identify “phygital hotspots.” We specifically examine how AI-driven ranking algorithms prioritize certain aestheticized versions of the city, thereby reshaping the traditional pilgrimage route into a series of “platformed moments.”

Findings show that digital documentation primarily performs religious and national belonging within an urban space temporarily sacralized through collective presence and algorithmic visibility. Platform-specific differences are pronounced: TikTok’s ML-driven “For You” feed foregrounds performative registers, while Instagram’s algorithms aestheticize community practice. These dynamics demonstrate that AI is not merely a tool for documentation but an active agent in reshaping human–environment interactions, where the geographic experience is increasingly determined by the predictive logic of algorithmic systems.



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2434 - Uncovering The Multi Label Emotional Landscape Of Dark Tourism A Large Language Model Based Review Analysis

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Dark tourism experiences are theorised as being dominated by negative emotions, yet most empirical studies rely on small, manually coded datasets that obscure how multiple emotions intersect and whose voices prevail. This methodological gap conceals the possibility that sorrow, fear, and anger evoked by curatorial content can deepen—rather than diminish—visitor engagement, thereby depriving destination managers of the affective insight needed to balance commemorative solemnity, educational value, and service quality. An effective, scalable emotion analysis framework that integrates advanced large language models (LLMs) with Plutchik's emotion wheel has been developed and implemented. After 4,228 visitor reviews of the Memorial Hall of the Victims in the Nanjing Massacre were collected, a three-stage LLM-based prompting pipeline—comprising emotion type classification, emotion trigger identification, and intensity scoring—was applied. The results reveal that dark tourism elicits complex affective experiences, with each review expressing an average of 2.3 emotions. These emotions stem equally from environmental and historical factors though the latter usually evoke stronger emotions. Interestingly, while negative emotions are more intense ($M = 0.72$ vs 0.57), positive emotions such as trust, anticipation, and joy occur more frequently. Moreover, the anticipation–trust dyad—Plutchik's “hope”—is the most common pairing, appearing in 70 % of multi emotion reviews and challenging the “purely negative” stereotype. By systematically uncovering complex, co occurring emotions whose manual identification is both labour intensive and difficult to standardise, our LLM driven pipeline advances sentiment analysis in tourism studies. The near real time dashboards it generates deliver actionable metrics for heritage and destination managers, hotels, and other review intensive enterprises, enabling them to distinguish reflective grief from service related dissatisfaction and to refine crowd management, environmental control, interpretive design, and marketing. Moreover, the valence-sensitive emotional landscape of multidimensional affects, along with the novel states emerging, deepens dark tourism affect theory while demonstrating AI's capacity to redistribute interpretive authority across academic and professional communities.



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C24.19-Geomorphology and Society: Past, Present and Future (Jointly with International Association of Geomorphologists) => Geomorphology and Society



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1360 - Micro Topography Indicating Past Human Activities In Hilly Areas Of Japan

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In the hilly areas of Japan, which were exposed to human activities such as the firewood collection, charcoal production, and resource extraction until the late 1950s, traces of past human activities can still be observed today. A typical example is secondary vegetation, including mixed forests and grasslands, which continues to be a major element characterizing the landscape of these hills.

On the other hand, some past human activities involved alterations to the land surface (topographic changes), resulting in the creation of unique structures or artificial landforms. For example, charcoal kiln sites, indicators of past charcoal production, are often found as oval depressions several meters in diameter on the slopes of hills across Japan. Additionally, in hilly regions that have valuable underground resources, remnants of mining and slag heaps can still be seen as small caves or mounds. However, recognition of these topographic traces has historically been low because they are non-natural landforms and are very small in scale.

In recent years, however, the use of high-precision topographic information has made it easier to identify micro-topographies of human origin. First, aerial laser survey data is used to extract micro-topographies that are likely human-made within the target area. Next, field surveys, including drone surveys and ground-based laser measurements, are conducted to confirm the existence of these micro-topographies, and their relationship to human activity is examined based on their distribution and the characteristics of their materials. Identifying such micro-topographies is important for considering landscape formation and environmental degradation under human influence in hilly areas.

In this presentation, I will report on micro-topographies that suggest past human activities, using the hilly areas near Sendai City in northeastern Japan as a case study.



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2440 - Rainfall Aggressiveness And Soil Erosion Risk A Case Study From The Southeastern Part Of The Republic Of Moldova

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Climatic factors play a central role in shaping soil erosion processes, with precipitation characteristics among the most important drivers of surface degradation. The spatial and temporal distribution of rainfall strongly influences erosion intensity, while the concept of rainfall aggressiveness reflects the impact of precipitation's kinetic energy on soil surfaces and slopes. Quantifying rainfall aggressiveness is therefore essential for assessing erosion risk and supporting sustainable land management practices.

As part of the transboundary research project “The impact of European agricultural policies on land use: Romania's experience and lessons for the Republic of Moldova in a European perspective – MapLURoMd”, this study aims to evaluate rainfall aggressiveness in three districts of the Republic of Moldova—Anenii Noi, Ștefan Vodă, and Căușeni—using long-term meteorological data from four representative weather stations: Bălățata, Chișinău, Tiraspol, and Ștefan Vodă. A 30-year climatic dataset was utilized, covering the period recommended by the World Meteorological Organization for optimal analysis of climatic elements. Rainfall erosivity was assessed using two well-established indices: the Modified Fournier Index (MFI) and the Angot Index. These indices allow for the characterization of both the intensity and seasonal distribution of precipitation, providing a comprehensive measure of its potential erosive effect. In addition to calculating the indices, a comparative analysis was conducted to evaluate the differences between the two indices used. By combining long-term meteorological records with standardized erosivity indices, this study offers a robust framework for assessing rainfall-driven erosion risk in southeastern Moldova. The findings provide practical guidance for local authorities, farmers, and environmental planners, contributing to improved land use planning and the sustainable management of soil resources.



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C24.20-Global Change and Human Mobility => Human Mobility and Local Development: Interdependencies and Perspectives



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2022 - Spatiotemporal Dynamics And Driving Mechanisms Of Healthcare Accessibility Using Geospatial Big Data

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Understanding the dynamic supply-demand relationship between healthcare resources and populations is vital for promoting healthcare equity and sustainable urban development, yet existing studies often measure Healthcare Resource Accessibility (HRA) from static perspectives, inadequately reflecting reality. To address this, we develop a framework integrating dynamic population mobility, time-varying travel costs, and fluctuating hospital service capacity to explore spatiotemporal HRA dynamics. Using Changsha, China, as a case study, we first measure local HRA via the Dynamic Gaussian Two-Step Floating Catchment Area (DGa2SFCA) method, then assess city-wide equity over time using the Gini coefficient, and finally quantify driving mechanisms of weekly average HRA using XGBoost regression and SHapley Additive exPlanations (SHAP). Results reveal significant spatiotemporal heterogeneity in HRA, reflecting disparities in residents' access across locations and times. The Gini coefficient ranges from 0.185 to 0.312, indicating substantial temporal variation in overall equity. Travel time to the nearest hospital, mean service capacity of the two nearest hospitals, and population density are the top three drivers. Critically, interaction effects among factors (e.g., housing price and road density) often exceed individual impacts, highlighting complex nonlinear influences. These findings demonstrate that ignoring spatiotemporal dynamics misrepresents accessibility, while our framework provides actionable insights prioritizing travel efficiency, strategic hospital capacity upgrades, and density-informed resource allocation to optimize equity in urban health planning. The methodology offers a replicable approach for evidence-based health equity assessments globally.



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C24.20-Global Change and Human Mobility => Navigating Globility: Human Mobility, Immobility, and Community Wellbeing



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1476 - Spatio Temporal Practices Of Mobile Search Groups For Missing Children

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Child trafficking plunges victimized families into a state of “ambiguous loss,” characterized by agonizing uncertainty and prolonged psychological trauma. In response to this predicament, “Mobile Search Groups” (MSGs)—a grassroots initiative where parents drive vehicles emblazoned with missing children’s posters across vast regions—have emerged as a distinct form of bottom-up mobility. Drawing on extensive participant observation and in-depth interviews with 12 parents, this study employs the Dual Process Model (DPM) to critically analyze the organizational dynamics and spatio-temporal behaviors of these groups. The research identifies an evolutionary trajectory of three organizational modes: atomized self-organization, collective collaborative participation, and capital-injected operations. These modes do not exist in isolation but shift dynamically in response to family economic conditions and the evolution of digital media technologies. Crucially, in an era where digital search methods have become dominant, MSGs offer a unique “embodied” spatial practice. Our findings suggest that this physical, labor-intensive mobility enables parents to establish a “place-based” imaginary connection with their missing children, thereby facilitating a psychological transition from a “Loss Orientation” to a “Restoration Orientation.” By elucidating how mobility functions as an active coping strategy for trauma, this study highlights the intricate interplay between movement, emotion, and resilience. It offers significant contributions to understanding the lived experiences of marginalized communities, providing a geographical perspective on how individuals navigate grief and reconstruct agency through spatial action.



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C24.21-Global Understanding => Global Perspectives on Climate Risk and Vulnerability: Bridging Science, Policy, and Practice



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1129 - Assessing Flood Vulnerability With Artificial Intelligence A Polish Case Study

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Background

Municipal disaster risk reduction requires flood vulnerability assessments that are timely, comparable and easy to interpret. In practice, municipal datasets are often incomplete or outdated, and expert judgements may diverge, especially for social sensitivity and lack of resilience. We test whether a retrieval-augmented large language model (RAG-LLM), constrained to a curated evidence base, can generate consistent and evidence-traceable first-pass vulnerability ratings for Polish municipalities.

Materials and Methods

We applied the workflow to an existing indicator dataset for 136 municipalities in the Mazovia region (Poland), organised into three components: exposure, sensitivity, and lack of resilience. A RAG-LLM pipeline (NotebookLM-based) was restricted to a curated set of flood risk and vulnerability literature and received structured indicators as input. For each municipality, the system produced continuous 0–1 component scores and an overall vulnerability score (higher = higher vulnerability), together with a short narrative justification explicitly referencing the supplied sources and indicator values. An independent expert baseline was developed for a stratified subset of six municipalities spanning the observed range of indicator patterns. We compared overall and component-level agreement, alignment of highlighted drivers, and analyst effort.

Results

The AI recovered key determinants emphasised by experts (exposure, social sensitivity, and lack of resilience) and reduced preparation effort relative to expert-only workflows. For the six-municipality validation subset, overall vulnerability differed from expert ratings by 0.011-0.105 (mean absolute difference 0.065). Agreement was highest for exposure and lower for sensitivity and lack of resilience (mean absolute differences: 0.107, 0.147 and 0.172). The model most often underestimated vulnerability when sensitivity and lack of resilience indicators were prominent.

Conclusions

A literature-constrained RAG-LLM can provide a reproducible, auditable decision-support layer for municipal prioritisation of flood vulnerability, with outputs traceable to the underlying evidence and indicator values. Before operational use, the approach should be calibrated against local datasets and evaluated across more municipalities to mitigate underestimation and ensure temporal stability.

Acknowledgments:

This research was funded by the National Science Centre in Poland under the OPUS call in the Weave programme [2023/51/I/HS4/00255] and co-financed by the Polish National Agency for Academic Exchange, and by the Austrian Science Fund (FWF) [grant DOI: 10.55776/PIN9502423].



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1694 - Integrating Exposure Sensitivity And Adaptive Capacity A Methodological Approach To Social Vulnerability To Floods

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Background/Hypothesis

Social vulnerability to floods is defined as a set of individual and group conditions shaping the capacity of populations in a given areas to prepare for, cope with, mitigate and recover from flood events. This study aims to systematize approaches to defining and measuring social vulnerability to floods and to identify methodological solutions applicable in municipal-level comparative analyses.

Materials and Methods

A systematized literature review on social vulnerability to floods was conducted. Publications from 1990–2025 were identified in scientific databases and repositories (Web of Science, Google Scholar) using the following keywords: social vulnerability, flood vulnerability, flood risk, adaptive capacity, and sensitivity. The analysis included studies that (1) defined social vulnerability or its components, (2) proposed sets of indicators, or (3) described measurement tools.

Results

Municipal-level studies highlight the importance of integrating spatial data (hazard zones, residential development, population distribution) with socio-demographic data (e.g., age, gender, health status), and increasingly with information on risk awareness and flood preparedness. Measurement approaches are dominated by indicator-based tools, although their construction varies substantially, particularly regarding normalization, weighting, aggregation, and validation procedures.

Conclusions

The literature review confirms that no universal standard exists for measuring social vulnerability to floods, with results strongly depending on definitions, indicator selection, and aggregation methods. An integrated approach, balancing exposure with vulnerability and community resilience, appears most promising. The review provides a basis for developing a social vulnerability index, implementing it locally, and formulating recommendations to mitigate flood impacts.

Acknowledgements

This research was funded by the National Science Centre in Poland under the OPUS call in the Weave programme [2023/51/I/HS4/00255] and co-financed by the Polish National Agency for Academic Exchange.



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C24.22-Hazards and Risks => Compound Weather-Related Hazards in a Changing World: Geographical Spatio-Temporal Analysis



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1965 - Towards Targeted Flood Risk Management In Serbia Evidence From A Municipal Level Assessment Of Population Vulnerability And Exposure

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Floods are the most frequent natural disasters in Serbia and represent a significant threat to population, settlements, and infrastructure. This study aims to identify flood risk index for municipalities in Serbia by integrating two main components—a social vulnerability index and flood exposure. First, based on 13 indicators, a composite vulnerability index was constructed. The next step involved computation of the share of river flood-prone areas using the River Flood Hazard Maps for Europe and the Mediterranean Basin. Calculated overall flood risk index was classified into five categories ranging from very low to very high risk. The statistical analyses used to derive population vulnerability were conducted using Jamovi open statistical software, while the assessment of flood exposure and the cartographic visualization of results were performed in ArcGIS Pro. The results indicate that the municipalities where the population is at highest risk of flooding are predominantly located in the northern part of Serbia, particularly in border areas with neighboring countries, as well as in some central regions following the courses of major rivers. The results further suggest that flood exposure has a stronger influence on overall flood risk than population vulnerability. By identifying high-risk municipalities and the dominant drivers of flood risk, this study provides a valuable base for establishing sustainable flood risk management system on national, regional, and local level involving planning, coordination, and resources before, during, and after events in order to reduce risks and impacts.



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2114 - Validating Typhoon Induced Rainstorm Flood Inundation Modelling Using Insurance Claims And Water Level Gauge Observations A Case Study In Ningbo China

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Increasing risks from tropical cyclone (TC)-induced rainstorm flooding under climate change and land subsidence underscore the critical need for robust two-dimensional (2D) hydrodynamic modelling to capture complex spatiotemporal dynamics. However, the successful application of such models is often limited by the scarcity of high-quality, spatially accurate validation data. Therefore, it is crucial to develop advanced and reliable methods for validating flood models. In this study, we bridge this gap by developing an integrated validation framework for the FloodMap-HydroInundation2D model, utilizing both traditional water level gauge records and insurance claims data following Typhoon Co-may (2025) in Ningbo, China. Simulated water depths and inundation extents generally align with both traditional water level gauge records and flood damage data provided by the People's Insurance Company (Group) of China Limited (PICC). Furthermore, to reduce spatial geolocation uncertainties and approximate building footprints, we employed circular buffers (with radii of 50–200 m) around claim and gauge locations. Validation accuracy was rigorously assessed by comparing observational records against simulated statistics within these buffers, specifically quantifying the mean, maximum, and distance-decay weighted depth values. Our findings establish a novel, data-driven framework for model calibration in data-sparse regions, offering vital insights for facilitating more proactive coastal flood risk management.



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3247 - Spatiotemporal Analysis Of Climate Variability And Fire Danger Indices For Wildfire Risk Modelling In Mediterranean Type Ecosystems

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Background/Hypothesis

Wildfire regimes in Mediterranean-type ecosystems are strongly shaped by climate variability, vegetation dynamics, and fuel conditions. This study evaluates the Fire Danger Index as a predictor of wildfire occurrence and tests whether integrating climate oscillations and vegetation indicators improves wildfire risk characterisation.

Materials and Methods

Wildfire records from 2021 to 2025 were analysed alongside climatic variables, El Niño–Southern Oscillation phases, vegetation condition derived from the Normalised Difference Vegetation Index, and land cover data. Spatiotemporal methods were applied to assess seasonal patterns, spatial clustering, and relationships between fire occurrence and environmental drivers.

Results

A clear seasonal fire regime was identified, with peak activity during the hot, dry summer months (January–March). The Fire Danger Index showed strong correspondence with observed fire occurrence, confirming its value as an indicator of elevated fire risk. Climate variability exerted a significant but spatially heterogeneous influence: the 2024 El Niño phase coincided with an extreme fire season, with 710 fires concentrated in key subregions, whereas La Niña conditions were associated with more dispersed fire patterns. Vegetation type strongly influenced fire susceptibility, with fynbos ecosystems accounting for 45.3% of fires. While lower vegetation index values were generally linked to increased fire occurrence, fires also occurred under moderate vegetation conditions, highlighting the combined role of fuel load and fuel moisture.

Conclusions

The Fire Danger Index is an effective indicator of elevated wildfire risk in Mediterranean-type environments. However, its predictive capacity is enhanced when integrated with climate oscillation indicators and vegetation-based fuel assessments. These findings support more adaptive, spatially targeted wildfire management strategies under increasing climate variability.



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3251 - Physical Geography Climate Change And The Making Of Flood Disaster In The Indus River System In Pakistan

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Background

In the contemporary times, floods are not just caused by the physical factors but also socio-political ones. To understand this better, it is imperative to first establish that floods are a compound process involving physical geography, climate factors and governance. Particularly, floods which originate in immense river systems like the Indus River System. The Indus River System (IRS) is a geophysical entity which is important to South Asia and Pakistan. The IRS stretches from the glaciers of Karakoram and Hindukush through the vast plains of Punjab going all the way to the deltaic margins of Sindh and culminates at the Arabian Sea. This paper explores how the floods in Pakistan are not only caused by climate change and changing monsoon patterns but the reason why one-third of Pakistan's population is impacted almost every year by these floods, is compound vulnerability.

Conceptual Framework and Methods

Using hydro-social and socio-ecological frameworks, this work conceptualises flooding in the Indus River as an outcome of multiple intersecting factors. These include, accelerating glacial melt and monsoon variability, the Indus Basin Irrigation System (IBIS) which still holds on to a colonial era infrastructure which hinders natural drainage and amplifies flood exposure. Finally, there is the governance system which struggles to coordinate across provinces with different geographical landscapes.

The research examines three distinct flood typologies within a single hydrological system: flash and glacial lake outburst flooding in Khyber Pakhtunkhwa; slow-onset fluvial inundation across the Punjab plains; and compound pluvial-fluvial flooding in lower Sindh. The argument is drawn through qualitative inquiry, combining primary interview data gathered across differing flood geographies with critical analysis of existing governance debates and policy frameworks.

Results and Conclusions

The paper will explain how national adaptation frameworks produce differing outcomes when confronted with distinct physical and governance geographies. The research findings are that governance responses in Pakistan have consistently underestimated the geographical dimensions of flood risk, which has produced further adaptation gaps which are not linear or incidental failures but structurally rooted outcomes of treating a geographically diverse basin as a uniform policy space.



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C24.22-Hazards and Risks => Cryospheric Hazards in a Changing Climate: Global Perspectives on Risk, Monitoring, and Adaptation



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3054 - Developing A Climate Change Adaptation Baseline Using Climate Indices For The North West Province South Africa.

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Climate change adaptation is essential for reducing vulnerability and building resilience to increasing climate risks such as heatwaves, droughts, and extreme rainfall events. At the national level, South Africa's National Climate Change Adaptation Strategy (NCCAS) and related policy frameworks provide broad guidance for adaptation across sectors and spheres of government, including provinces and municipalities. Climate change adaptation planning requires robust spatial analysis to identify current climate risk patterns to support long-term monitoring. Moreover, even where climate change strategies exist, baseline climate risk assessments and clear metrics for monitoring progress are often absent or not comparable across jurisdictions, leaving gaps in the evidence needed for targeted adaptation action. These gaps highlight the need for a spatially explicit adaptation baseline that captures current climate hazard patterns and vulnerabilities, providing a critical reference point for monitoring adaptation effectiveness and guiding future planning across the North West Province. Therefore, this study aims to develop a climate change adaptation baseline for the North West Province using spatial climate indicators. This study will focus on three climate risks, namely: heatwaves, droughts and extreme rainfall, which are recognised as key drivers of socio-ecological vulnerability in Southern Africa. The climate data will be obtained from ERA5 reanalysis, which provides daily gridded temperature and rainfall data. This study period will be from 1990 to 2025. Using the climdex R package and the ASSA climate index methodology, a suite of extreme climate indices will be calculated to quantify heatwaves, droughts and extreme rainfall. All indices will be aggregated to municipal boundaries and integrated with socio-economic data from Statistics South Africa to produce a composite climate-hazard baseline. The proposed baseline will provide a critical reference framework for monitoring future changes in climate risk and evaluating adaptation progress. This study will contribute to strengthening provincial adaptation planning and align with emerging adaptation monitoring frameworks.



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C24.23-Health and Environment => Access to Healthcare for Disadvantaged Groups



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2202 - Geographic And Sociodemographic Factors In Mobile Health Use By Persons Living With Drug Susceptible Tuberculosis In Disadvantaged Communities Of South Africa

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Background

Mobile health (mHealth) interventions have emerged as promising to improve healthcare access, given the high mobile phone penetration in LMICs. The use of video-observed treatment (VOT), for example, can support healthcare by supporting treatment adherence and delivering health information remotely. This study assessed whether geographic and sociodemographic factors impact the use of VOT by persons living with drug-susceptible tuberculosis (DS-TB) in disadvantaged communities of South Africa.

Materials and Methods

An exploratory study was conducted among 72 persons on DS-TB treatment enrolled in a VOT mHealth intervention across 12 health facilities in Gqeberha, Nelson Mandela Bay. The dependent variable was VOT use, categorized as none, low to moderate, and high. Independent variables included clinic geographic location and the sociodemographic variables of age, gender, income source, and educational level. Associations were explored using contingency tables and Chi-square and Fisher's exact tests. We also explored the level of VOT use and treatment outcomes.

Results

VOT use varied by clinic geolocation, with higher proportions of high VOT use in West End and Schauderville, with no participation in Gqebera Township and Missionvale. Masakhane and Walmer 14th Avenue showed VOT participation across all categories. High VOT use was exclusively associated with favourable DS-TB treatment outcomes. Age, gender, education, and income were not significantly associated with the level of VOT use.

Conclusions

High VOT use was strongly associated with favourable DS-TB treatment outcomes, while clinic-level heterogeneity suggests that health system factors have a greater impact than sociodemographic factors on the level of VOT use. VOT implementation could impact greater healthcare access, but will require addressing clinic-level barriers. Equitable care will demand alternatives for disadvantaged persons on DS-TB treatment who are unable or unwilling to use mHealth such as VOT.



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C24.23-Health and Environment => Healthscapes in Transition: Spatial Contexts of Health and Wellbeing



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1457 - Social Determinants Of Health Vulnerability A Household Level Analysis In Awadh Region Of Uttar Pradesh India

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Health vulnerability is unevenly distributed and strongly shaped by household-level social, economic, and infrastructural conditions. In regions marked by persistent inequality, households function as key spaces where health risks are produced and managed. The Awadh region of northern India exhibits considerable socio-economic disparities and uneven access to basic services, making it a relevant context for examining household-level health vulnerability. This study hypothesises that variations in household level socio economic factors significantly influence regional patterns of health vulnerability. A Household Health Vulnerability Index was constructed using indicators related to demographic characteristics, socioeconomic status, education, housing and sanitation conditions, healthcare access, and social marginalisation. Household survey data were combined with secondary sources and standardised using a multi-criteria decision approach. Geographic information system-based mapping was used to spatially link household vulnerability scores with administrative boundaries, enabling district-level aggregation and visualisation. With scores ranging from 0.26 to 0.66, the Health Vulnerability Index shows clear inter-district disparities throughout the Awadh region. While districts like Bahraich, Barabanki, and Unnao fall into the high vulnerability category due to poor maternal care, high malnutrition, inadequate sanitation, and limited health facilities, urban districts like Lucknow and Kanpur exhibit low vulnerability due to better maternal and child health outcomes, improved sanitation, and robust healthcare infrastructure. Due to inconsistent performance across index components, the majority of districts exhibit moderate vulnerability. Overall, the findings reveal a distinct variation in health vulnerability between rural and urban areas, shaped by cumulative deficits in household and health conditions. The study highlights the importance of household-level analysis for understanding spatial health inequalities. Improving health outcomes in Awadh requires policies that address household living conditions, healthcare accessibility, and social support. The framework provides a replicable approach for assessing household-level health vulnerability in similar socio-spatial contexts.



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C24.23-Health and Environment => Trafficking in Different Targets: Geographies of Illicit Mobility



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2049 - Informal Transport In Fengjie China Examining Its Formation Through The Lens Of Supply Demand And Built Environment

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Informal transport, referring to mobility services operating outside official regulatory frameworks, is frequently associated with significant safety concerns due to inadequate oversight and the absence of standardized infrastructure. While existing scholarship has extensively examined informal transport in various developing regions, research within the Chinese context remains limited, particularly regarding the integrated analysis of its formation from both demand and supply perspectives. This study addresses this gap by focusing on Fengjie, a typical county-level city in Chongqing, China. Through field surveys, GPS trajectory analysis, and spatial mapping, we investigate the operational patterns and spatial distribution of informal transport modes, such as unregistered minibuses and motorcycle taxis. Employing a demand–supply analytical framework, the study identifies key factors driving the prevalence of these services, including gaps in formal public transit coverage, terrain-related accessibility challenges, and localized travel needs.

The findings underscore the substantial influence of the built environment—encompassing road network design, land-use mix, and connectivity—on the emergence and persistence of informal transport. Areas with poor formal transit integration, steep topography, and high population density exhibit a higher dependence on informal modes. Based on these results, the paper proposes targeted planning strategies, such as enhancing first- and last-mile connectivity, optimizing street network design, and integrating flexible transit solutions, to reduce reliance on informal transport. By linking spatial planning with transport governance, this research offers evidence-based insights for fostering safer and more sustainable urban mobility in China’s small and medium-sized cities



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C24.24-History of Geography => Histories of/Ideas in Geography for Peace



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2571 - Ukrainian Regions' Adaptability In The Face Of War

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Since 2022, Ukraine is under a full-scale Russian invasion. War affected every part of the country, affecting its demography, economy, and environment. Warfare and internal displacement of people and businesses forced regions to withstand or adapt to new conditions.

Resilience theory is used to explain countries, regions, or cities' abilities of whitstanding or adapting to shocks. Using that theory, the abilities of regions to withstand war-induced shocks and examples of the adaptability of oblasts to new situations will be presented. Using several data points, a resilience index was created for the years 2011-2021. For 2021, the resilience index was followed by the cluster analysis. This analysis categorized the oblasts into four resilience levels: very low, low, medium, and high resilience. Only Kyiv city was identified as a unit with a high resilience.

The resilience index (for 2021) was compared with the dynamics of the following data: 1) number of active enterprises, 2) number of employed in business enterprises, 3) capital investments, 4) turnover of enterprises for 2022-2024. The qualitative methods were used to explain the economic transformations. The relocation of enterprises, projects supporting employment, entrepreneurship, foreign aid, the activity of charity organizations, and business ability to cope were highlighted as key factors influencing oblasts' adaptation and resilience.



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**C24.25-Informality, Social Change and Development
=> Urban socio-spatial restructuring and governance in
the era of globalization**



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1628 - Inequality In Bridging The Digital Divide Among Older Adults Across 115 Chinese Cities During The Public Health Emergencies

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China is currently undergoing concurrent rapid transitions of population aging and societal digitalization. While internet penetration has increased significantly, digital access among older adults remains a substantial challenge, creating a pronounced “gray digital divide.” Accelerating efforts to bridge this divide is crucial not only for fostering social inclusion but also for enhancing the physical and mental health and overall well-being of the elderly population. This study utilizes the quasi-natural experiment created by the widespread implementation of Digital Epidemic Prevention (DEP) measures during the COVID-19 pandemic. It investigates the critical role of social supportive environments in facilitating digital inclusion for older adults. Based on a large-scale survey conducted between July and September 2020, encompassing 12,500 individuals aged 60 and above across 115 Chinese cities, our analysis reveals a notable surge in digital access among seniors during this period. The increase exceeded the anticipated pre-pandemic growth trend by 121.88%. The findings demonstrate that DEP environment significantly improved both access to and usage of digital technologies within this demographic. However, the study also uncovers persistent and significant disparities. Internet access was strongly correlated with key individual socioeconomic characteristics, including age, marital status, educational attainment, and income level. Furthermore, geographical determinants such as urban-rural residence and regional development gaps continued to be influential factors. This research provides valuable empirical insights and policy implications for designing targeted, multidimensional interventions aimed at accelerating the reduction of the digital divide for older adults in China and other societies experiencing similar demographic and technological shifts.



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**C24.26-International Geography Olympiad
Commission => Global Differences and Challenges in
Geography Teaching and Education Through National
and International Geography Olympiads**



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2109 - Spatial Differences And Patterns In Geographical Education In Croatia Based On Analysis And Comparison Of Results Of Croatian National Geography Olympiads

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The Geography Olympiad is a disciplinary competition that serves as a tool for assessing geographical knowledge and skills at various spatial levels. The results of measuring the acquisition of geographical knowledge and the development of geographical skills show similar trends. The differences in the level of geographical literacy between Croatian students and their peers in the European Union and worldwide have decreased, but disparities within Croatia have increased, as measured by the participation and achievements of students at the three levels of national geography olympiads. The main aim of this research was to determine spatial differences in the level of geographical literacy among Croatian counties, using the example of geography olympiads. To compare regional self-government units, the geographical competitiveness index and the geographical performance index were used, calculated for primary schools, high schools, vocational schools, and for secondary schools overall.

The following hypotheses were tested:

1. At all levels of competition, according to the geographical competitiveness index, four regional self-government units whose headquarters are in the four macro-regional centres are in the lead.
2. Regional self-government units with a higher share of competitors at the state level achieve a higher geographical performance index.

The research has shown that in recent years, especially in the post-pandemic period, spatial differences have been increasing between NUTS 3 regions (counties) in Croatia. At all levels of competition, from school to national, greater representation and better results were expected from students in those counties with a larger share of the total number of students in individual grades or competition categories.



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C24.29-Land Degradation and Desertification => Land Degradation. Current Knowledge, Scientific Challenges and Solutions



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1530 - Dynamic Monitoring And Image Prediction Of Grassland Blowouts Based On Deep Learning A Case Study Of Hulunbuir Grassland In China

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Blowouts, recognized as typical aeolian landforms in sandy grasslands, serve as a critical morphological indicator for accurately assessing the process and degree of grassland desertification. Traditional monitoring methodologies, which predominantly depend on field-based measurements and manual visual interpretation of remote sensing imagery, face significant limitations in conducting efficient and extensive spatial surveys. To address this gap, this study developed an integrated deep learning framework applied to the Hulunbuir sandy grassland in China. The framework employed semantic segmentation models, specifically comparing U-Net, R2U-Net, and Attention U-Net, to automatically identify blowouts and extract key morphological parameters from remote sensing data. Subsequent analysis utilized a predictive model based on ConvLSTM architecture to forecast future spatiotemporal trends. The performance validation confirmed the superior capability of the Attention U-Net model for this task. Temporal analysis of imagery from 2004, 2011, and 2019 revealed a clear increasing trend in both blowout number and total area over the 15-year period, with notable shifts in growth rates around 2011. Spatially, the development intensity and morphological characteristics (e.g., aspect ratio) varied significantly: blowouts near human settlements and roads showed the most rapid development, whereas areas along riverbanks and at the edges of sandy dunes exhibited distinct, slower-paced evolutionary patterns. Predictive modeling for the period 2010–2030 indicates a persistent trend of blowout expansion, including processes of new formation, enlargement, and merging. Notably, this active development phase appears to continue even in regions with minimal anthropogenic disturbance, suggesting that the inherent dynamics of blowout evolution may exhibit a degree of resilience or limited immediate sensitivity to broader climatic fluctuations within the observed timeframe.



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1545 - How Does Urbanisation Shape River Hydromorphological State Evidence From The Kraków And Riga Regions

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In river ecosystems, environmental assessments should cover both biotic elements and abiotic factors that significantly impact habitat quality. River valleys are among the most valuable landscape features and are currently undergoing significant transformation as a result of human activity. This study aimed to evaluate the extent of human interference in the natural environment of rivers in catchment areas with varying levels of human impact, by analysing the hydromorphological status and quality of river habitats. The research was conducted in accordance with the British River Habitat Survey (RHS) guidelines. Three rivers were analysed: Marupite (Latvia), Tervete (Latvia) and Rudawa (Poland). On the Marupite River, which flows through an urbanised catchment area, two 500-metre-long study sections were designated. On the Tervete River, which is located in an agricultural catchment area, the study was conducted on three sections: upper, middle and lower. On the Rudawa River, three sections representing different land uses were designated: urban in the city of Krakow, agricultural, and forest in the upper reaches of the river. Fieldwork aimed to identify and compare the degree of hydromorphological transformation depending on catchment area type. The results obtained indicate that the highest quality river habitats (class 1) are found in naturally occurring sections located in forested areas or areas that have been less affected by human activity. Conversely, moderate habitat quality (class 3) is characteristic of urban and agricultural sections of Latvian and Polish rivers, where significant anthropogenic pressure exists in the form of riverbed regulation, simplified habitat structures and changes to the riparian zone. Comparing Polish and Latvian rivers confirms that land use in the catchment area significantly impacts the hydromorphological quality of rivers, regardless of geographical region.



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2493 - Estimating Annual Soil Loss By Water Erosion In The South Eastern Regions Of The Republic Of Moldova

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Modern technology has introduced powerful tools such as advanced modeling techniques and Geographic Information Systems (GIS) that enhance decision-making in environmental management. The literature on this topic includes studies that employ both simple models, such as the Universal Soil Loss Equation (USLE), and more complex ones. As part of the transboundary research project “The impact of European agricultural policies on land use: Romania’s experience and lessons for the Republic of Moldova in a European perspective – MapLURoMd”, this study aims to evaluate the risks of water erosion using a modified version of the USLE through GIS-USLE integration.

An effective assessment of soil loss using our approach requires spatially distributed data describing various terrain parameters, including topography, rainfall, soil types, vegetation, and land use. We have used both open-source databases (SRTM 2013, ISRIC-WISE 2008, CORINE 2023, AGRI4CAST 2023.01) and regional data (IPOT).

Soil erosion in Moldova is frequently as high as 30 tons per hectare per year, with more than 1.4 million hectares at risk of erosion (Summer & Diernhof, 2003). The model applied in this study estimated annual soil loss in the Anenii Noi, Causeni, and Stefan-Voda districts to range from 0 to >40 t/ha/yr, with most areas (59.1%) having negligible soil loss (0-3 t/ha/yr). The highest erosion rates occur on steep slopes with agricultural and herbaceous vegetation cover, which comprise more than 25% of the studied territory. Our findings demonstrate that GIS serves as an effective tool for identifying and analyzing critical erosion-prone regions, which is extremely important for designing anti-erosion measures required for the efficient implementation of the agricultural policy in the Republic of Moldova.



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C24.30-Land Use and Land Cover Change => Innovative Methods for Extracting and Utilising Historical LULC Data



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1158 - Historical Spatial Patterns And Clustering Of Pre Afforestation Land Use In Post War Plantation Areas Of Japan An Analysis Based On The 1960 World Census Of Agriculture And Forestry

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Background / Hypothesis

Post-war plantation forests in Japan are now reaching harvesting age, making post-harvest land-use decisions increasingly important. Natural regeneration after harvesting is strongly influenced by pre-afforestation land-use through soil seed banks. However, previous studies on pre-afforestation land-use have been largely limited to local case studies. This study hypothesizes that pre-afforestation land-use prior to post-war afforestation formed non-random spatial structures shaped by historical land-use and afforestation policies, resulting in significant spatial autocorrelation and regional clustering across Japan.

Materials and Methods

This study uses the 1960 World Census of Agriculture and Forestry, which recorded pre-afforestation land-use for approximately 10,000 former municipalities. Census records were digitized and integrated with municipal polygon data. Pre-afforestation land-use was classified into three types: previously planted forest, logged natural forest, and non-forest land. Global Moran's I was calculated to assess overall spatial autocorrelation, while Getis-Ord Gi* statistics were applied to identify local hot and cold spots. Additionally, municipalities were classified using k-means clustering.

Results

Global Moran's I revealed statistically significant positive spatial autocorrelation for all pre-afforestation land-use categories, indicating clear non-random spatial patterns. Gi* analysis identified distinct hotspot regions, including Kyushu, Shikoku, the Kii Peninsula, and parts of eastern Japan, while cold spots were more dispersed and frequently located in lowland plains. Clustering analysis further identified five regional types characterized by contrasting combinations of total afforestation area and pre-afforestation land-use proportions, reflecting differing historical afforestation strategies such as conversions of remote natural forests and former fuelwood forests.

Conclusions

These results provide robust statistical evidence that pre-afforestation land-use in Japan exhibited clear spatial structures and regional typologies prior to post-war plantation expansion. By demonstrating how historical land-use patterns shaped national-scale afforestation landscapes, this study offers an important geographical baseline for evaluating regeneration potential, forest management challenges, and future land-use planning.



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2614 - Assessment Of Land Use In Natura 2000 Net In The Autonomous Community Of Extremadura

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The work will present the research developed within the framework of a research collaboration agreement for the elaboration of a study on the “redelimitation and characterization of the Natura 2000 Network in the Autonomous Community of Extremadura. The main objective of this research is to comprehensively review the management of the sites included in the Natura 2000 Network in Extremadura.

The implementation of conservation strategies will be comparatively evaluated in order to identify the main challenges and areas for improvement. Through the study of scientific and technical documentation and other documents from official bodies, actions will be proposed to make conservation and development compatible in these areas.

Special Protection Areas for Birds (SPAs) are natural areas designated under the Birds Directive (2009/147/EC), to ensure the conservation of wild bird species and their habitats. These areas are part of the Natura 2000 Network, a key instrument of the European Union’s environmental policy. This study analyses land use within the SPAs of Extremadura to assess territorial transformations. For this purpose, data from the CORINE Land Cover (CLC) project was used to provide information on land occupation at the European scale. The analysis was carried out using Geographic Information Systems (GIS) tools, specifically the Arcgis 10.5 software, which allowed for the classification and mapping of the different types of land use within SPA boundaries. The results reveal a coexistence between traditional land uses, such as dehesa systems and extensive agriculture. The study highlights the need for territorial planning that aligns with conservation objectives, as well as the importance of integrating spatial analysis tools into environmental management processes



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C24.30-Land Use and Land Cover Change => Land Use/Land Cover Change Driving Forces and Impacts



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1321 - Do Afforestation Projects Increase Core Forests Evidence From The Chinese Loess Plateau

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The spatial pattern of forests impacts on biodiversity, stability and sustainability of forest ecosystems. Afforestation and reforestation projects have massively increased forested areas on the Chinese Loess Plateau, however, the spatial pattern of the new and old forests, as well as their interaction, remains unknown. Here we study the spatiotemporal dynamics of old and new forests for the period 2001–2016 by using the data set based on MODIS satellite at a 250 m spatial resolution and applied the Morphological Spatial Pattern Analysis (MSPA) which is a segmentation technique developed to identify spatial patterns of connected features. We found that 84.21% of the old forests existed throughout the study period. Moreover, core forests (defined as a forest area which is surrounded by other forest areas) significantly increased (2 585 km² yr⁻¹, in total 39 597 km²). Two ecological restoration projects have left clear footprints on the forest landscape of the Loess Plateau: (1) The Natural Forest Conservation Project, aiming at expanding old forest, has resulted in the establishment of considerable areas of new forest surrounding old forest. Consequently, this has promoted new core forest areas to emerge. (2) The Grain for Green Project has mainly caused a fragmented landscape of forest islets which gradually connect to core forest areas. The general increase in core forest areas can be considered an ecological improvement, and the assessment method presented here may guide stakeholders in measuring the success of forest restoration activities that goes beyond a classical quantification of forest cover.



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1363 - Driving Forces Behind Spatial Evolution Patterns Of Rural Settlements—a Case Study Of Liaocheng Shandong Province China

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With the rapid urbanization in China, rural settlements have shown signs of decline due to urban land encroachment and rural hollowing-out. Current problems related to rural settlements, such as low efficiency and chaotic layout, are seriously impeding the implementation of the rural revitalization strategy in China. To scientifically guide the optimization and reconstruction of rural space, it is urgent to uncover the driving forces behind the spatial evolution patterns of rural settlements.

Taking Liaocheng as a case study, 14 types of evolution patterns of rural settlements during 1982-2022 were summarized based on five basic patterns: independence, merger, extinction, emergence, and urban annexation. A multivariate logistic regression model was used to identify the driving forces behind the evolution patterns.

The results showed that:

- (1) The diversified evolution patterns of rural settlements were characterized by the coexistence of stable maintenance and phased expansion. Both independence-independence and merger-independence patterns were dominant, reflecting that most settlements remained independent for a long time or tended to be stable after an initial expansion.
- (2) The evolution patterns of rural settlements differed significantly in terms of settlement area, the shortest distance between settlements, and the shortest distance from urban areas. Generally, the settlement scale of all evolution patterns increased. The shortest distance between settlements of both the independent-independent and merged-independent patterns was significantly shortened, while the merged-merged pattern tended to be spatially scattered. The shortest distance from urban areas was clearly reduced for the independent-urban annexation and merger-urban annexation patterns.
- (3) The factors, including settlement scale, inter-settlement distance, proximity to urban areas, and traffic accessibility, were found to influence the evolution patterns. Settlements with a larger scale and a shorter distance to other settlements were more likely to merge. The distance of a settlement from the urban area significantly affected the patterns of urban annexation. Settlements adjacent to the main traffic arteries were more likely to merge or move closer to the urban area. However, the traffic factors in the independent-independent and independent-merging patterns were not significant.



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1531 - Response Of Vegetation Productivity To Climate Change In Pakistan Across 2001 2022

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The land territory of Pakistan extends from the coast area towards the Himalayas, rising vertically by over 8,600 meters within a distance of 1,600 kilometers. The net primary productivity (NPP) there have been undergoing the impacts of climate change, however the main climatic driving forces on NPP in different regions and the possible change direction of NPP in future remain unclear. Using the ERA5-Land climate reanalysis data and MOD17A3H NPP data and through partial regression and moving correlation analyses, we identified the main climatic drivers to the NPP and assessed the potential climatic forces faced by the local vegetation in future. Our results were as follows: (1) The NPP showed an overall increasing trend across Pakistan from 2001 to 2022. (2) The areas where the change of NPP driven mainly by temperature and the NPP benefited from the temperature change, located in the northeast part of Pakistan, approximately in the north of the latitude 35°N and the east of the longitude 72°E. Within the areas, the NPP increased with temperature change intensified over time in the region higher than the elevation of about 3,500 m a.s.l., whereas diminished lower than this elevation. (3) The areas where the change trend of NPP mainly driven and meanwhile promoted by precipitation situated in the middle to southern part of Pakistan. There, the increase of NPP driven by precipitation were gradually intensified over time in the region approximately between 32°N and 26°N, while diminished in the region nearby Peshawar, the northeast part of the Potwar Plateau and the most southern part of the Sindh. Our findings indicted a spatial differentiation in the responses of NPP to climate change. If the climate change is going on as present, the vegetation distributed in the most southern part of Sindh and the northern mountain area below 3,500 m a.s.l., may undergo risks of degradation.



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1632 - A Century Of Lake Wetlands Alteration In The Yangtze River Plain China Human Impacts And Hydrological Disconnection Dynamics

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Human activities have significantly transformed lake wetland ecosystems, requiring the integration of various data types to effectively measure long-term changes, discern potential drivers, and establish a baseline condition. Using historical topographic maps and Landsat imagery, we reconstructed the centennial dynamics of the lake wetlands in the Yangtze River Plain, and examined the roles of land use and hydrological connectivity changes. Our results reveal a loss of 45.6% (~11859.5 km²) of the lake wetlands area over the past century, mainly due to agricultural expansion and urbanization. The most dramatic shrinkage occurred between the 1930s and 1970s, followed by a period of stabilization and a slight recovery after the 2010s. However, widespread hydrological isolation continues to threaten the remaining wetlands. A total of 130 lakes are now disconnected from the Yangtze River, resulting in the decrease in the proportion of floodplain marsh from 28.3% in the 1930s to 8.0% in the 2020s. Furthermore, over 260 sub-lakes larger than 1 km² (with a total area of 1276.4 km²) are experiencing a loss of connectivity with their parent lakes currently. The study documents the significant and persistent impacts of human-caused connectivity loss on wetland ecosystems, thereby providing essential historical evidence to inform and strengthen conservation and restoration initiatives on the Yangtze River Plain.



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1646 - The Hidden Carbon Debt Of Illegal Logging In China

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Forest ecosystems are pivotal to global climate mitigation. However, as a cryptic driver of land use and land cover change (LUCC), illegal logging causes unrecorded forest degradation that is frequently overlooked by current carbon accounting frameworks due to its hidden and dispersed nature. China, possessing the world's largest planted forest area, faces unquantified carbon risks from such activities. We constructed a national dataset using 51,777 court verdicts from 2014 to 2019. By integrating biomass expansion factors and net primary productivity models, we reconstructed both immediate carbon stock losses and disrupted future carbon sequestration trajectories. While immediate biomass carbon loss was relatively limited (~0.69 MtC), the logging disproportionately targeted fast-growing young and middle-aged forests. Consequently, the median "Carbon Debt Multiplier"—the ratio of future sequestration loss to immediate stock loss—reached 13.0. In specific hotspot cities, illegal logging offset nearly 50% of annual carbon gains from new afforestation. Furthermore, our analysis of drivers reveals that beyond natural resource availability, logistics accessibility and peri-urban transition zones are key factors driving illegal logging risk. These findings highlight how illegal extraction alters forest structural trajectories, acting as a hidden mechanism of land cover degradation that undermines sustainable land management. Ultimately, the study underscores the urgent need to incorporate environmental crime monitoring into national carbon neutrality strategies.



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1884 - Spatio Temporal Analysis Of Farmland Abandonment Based On Remote Sensing Time Series In Ibaraki Prefecture Japan

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Farmland abandonment has become an increasingly serious issue in rural Japan, yet its temporal characteristics remain insufficiently understood. Previous studies have mainly focused on the spatial distribution of abandoned farmland, while paying limited attention to when abandonment occurs. In reality, farmland abandonment does not take place simultaneously but emerges gradually across different regions, and its timing reflects regional conditions and the dynamic process of rural land-use change.

This study focuses on Ibaraki Prefecture, Japan, and identifies farmland abandonment and its timing using remote sensing data from 2015 to 2024. Based on growing-season vegetation dynamics, farmland conditions are characterized using temporal changes in vegetation indices, including annual extremes and seasonal variability. When farmland shifts from a state with stable seasonal cultivation signals to a persistently low-variability vegetation state, and this condition continues in subsequent years, it is identified as abandoned. The first year in which this transition occurs is defined as the abandonment onset year. The results are then aggregated at the municipal scale to reduce the influence of short-term fluctuations.

The results reveal clear spatial heterogeneity in the timing of farmland abandonment within Ibaraki Prefecture. From a topographic perspective, areas with higher elevation and more complex terrain tend to experience abandonment at earlier stages, whereas relatively flat and low-elevation areas show abandonment at later stages. From a locational perspective, inland areas generally exhibit earlier abandonment, while coastal areas tend to show abandonment concentrated in more recent years. Overall, farmland abandonment does not occur synchronously across the region but follows a phased and regionally differentiated temporal pattern. Compared with studies focusing solely on spatial distribution, incorporating a temporal perspective provides a clearer understanding of the abandonment process and offers a foundation for further investigation of land-use change and rural socio-economic structures.



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C24.30-Land Use and Land Cover Change => Land Use/Land Cover Changes and Land Degradation in the Anthropocene



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1575 - Human As A Geomorphic Agent The Anthropogenic Footprint Of Mining Activities In Şile İstanbul – Nw Türkiye

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Background/Hypothesis:

In the Anthropocene, humans have emerged as the most effective geomorphic agent shaping the Earth's surface. The Şile district of Istanbul represents a key area where the morphological impacts of intensive surface mining can be distinctly observed. Anthropogenic interventions have transformed the geomorphic character of the landscape beyond the scale of natural processes, promoting the development of artificial landforms. This study aims to analyse the anthropogenic footprint of mining activities on the natural topography of Şile and to quantify the associated physical and environmental changes. The central hypothesis is that surface mining disrupts the natural relief system, generates artificial geomorphic forms, and increases land surface temperatures through vegetation loss and the expansion of impervious surfaces.

Materials/Methods:

The morphological and environmental effects of mining sites were investigated using multi-temporal Digital Elevation Models (DEMs) and satellite imagery. Topographic changes were quantified by calculating the Topographic Position Index (TPI), slope, and incision depth from DEMs dated 1969-2025. Vegetation loss, anthropogenic surface density, and thermal anomalies were assessed using NDVI, NISI, and Land Surface Temperature (LST) indices derived from satellite data. All parameters were integrated within a GIS environment to determine the spatial extent and cumulative intensity of anthropogenic transformation.

Results:

DEM difference analyses reveal pronounced topographic reconfiguration driven by excavation and infilling activities within mining areas. Localised yet high-magnitude increases in slope and incision were identified, while TPI results indicate a sharp divergence from the surrounding natural relief. NDVI and NISI analyses demonstrate a strong spatial correspondence between vegetation loss and anthropogenic surface expansion. LST difference analysis further indicates the development of significant thermal anomalies in heavily disturbed zones.

Conclusions:

Land cover change induced by human activity over a period of approximately five to six decades has been clearly documented within the study area. The findings demonstrate that surface mining in the Şile basin constitutes a structural geomorphic intervention that fundamentally alters landscape geometry. The coupling of morphological degradation, vegetation loss, and thermal intensification confirms the emergence of an anthropogenically driven geomorphic system within an Anthropocene framework.



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2237 - Hidden Changes Within Land Cover Classes A Lidar Based Landscape Transformation Perspective

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Conventional land cover change analyses rely primarily on categorical classifications that describe surface types but largely ignore the vertical and volumetric properties of the landscape. Consequently, areas classified as unchanged in terms of land cover type may undergo substantial transformations that remain undetected in standard land cover change assessments. Such transformations include vertical development densification, demolition, changes in urban form, and vegetation growth, all of which can significantly influence landscape perception.

This study aims to identify and interpret perceptual landscape changes induced by three-dimensional structural transformations that occur within unchanged land cover classes. The empirical analysis focusses on the city of Łódź (central Poland), a post-industrial urban area characterised by heterogeneous urban morphology and intensive structural change. The proposed approach is based on multitemporal airborne laser scanning (LiDAR) data, from which digital terrain models, digital surface models, and normalised height models (nDSM/CHM) are derived for successive observation periods.

Analyses are conducted within fixed land cover classes in order to isolate intraclass structural change. A set of LiDAR-derived structural indicators is calculated, including changes in height distribution, volumetric density, vertical complexity, and surface roughness. These metrics enable the detection of vertical growth, infill development, demolition processes, and vegetation maturation that are not captured by conventional land cover classifications.

To link structural transformations to landscape perception, a set of perceptual indices was calculated, including the Sky View Factor, measures of spatial closure, and changes in visibility from selected vantage points. Changes in these indices were treated as proximate measures of changes in the perception of openness, spatial closure, and visual dominance.

The results demonstrate that distinct and spatially heterogeneous perceptual changes can occur despite the absence of land cover class transitions. The findings highlight the role of three-dimensional structure in landscape change analysis and confirm the value of LiDAR data for identifying transformations of perceptual significance. The proposed framework contributes to landscape studies, urban morphology research, and spatial planning by providing a method for capturing landscape dynamics that remain hidden in conventional land cover-based assessments.



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C24.33-Local and Regional Development => Border Regions and Communities: Reconceptualization in the Face of New Global Challenges and Crises



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2211 - Governance And Service Delivery In South Africa Evaluating Service Provision As An Indicator Of Good Governance

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Poverty remains a pervasive global challenge, particularly intensified in developing nations like South Africa. This research aims to scrutinize the intricate relationship between governance and service delivery in South Africa, with a special focus on the Ekurhuleni municipality. Citing substantial empirical work, this study underscores the vital role played by effective governance in mitigating poverty and enhancing the quality of life for citizens. Through a qualitative approach the research explores structural, administrative, and societal impediments to effective service delivery, such as mismanagement, corruption, and the legacy of apartheid-era spatial inequalities. South Africa, characterized by escalating unemployment rates, particularly among the youth, and other socio-economic challenges, serves as a pivotal context for this discourse. While the government services are increasingly sought as a survival mechanism, rapid population growth complicates the state's ability to deliver these essential services efficiently. The findings of the study emphasise how important it is for the city of Ekurhuleni to have flexible and dynamic governance structures that can react to changing needs in service delivery. Furthermore, there is a need for a holistic approach to governance considering the intricate interactions between many elements that have an impact on service delivery. It demands plans and policies that are responsive to the specific needs of the community, inclusive of its diversity, and flexible enough to change as the socioeconomic landscape does.



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C24.33-Local and Regional Development => Rural-Urban Relationships and Development Challenges: Local and Regional Patterns of Territorial Change



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1959 - Adapting Public Transport Infrastructure To Demographic Change A Case Study Of A Cross-strait Passenger Ferry In Northern Japan

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This study examines the reorganization of regional structures in regular shipping routes in northern Japan. In recent years, northern Japan has experienced a persistent decline in population, which has led to significant challenges in maintaining local transportation infrastructure. To investigate this matter, a regular ferry route across the Tsugaru Strait was examined as a case study of leveraging local resources to maintain operations. The research was primarily conducted through interviews with ferry operators and the collection of relevant data. The ferry connects Oma in Aomori Prefecture with Hakodate in Hokkaido, and it has historically served residents by facilitating access to essential services and commercial activities. However, both areas are experiencing rapid depopulation. In Oma, medical facilities are being reduced in size, and public transportation is being withdrawn. Hakodate is currently grappling with a number of challenges, including a decline in population, an increase in vacant housing, and the demolition of Western-style buildings that previously attracted tourists.

Consequently, ferry operators are concerned about declining local demand and are shifting management strategies to attract domestic and international tourists. Initiatives have been developed that include developing tours in which participants consume fresh tuna traded in Oma and introducing sightseeing cruises on alternative routes in Hokkaido.

This case exemplifies how transportation services adapt to demographic and structural changes within regional contexts. A comparable transformation is anticipated in numerous Japanese regions in the future, underscoring the imperative for adaptable strategies to maintain local mobility and regional connectivity.



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2573 - Dysfunctions Of Territorial Self Government In Poland Dual City–rural Municipal Systems As A Challenge For Local And Regional Development

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Territorial self-government in Poland was re-established in the early 1990s as one of the key elements of the political transformation and the process of decentralization of public authority. The introduction of municipal self-government, followed by county- and regional-level self-government, created new institutional frameworks for managing development at the local and regional levels. After more than three decades of operation, however, the dysfunctions of this system have become increasingly evident, resulting, among other factors, from the persistence of specific territorial-administrative arrangements and their mismatch with contemporary development processes.

The aim of this paper is to analyse selected dysfunctions of territorial self-government in Poland, with particular emphasis on dual city–rural municipal systems composed of urban and rural municipalities sharing the same name and functioning as separate local government units. The paper has a theoretical and exploratory character and is based on an analysis of the relevant academic literature.

The first part of the paper presents the theoretical framework concerning territorial self-government in Poland. This is followed by a discussion of the definition and specific features of dual municipal systems, their genesis and evolution, as well as their spatial typology. The subsequent section focuses on the analysis of relations between cities and the surrounding rural municipalities, highlighting the consequences of such institutional systems for local development governance.

The final and key part of the paper reviews selected positions and ongoing debates concerning the future of dual city–rural municipal systems. These range from maintaining the current status quo, through strengthening inter-municipal cooperation, to postulates advocating the consolidation of municipalities into unified urban–rural local government units.

The conclusions indicate that dual territorial self-government systems constitute a significant challenge for local and regional development. At the same time, the Polish case makes an important contribution to the international debate on the mismatch between administrative and functional boundaries, as well as on the dilemma between inter-municipal cooperation and territorial consolidation.



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C24.33-Local and Regional Development => Eco-Tourism and Land Use Dynamics: Sustainable Landscapes in Transition



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1180 - Tourism Resilience Evaluation Of Traditional Villages A Case Study On Huayuange Village Of Hunan Province In China

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Tourism resilience in traditional villages represents a critical dimension of regional resilience, and the development of robust evaluation models has become a key academic concern. Drawing on an in-depth conceptual analysis of tourism resilience, this study constructs an evaluation framework encompassing six dimensions-economic, cultural, ecological, social, institutional, and experiential. Using Huayuange Village of Hunan Province in China as a case study, the research integrates the Analytic Hierarchy Process (AHP), multi-level fuzzy comprehensive evaluation, and Importance Performance Analysis (IPA) to comprehensively assess the level and characteristics of tourism resilience, and to propose stage-based strategies for its enhancement. The findings indicate that: (1) tourism resilience in traditional villages, structured around the “economic-social-cultural-ecological-institutional-experiential” subsystems, exhibits flexibility, responsiveness, and adaptability, enabling the system to swiftly respond to external disturbances and achieve recovery and innovation through internal adjustments; (2) the overall tourism resilience of Huayuange Village is at a moderate level, with subsystem resilience ranking as ecological > social > economic > institutional > experiential > cultural. Indicators within the advantage zone constitute the foundation of system stability, whereas those within the opportunity zone serve as key levers for resilience enhancement; (3) the improvement of tourism resilience should proceed in a phased manner across the six subsystems, by addressing weaknesses, consolidating strengths, and strengthening risk resistance to foster the village’s sustainable development.



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C24.34-Marginalization, Globalization, and Regional and Local Response => Globalisation, Localisation and the Reconfiguration of Marginalised Spaces



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2123 - Stay Or Leave – Stayers As Local Actors In Rural Areas In Serbia

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Background: Many rural areas are commonly conceptualized as left-behind places, characterized by persistent marginalization, long-term neglect, and structural disadvantages. Such framing has contributed to the stigmatization of rural areas, accompanied by depopulation, population ageing, out-migration, and overall devastation. People who are living in rural areas are usually seen as people without personal capacities to build a better life. However, nowadays, in accordance to the theory of immobility, staying is defined as a personal decision and “stayers” as people with a choice to make a quality life at their own pace in rural environment.

Materials and Methods: The study was conducted in seven municipalities in Serbia, located in the Šumadija and Western Serbia Region. Data were collected in 2024 through a standardized semi-structured questionnaire in electronic and paper formats. The total sample comprised 954 respondents aged 18 to 94. The analysis employed descriptive statistics and non-parametric statistical tests to examine differences between population groups with regard to mobility intentions.

Results: The findings indicate that the majority of respondents express neutral or negative attitudes towards leaving their place of residence. Nearly 70% assessed the quality of life in rural areas as neither good nor bad, or predominantly good. Respondents intending to stay are generally older, with a slight predominance of men (55.7%). Younger respondents, particularly young women, show a stronger inclination towards leaving. Positive aspects of rural life most frequently identified include food quality, environmental conditions, and the aesthetic value of the natural landscape. Key reasons for staying are strong family ties, secured housing conditions, and a slower and more peaceful pace of life. Most stayers are married (76.1%), and 80% live in inherited family houses. Conversely, limited social life, a lack of cultural activities, and restricted business and entrepreneurial opportunities were identified as the most critical constraints influencing mobility decisions, especially among younger populations.

Conclusion: The survey results suggest a latent potential for revitalization and sustainable quality of life in selected rural municipalities. These areas are characterized by valuable natural resources and a long tradition of agricultural activity, which constitute an important contextual background shaping local (im)mobility intentions.



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C24.34-Marginalization, Globalization, and Regional and Local Response=> Left Behind Places and Marginality in a Changing World



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1753 - Beyond The Stars Unraveling The Innovation Mechanism Of Middle And Low Income Countries

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With the knowledge sourcing and outsourcing, cities with different innovation capabilities participate in global innovation networks (Aliasghar & Rose, 2025; Ernst, 2009). Innovation activities are highly uneven in space (Aghion et al., 2019). Fewer global Innovation centers occupy the leading position in the Global Innovation Networks, while more cities are at the margin (Friedmann, 1986; Kitajima & Okamura, 2025). Generally, innovation capabilities are highly bonded with economic development (Yu & Liu, 2025). Most researches discuss the cases of successful countries and the mechanism behind. However, few lights are shed on lagging behind countries or regions, especially at multi-level (Abbasiharofteh & Maghssudipour, 2024; Giuliani et al., 2019). Follow the income level division of World Bank, we explore the technology innovation patterns and mechanism of middle- and low-income countries based on PCT data. Based on the Triple-Helix theory and National (Regional) Innovation System framework, we design the multi-level framework from organizations to cluster, cities and countries (Basso et al., 2021; Trippl et al., 2024). The results show that countries at different income levels are posited heterogeneously in technology life curve. Compared with high-income countries (mature stage), upper middle-income countries still at rapid growth stage. Countries at lower middle-income and low-income level still at the very beginning of the growth. However, the later groups also have star countries such as India and North Korea. Firms as gatekeepers play an important role on introducing the external knowledge to the local market. Cities as the policy venues interact in the national geopolitical context. Regression results knowledge base and cooperation both have positive significant influence on technology output, but the impact of knowledge base exceeds the external collaboration, indicating the importance of independent innovation for middle- and low-income countries.



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C24.37-Mountain Studies => International Symposium of Mountain Studies



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1912 - Beavers In The Carpathian Landscape Public Attitudes Toward Natural Engineers And Their Impact On Water Quality

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The recovery of Eurasian beavers (*Castor fiber*) in the Western Carpathians represents one of the most profound recent transformations of mountain river systems. After regional extinction by the late nineteenth century, beavers were reintroduced in the 1980s in southern Poland and subsequently expanded naturally, including into Slovakia. Their rapid spread has resulted in the establishment of numerous colonies across diverse environmental and socio-economic settings.

This study combines social and hydrochemical approaches to assess the consequences of beaver recolonization in the Polish and Slovak Carpathians. The first objective was to explore attitudes of local communities who simultaneously benefit from and are inconvenienced by beaver activity. The second objective was to quantify how beaver dams affect the physicochemical properties of mountain streams, accounting for seasonal dynamics and variation among pond types and ages.

Field investigations were conducted along a north–south transect across the Western Carpathians, encompassing sites that differ in elevation, land use, urbanization, and duration of beaver presence. Social data were collected through structured interviews. Water samples were collected upstream of beaver ponds, within the ponds, and downstream of the dams. In addition, longitudinal sampling was conducted along selected streams

The results indicate that insufficient preparedness for the spread of wildlife exacerbates the gap between environmental conservation objectives and the concerns of local communities. Broad-based education on ecosystem services, together with improved support for people affected by beaver-related conflicts, is therefore needed. Physicochemical analyses further revealed that both seasonal variability and differences in pond type and age significantly influence the ionic composition of stream water downstream of beaver dams. The observed patterns are likely driven by biogeochemical processes associated with organic matter accumulation in beaver ponds, including its decomposition and aerobic/anaerobic oxidation, as well as calcium carbonate precipitation.

Linking community attitudes with observed water-quality changes reveals that successful beaver-based river restoration requires not only ecological effectiveness but also socially informed management strategies in the Carpathians.

This research was funded in whole by the National Science Centre, Poland (grant number: 2020/39/O/ST10/01354).



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C24.37-Mountain Studies => Mountain Futures: Cryosphere Dynamics, Hydrology, Hazard and Resilience in a Changing Climate



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3239 - Spatio Temporal Evolution Of Supra Glacial Ponds And Supra Glacial Streams Over Gangotri Glacier Central Himalayas

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Supraglacial ponds and meltwater streams are fundamental components of the evolving surface hydrology of debris-covered glaciers, exerting a strong control on glacier mass loss and geomorphic transformation. This study presents a comprehensive assessment of the spatio-temporal evolution of supraglacial ponds and supraglacial meltwater streams over the Gangotri Glacier, Central Himalayas, using high-resolution satellite observations.

The analysis reveals that supraglacial ponds are widespread across the low-gradient ablation zone of the glacier and exhibit dynamic behaviour through expansion, coalescence, and are persistence over time. These ponds are frequently associated with ice cliffs and act as localized hotspots of enhanced ablation. In parallel, an evolving network of supraglacial meltwater from tributary glacial-streams has been identified which is actively reworking the surface of Gangotri glacier. These streams, especially the one from Raktavarn glacier incise into debris-covered ice, driving both thermal and mechanical erosion, and significantly altering surface morphology.

Spatial analysis of supra-glacial hydrology of Gangotri glacier indicates that these features are predominantly concentrated within the mid- to lower-ablation zones and shifting over time as glacier moves downstream. Temporally, the glacier surface exhibits progressive hydrological reorganization, reflecting both climatic forcing and internal ice dynamics. The supra-glacial ponds are increasing both in numbers and size and causing enhanced localized melting of the glacial ice. Understanding the spatio-temporal evolution of these features is critical, as they directly influence glacier response to climate change, regulate meltwater production, and contribute to downstream hydrological variability and hazard potential, including glacial lake outburst floods. This study underscores the importance of high-resolution monitoring for capturing these rapidly evolving processes and provides essential insights for future glacier modelling, hazard assessment, and water resource management in the Himalayan region.



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C24.38-Political Geography => Reframing Multipolarity Between Systemic and Spatial Geopolitics



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1495 - Globalisation Localisation And Regional Governance In The Eurasian Space

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BACKGROUND / HYPOTHESIS

Recent debates on globalization and localization have increasingly highlighted the importance of regional governance beyond traditional state-centric frameworks. In the Eurasian space, expanding cross-regional interactions raise questions about how governance, connectivity, and institutional coordination are negotiated across diverse political and cultural contexts. This paper hypothesizes that regional governance in Eurasia is shaped not through linear integration processes, but through ongoing negotiation between global pressures and localized institutional practices.

MATERIALS AND METHODS

The study draws on qualitative empirical materials, including policy documents, institutional practices, and analytical observations from Central Asia. Kazakhstan is used as an illustrative reference point. A comparative and interpretive analytical approach is employed to examine how governance arrangements emerge through multi-layered institutional and policy processes across the region.

RESULTS

The analysis indicates that regional governance in the Eurasian space is characterized by flexible and adaptive coordination mechanisms rather than fixed or uniform integration models. Governance practices are produced through interactions among multiple actors and levels, reflecting a dynamic balance between global integration pressures and locally embedded institutional responses.

CONCLUSIONS

The findings suggest that Eurasian regional governance should be understood as an ongoing and negotiated process, positioning regional spaces as active sites shaping global-local interactions. By situating Central Asian experiences within a broader comparative perspective, the paper contributes to discussions on regionalism, governance, and connectivity, and speaks directly to the conference theme “Exploring the Earth, Connecting Worlds.”



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C24.39-Population Geography => Global Disasters and Public Health: Strengthening Systems for Climate Resilience



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1227 - Construction Of The Web Mapping Systems Of Small Area Population Projections As An Open Database Focusing On Their Application To Flood Disaster Prevention

Takashi Inoue¹

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Population projections based on small areas, that is, areas smaller than municipalities, can provide significantly more precise and valuable information than municipality-level projections when formulating and implementing various regional policies. However, until the early 2010s, examples of implementing such small-area population projections on a national scale were virtually nonexistent, including in Japan. In contrast, the author first executed small-area population projections covering the whole of Japan and published the results as a web mapping system in 2016. Subsequently, similar systems were constructed for the State of Washington, Taiwan, the United States, South Korea, and Australia. The author refers to this global series of systems as the SAPP series, an acronym for Small Area Population Projections. The SAPP series can be considered a type of open database. In 2025, a hub site (URL: <https://sapp-agu-econ.hub.arcgis.com/>) was created to unify this series. By clicking the links to each country or region displayed on this site, anyone can easily access the corresponding web mapping system of this series. The application scope of the small-area population projection data to regional policy is extremely broad and primarily extends across the following five fields: 1) regional disaster prevention planning, 2) regional planning for public health, medical care, and welfare, 3) public facility placement planning, 4) infrastructure development planning, and 5) area marketing.

This presentation introduces the SAPP series and, focusing on the regional planning for flood disaster prevention, discusses the application results of the small-area population projection data loaded into the series. The author specifically targeted Japan and derived the application results using the following methods: first, obtained nationwide spatial data on flood inundation zones, i.e., the maximum extent of flooding anticipated due to future climate change; next, using GIS, overlapped these zones with small areas assigned the SAPP series data; and finally, examined differences in future population structure between small areas within the flood inundation zones and those outside them. The results showed that the proportion of the elderly population in flood inundation zones would remain lower than in non-inundation zones until around 2045, but would subsequently exceed it.



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**C24.41-Silk Road Civilizations and Environments
Commission => Climate Change and Transcontinental
Exchange: Drivers of Civilizational Dynamics Across
the Silk Road**



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1345 - Geoarchaeological Investigation At Sanyangzhuang

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Although a wide variety of new understandings concerning agricultural origins have been gained in the past few decades, there is a huge intellectual gap between the extensive agriculture soon after the earliest domestication and intensive agriculture practiced by early states. Why did early farmers continuously invest various resources to intensify food production? How did environmental factors function behind the progress of agricultural intensification? Questions concerning the relationship between agricultural intensification and environment have been attracting but also puzzling researchers for a long time.

Deeper understanding of these questions may be gained through research at Sanyangzhuang in the Central Plain, China. Sanyangzhuang is a rural settlement in present Henan Province in central China. Many agriculture features, such as ridge-and-furrow fields, have been recovered in three strata (dated to the late Neolithic, the late Bronze Age, and the early Iron Age respectively). Additionally, a complete history of the Yellow River floods has been recorded in the stratum around Sanyangzhuang site. All these features enable our further exploration of interactions between agricultural intensification and environmental evolution. By use of data from Sanyangzhuang site, this paper will mainly focus on two dynamic environmental factors in this region: the East Asia Monsoon determined paleoclimate and the alluvial process of the Yellow River (notably, alternate periods of stability and inundation from flooding). By integrating these two lines of evidence, the local paleoenvironment will be reconstructed and environment-induced risk management will be investigated as one of the potential driving forces of agricultural intensification.



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1630 - Middle Holocene Arid Climate In Southwest China Inferred From Elemental Geochemical Proxies Of Stalagmites

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Based on the Mg/Ca ratios and $\delta^{18}\text{O}/^{16}\text{O}$ values of stalagmites collected from Shenqi Cave, this study reconstructed the hydroclimate variations in Southwest China over the past 9,000 years. The shifts in stalagmite Mg/Ca ratios and $\delta^{18}\text{O}/^{16}\text{O}$ values consistently indicate a three-stage pattern of Holocene hydroclimatic evolution in this region: a humid phase from the early Holocene to the early-middle Holocene, an arid interval during the late-middle Holocene (6450–3800 a BP), followed by a return to humid conditions in the late Holocene. The amplitude of centennial to decadal-scale hydrological events was significantly larger during two transition intervals (4350–4000 a BP and 7630–6480 a BP) compared to other periods. Both intervals correspond to the transitions of effective precipitation from one regime to another, implying that the centennial to decadal-scale variability tends to become more unstable during the transitional phases of millennial-scale climate system shifts. This finding highlights the modulating effect of millennial-scale climatic changes on centennial to decadal-scale variability. Following the termination of the middle Holocene arid period, the relatively stable hydrological conditions in Southwest China since 4000 a BP may have provided favorable climatic prerequisites for the prosperity and development of the Sanxingdui Culture (~4000–3200 a BP). Further comparisons reveal that the middle Holocene arid climate was a widespread climatic phenomenon across southern China. In contrast, evidence including high lake levels, paleosols and wetlands extensively developed in the monsoonal region of northern China indicates a humid middle Holocene climate in that area. These observations collectively suggest a seesaw precipitation pattern between the northern and southern monsoonal regions of China during the middle Holocene, a pattern that is corroborated by numerical simulation results.



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1671 - Sustainable Urbanization In The Countries Along The Silk Road Challenges And Pathways

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Urbanization in the countries along the Silk Road is unfolding at an unprecedented pace, reshaping economic landscapes while exposing deep social and environmental vulnerabilities. This transformation embodies both promise and precarity. Cities drive national growth yet remain trapped in structural economic fragility, governance deficits, and escalating ecological stress. This study interrogates the dynamics and policy pathways of sustainable urbanization in the countries along the Silk Road through an integrated framework of economic resilience, social inclusion, and environmental sustainability. The findings reveal that the prevailing model of urban expansion—rapid but uneven—has reinforced spatial inequality and environmental degradation, rendering current trajectories unsustainable. Achieving a sustainable urban transition demands not incremental adjustments but systemic reform in urban governance and planning priorities. Economically, empowering municipal institutions with fiscal autonomy can bolster resilience if embedded in transparent and equitable governance. Socially, inclusive reforms that extend housing, services, and employment to marginalized populations, formalize informal settlements, and embed gender-responsive urban design are essential for cohesive urban societies. Environmentally, integrating climate-responsive and nature-based strategies into urban development is imperative to safeguard cities against recurrent floods and heatwaves. This study advances a phased policy roadmap, strengthening municipal capacity in the short term, expanding green infrastructure and smart systems in the medium term, and institutionalizing climate-smart, circular governance in the long term. By situating the countries along the Silk Road urban transformation, the research offers critical insights into building resilient, inclusive, and ecologically balanced urban futures.



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2016 - Human Settlement And Destructive Activities Disrupt The Positive Contribution Of Dust To Plant Biomass Growth Over The Past 2000 Years

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The dual pressures of ongoing global warming and intensified anthropogenic activities pose increasing threats to terrestrial vegetation ecosystems, particularly in arid and semi-arid regions that are highly sensitive to environmental perturbations. Understanding the long-term interactions among climate change, atmospheric processes, and human activities is therefore essential for evaluating past and future ecosystem dynamics. In this study, we reconstructed variations in terrestrial vegetation composition and plant biomass over the past ~4500 years using n-alkane molecular proxies derived from sediment cores collected from two alpine lakes in northwestern China. These lakes are located in a climatically sensitive region influenced by both westerly circulation and regional human activities. Our results reveal pronounced temporal and spatial variability in plant biomass during the late Holocene. Notably, changes in plant biomass do not show a consistent relationship with reconstructed temperature or precipitation variations, suggesting that climatic factors alone cannot explain the observed vegetation dynamics. Instead, we propose that enhanced atmospheric CO₂ concentrations and increased nutrient inputs associated with aeolian dust deposition played a significant role in promoting plant biomass growth over centennial to millennial timescales. However, these positive effects were not continuous. By comparing the reconstructed vegetation history with archaeological and historical records from the Tianshan Mountains, the eastern Silk Road region, and the Hunsandak Sandy Land, we identify several periods during which intensified human activities coincided with abrupt declines in terrestrial vegetation. Increased demand for plant resources related to human settlement expansion, military infrastructure development, and warfare likely led to rapid vegetation degradation, offsetting or even overwhelming the fertilization effects of dust-derived nutrients. These findings highlight the complex interplay among climate, atmospheric processes, and human land use in shaping long-term terrestrial ecosystem dynamics in arid Central Asia.



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2084 - Uav Lidar Deciphers Qin Han Frontier Networks And Early Silk Road Branch

Zijie Zou ¹, *Shanjia Zhang* ²

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The development and evolution of trans-regional communication networks have attracted interdisciplinary attention from archaeology, history, and geography. As a crucial corridor connecting Eastern and Western civilizations, the formation mechanism of the transportation network during the incipient phase of the Silk Road (the Qin and Han dynasties) remains a research hotspot. The governance of the northwest frontier by the Qin and Han empires not only reshaped the regional geopolitical landscape but also laid the foundation for the communication network at the eastern end of Eurasia. The Longdong region, a “crossroads” linking the Guanzhong Plain to the Hexi Corridor and steppe areas, serves as a key entry point for analyzing the early form of the Silk Road through the evolution of its urban sites and changes in transportation networks during the Qin and Han dynasties. Through UAV-lidar surveys and field investigations, this study reveals the inheritable relationship between the Qin Dynasty’s frontier defense system and the Western Han Dynasty’s development of the Silk Road. Frontier construction in the Qin Dynasty laid a critical foundation for the prosperity of the Silk Road in the Western Han Dynasty, and the spatiotemporal evolution of urban site clusters provides direct evidence for the transformation of frontier governance strategies by the Central Plains dynasties. This research offers a significant case study for understanding the formation of trans-regional communication networks across Eurasia.



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2355 - The Prehistoric Dispersal Of Millets Across Eurasia

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Domesticated in northern China, foxtail millet (*Setaria italica*) and broomcorn millet (*Panicum miliaceum*) formed the foundation of the East Asian Neolithic agricultural system. By synthesizing available archaeobotanical, isotopic, and radiocarbon dating data, this study reconstructs the prehistoric dispersal networks of these crops across Eurasia. Our findings show that millet was first domesticated in northern China ca. 10,000 years before present, becoming widespread in northern China between 8000 and 7000 a BP. Millet agriculture was more widespread between 7000 and 6000 a BP and became a dominant dietary component. Then, the period from the 3rd to the 2nd millennium BC was pivotal for millet diffusion in Eurasia. During this phase, millets expanded westward via the Inner Asian Mountain Corridor and the Steppe route to Europe, while simultaneously spreading southward into Southeast and South Asia. Owing to their remarkable environmental resilience, millets occupied a critical niche within arid zones and pastoralist economies. This dispersal process involved not merely the geographic movement of crops, but also human migrations and exchanges of technology. Ultimately, it profoundly reshaped prehistoric subsistence economies and social evolutionary trajectories across Eurasia, marking a significant chapter in the history of prehistoric agricultural globalization. Tracing the dispersal trajectories of these crops, therefore, provides a crucial lens for understanding the complex mechanisms of prehistoric trans-Eurasian cultural exchange.



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2444 - Ancient Dna From Site Sediments Reveals Changes In Subsistence Patterns And Agricultural Development Of Neolithic Populations In The Northeastern Qinghai Tibet Plateau

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The northeastern Qinghai-Tibet Plateau, as a crucial transitional zone connecting the Central Plains civilization with the hinterland of the Qinghai-Tibet Plateau and an important link for cross-continental cultural exchanges between the East and the West, the research on the prehistoric human-environment relationship in this region is a frontier in the interdisciplinary research of environmental archaeology and molecular biology. In recent years, ancient environmental DNA has developed rapidly and has great potential in revealing ecological backgrounds, agricultural and pastoral development, etc. It is an effective method to understand the issues of past human activities and environmental changes. However, the false positive problem in metagenomic species identification seriously affects the reliability of the results. This study used subsets of original sequencing data of ancient environmental DNA from different sedimentary environments and different sedimentary ages as test samples, conducted benchmark tests from aspects such as blank control comparison, quality control, and reference genome database, explored the optimal strategy for false positive control, and applied it to the species identification of ancient DNA metagenomic sequencing data from the accumulated sediments of 61 Neolithic sites in the northeastern Qinghai-Tibet Plateau. The results show that the species identification results are basically consistent with the current archaeological understanding. There is a pattern of transformation in the subsistence mode from agriculture-dominated (with pig breeding in some cases) in the Majiayao-Qijia-Xindian/Kayo cultural sequence to semi-agricultural and semi-pastoral. The utilization of animal resources gradually changed from pig breeding in some cases to animal husbandry dominated by cattle, sheep and horses, and the utilization of plant resources transitioned from being dominated by millet and broomcorn millet to being dominated by barley and wheat. The above reflects the effectiveness of our false positive control strategy for metagenomic species identification. At the same time, we are using this new method to explore the co-evolution mechanism of the “crop-livestock-human” ecosystem during the Neolithic period in the northeastern Qinghai-Tibet Plateau, providing a typical case for understanding the human-environment relationship in high-altitude areas around the world.



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C24.44-Transport Geography => Geographies of High-Speed Rail



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2346 - High Speed Rail Resilience For Wide Area Mobility During Major Natural Disasters

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As climate change progresses, the frequency and scale of large scale and wide area natural disasters are increasing worldwide. Such events disrupt transport systems in multiple ways. In particular, the suspension of high-speed rail services can severely hinder long distance travel for large numbers of people, thereby exacerbating wider socioeconomic disruption.

This study focuses on Japan, a country exposed to diverse natural hazards including earthquakes, typhoons, floods, and tsunamis, to examine the role of high-speed rail during major disasters. Historical evidence underscores the scale of disruption: following the 1995 Great Hanshin Awaji Earthquake, operations on the Sanyo Shinkansen were suspended for 80 days, while the 2011 Great East Japan Earthquake led to a 48 day suspension of services on the Tohoku Shinkansen. The Shinkansen network has expanded nationwide, and by 2037 the Chuo Shinkansen maglev line is planned to connect the three major metropolitan areas of Tokyo, Nagoya, and Osaka, linking approximately 500 km in 67 minutes.

Using GIS and spatial data, this study assesses the disaster resilience of high-speed rail under scenarios of the future high-speed rail network. Drawing on regional datasets such as population and passenger volumes, the analysis evaluates the redundancy of high-speed rail systems in supporting wide area mobility during large scale disasters. In addition, smartphone based human mobility data observed during actual disaster events are used to examine the feasibility of identifying behavioural patterns among affected individuals who rely on high-speed rail. The findings suggest the need to develop and strengthen high-speed rail networks with future large scale disasters in mind, and highlight the importance of alternative transport strategies that take passengers' mobility patterns into account.



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C24.44-Transport Geography => Harnessing Multi-Source Spatial Big Data & GeoAI: Advancing Mobility, Health, and Sustainability in Urban Futures



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1715 - Mobile Eyes On The Street Can Platform Couriers Help Deter Burglaries

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Couriers are essential component of the platform economy, they frequent neighborhoods along their delivery routes and interact with local residents. They are essentially mobile eyes on the street, analogous of Jane Jacobs' eyes on the street. Could such mobile eyes on the street help deter burglaries? Yet, there is a lack of empirical research on the relationship between courier's activities and burglaries. To address this gap, this study utilized mobile phone big data to map courier's activities and leveraged spatial lagged negative binomial regression to examine their association with burglaries in ZG city, China. The model controlled for other factors, including proportion of retirees, proportion of elevator-equipped buildings, housing rent, transport accessibility, crime generators, and community heterogeneity. Key findings reveal: (1) platform couriers concentrate in commercial/mixed-use zones, high-density residential areas and logistics hubs, exhibiting a spatial pattern that is different but related to the pattern for burglaries; (2) a statistically significant negative association exists between platform courier's activities and burglaries, confirming their role as informal guardians who can deter crime. This is a novel discovery that has not been confirmed in the literature of crime geography; (3) the deterring effect of platform couriers is secondary to that of retiree elderly presence, indicating that the guardianship of residents remains a superior factor in ensuring community safety. This research extends Jane Jacobs' eyes on the street theory into platform economy contexts and offers valuable insights for integrating platform couriers into smart-city crime prevention strategies.



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1730 - Multisource Mobility And Activity Data For Subnational Outbreak Early Warning Using Long Short Term Memory And Graph Attention Networks

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In fast-urbanising regions, infection risk follows mobility networks, yet routine surveillance cannot monitor every province or district. Nighttime lights proxy human activity and urban functional intensity, aggregated mobility and stay-put rates capture short-term mixing, and social connectedness reflects persistent ties that drive importation and spillovers. We hypothesise that combining these signals with inter-regional connectivity can produce an operational two-week-ahead ranking to target limited testing and response.

We built a weekly first-level administrative unit panel for 15 African countries over 53 pandemic weeks, integrating corrected nighttime lights, privacy-preserving aggregated mobility change and stay-put indicators, and social connectedness features. With incomplete subnational case truth, high-risk events are defined as units in the within-country top decile of baseline-normalised nighttime-light surges two weeks ahead. We train a spatiotemporal graph attention network with a long short-term memory temporal encoder and within-country connectivity graphs to capture mobility-driven spillovers, and evaluate alert-budgeted country-week Top-K ranking using Hit@K, Cover@K, and Precision@K against random and non-graph baselines.

With K=3 alerts per country-week, the model achieves Hit@3 of 0.877, Cover@3 of 0.654, and Precision@3 of 0.649, substantially outperforming random ranking with Hit@3 of 0.573 and Cover@3 of 0.502. Graph attention improves discrimination, reaching a validation area under the curve of 0.692, while maintaining strong Top-K utility, indicating complementary value from connectivity-driven spillovers. Stratified analyses show higher precision in high-activity regions, consistent with stronger signals in urban units.

The proposed decision-support pipeline harnesses multisource spatial big data to prioritise subnational outbreak risk under constrained surveillance capacity, capturing roughly two-thirds of high-risk events while monitoring only a small fraction of regions per week. By explicitly modelling mobility- and connectivity-driven spillovers, it aligns with transport geography and urban sustainability by enabling targeted, resource-efficient monitoring along corridors and metropolitan hubs, with transferability to future respiratory epidemics.



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C24.44-Transport Geography => Modelling Mobility Behaviours: Diverse Methods, Shared Challenges, New Insights



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1134 - Modelling Mobility Shifts Induced By Low Emission Zones Behavioral Responses Spatial Patterns And Policy Effectiveness

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Title – MODELLING MOBILITY SHIFTS INDUCED BY LOW EMISSION ZONES: BEHAVIORAL RESPONSES, SPATIAL PATTERNS AND POLICY EFFECTIVENESS

Background – Low emission zones (LEZs) have become an increasingly popular policy instrument aimed at reducing urban air pollution and promoting sustainable mobility patterns. Beyond environmental outcomes, LEZs are generally expected to induce mobility shifts through behavioral adaptation and spatial reorganization of traffic. Existing studies point to changes in modal split, route choice and travel demand, yet these effects vary considerably across cities and implementation contexts. This study addresses the question of whether and to what extent LEZs influence mobility behavior, and how these effects are identified in the existing literature.

Materials and methods – The study is based on a review of scientific literature addressing LEZs, urban mobility behavior, and spatial impacts of transport policies. Peer-reviewed articles and policy reports were analyzed with regard to the indicators used to assess mobility-related outcomes. A qualitative comparative approach was adopted to identify recurring patterns, limitations and research challenges in modelling mobility behavior in LEZ contexts.

Results – The reviewed studies suggest that LEZs are associated with a decline in high-emission vehicle traffic within restricted areas and a partial shift toward alternative transport modes. This includes reductions in private car use, shifts towards public transport and active modes, traffic redistribution. However, reported effects are highly variable and context dependent.

Conclusions – New forms of transport, technologies enabling traffic management necessitate continuous research in this field so that cities can effectively shape transport policies. The findings highlight need for more comprehensive approaches to assessing mobility behavior in LEZs. Future research should better integrate behavioral aspects into transport systems and combine quantitative indicators with spatial and contextual analysis.

Acknowledgements – This research was funded by the National Science Centre in Poland within the framework of project no. 2024/53/B/HS4/00389



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C24.44-Transport Geography => Resilience and Adaptability of Transport and Mobility Systems in the Face of External Shocks



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1034 - Warsaw Mobility Under Climate Oriented Regulation Early Adaptation And Pathways To Limit Excess Travel

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Climate-oriented regulation in dense capitals, here, a low-emission zone in Warsaw, constitutes a policy shock that tests system resilience. We hypothesised that short-run adaptation would preserve the temporal backbone of mobility while accelerating fleet cleaning inside the zone, and that the most promising routes to reduce unnecessary travel would be revealed in when, where, and why trips cluster rather than in wholesale modal shifts.

We analysed three months, March 2024 (pre-implementation), October 2024 (early post-implementation), and March 2025 (post-implementation), combining stop-level bus and tram boardings, metro entries and exits, roadside car volumes, and municipal sensors for particulate matter and nitrogen dioxide. A fixed zone polygon was applied to all periods. Temporal patterns were summarised in weekday-by-hour matrices; contrasts used chi-square tests with Cramér's V and Jensen–Shannon divergence. Pollutant differences used Welch t-tests, Mann–Whitney tests, and Hedges' g under observation-level and station-average specifications. Car counts were converted to persons using an occupancy factor of 1.3.

Across periods, peak times were stable (morning and afternoon on weekdays; early afternoon on weekends) with small effect sizes. Early changes were amplitude adjustments around commuting windows rather than shifts in timing or direction. The technology mix inside the zone showed a persistent cleanliness advantage. Environmental signals were mixed and precision limited by sparse in-zone sensors. The concentration of marginal changes around short inner-city chains and school-work peaks highlights windows where demand-side levers could meaningfully trim travel without suppressing accessibility.

Warsaw's system absorbed the policy shock through fine-grained retiming and cleaner vehicles, indicating resilience. To translate this stability into lower travel demand, scalable to other large Polish cities, priority measures include parking and curb management, public-transport priority, integrated ticketing, support for teleworking and trip chaining, and targeted freight consolidation within and near the zone.



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**C24.45-Urban Commission: (Re-)Thinking Cities
and the Urban: From the Global to the Local =>
Cities and Urban Systems: Drivers of, or Driven by
Transformational Change?**



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1468 - No More Murder On The Orient Express Transformation Of The Railway Zone In The City Of Zagreb

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In 1862, the first railway line reached Zagreb, triggering economic and industrial development along its route. The first railway station, now known as West Station (Zapadni kolodvor), became the centre of the city's initial manufacturing zone. This growth was followed by the opening of the second station, now the Main Station (Glavni kolodvor), in 1892, and the opening of the railway company (Hungarian MAV, later TŽV Gredelj) in 1884. At that time, this zone became the largest industrial and railway area in the city, transforming the entire neighbourhood. Simultaneously, the area north of the Main Station began to develop into the contemporary city centre, with representative buildings designed by renowned architects of the era, including the famous Esplanade Hotel, making Zagreb one of the most important stops on the Orient Express route.

The relocation of TŽV Gredelj took place from 1967 until 2010, when all production moved to the industrial zone Vukomerec in the south-east part of Zagreb, leaving a large degraded and underserved urban area. In 2024 and 2025, site remediation began with the demolition of old halls and the preservation of culturally protected sites. Meanwhile, after the 1990s, railway lines in Croatia deteriorated and many lines were closed, including the famous Orient Express line, which no longer stops in Zagreb.

This paper analyses the evolution of the urban fabric along the railway line in Zagreb, with special attention to the area of TŽV Gredelj and the zone south of the Main Railway Station. It presents and evaluates future scenarios for the redevelopment of the largest brownfield site in Zagreb. Different scenarios will be presented and assessed, ranging from official revitalisation projects to alternatives developed and discussed by various interest groups and academia.



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1845 - Reconceptualizing Urban Development In The Third Dimension An International Comparative Study Of Vertical Oriented Development (vod)

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The transition from two-dimensional to three-dimensional urban mobility, driven by eVTOLs and low-altitude technologies, necessitates a parallel evolution in urban development paradigms. This study proposes and validates a novel “Space-Institution-Industry” tripartite framework to systematically analyze the emerging mode of Vertical-Oriented Development (VOD), which extends the principles of Transit-Oriented Development (TOD) into the aerial dimension.

Through a comparative analysis of four emblematic pathways—Osaka’s “rail-integrated” retrofit, Paris’s “corridor-coupled” preservation-sensitive model, Dubai’s “hub-platformized” policy-driven expansion, and Coventry’s “transferable pilot” for agile validation—the research demonstrates how the interplay between spatial form, institutional innovation, and industrial synergy shapes divergent VOD trajectories. The framework proves robust in deciphering the logic behind these variegated implementations.

The study further stresses the framework by applying it to the dynamic context of Chinese megacities (e.g., Shenzhen, Guangzhou). Here, the model reveals not only the framework’s explanatory power but also accentuates amplified institutional challenges—such as integrated air-ground planning and multi-agency coordination—that are critical for scalable VOD integration. The Chinese context, therefore, is presented not as a unique case but as a high-intensity testbed that highlights universal bottlenecks in governance and planning when transitioning to 3D urban mobility systems.

This research contributes to planning theory by offering a unified framework for VOD analysis and providing comparative insights for policymakers worldwide. It concludes that the viability of VOD hinges not merely on technological readiness but on the strategic alignment of spatial networks, adaptive governance, and viable business ecosystems, with institutional design being the most context-sensitive and pivotal dimension.



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2271 - Urbanization Fronts And Energy The Example Of The Guiana Shield

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How do urban networks form in energy and mining regions? Are these networks characterized by a polycentric structure or by metropolization? How can we analyze the characteristics of urban growth in current “urbanization front” zones? Is it still relevant to analyze the current urban dynamics of energy frontiers, distinguishing between those in developing countries and those in formerly industrialized regions? These questions are central to our discussion in this paper.

The main issue therefore concerns the continuities and changes in the processes and dynamics of pioneering cities. Indeed, this paper proposes a diachronic approach over the last twenty years, focusing on the urban axis in relation to socio-economic and environmental aspects.

Based on a regional approach to the Guiana Shield (Venezuelan Guiana, Guyana, Suriname, French Guiana), the study of the factors driving “urbanization fronts” highlights the complex spatial articulation with pioneering energy fronts (mining and/or hydrocarbon-rich). Small and medium-sized towns play a key role in territorial transformation processes (such as the Arco Minero in Venezuelan Guiana).

The research methodology adopted is based on a geospatial and diachronic approach, drawing on a review of existing literature, field observations, and semi-structured interviews with various types of stakeholders (institutions, businesses, civil society).

Thus, the pioneering cities of the Guianas, as emerging cities, are dependent on economic dynamics within the framework of globalization, which is characterized by processes of neo-extractivism, imperialist and neo-colonialist predation, made even more brutal by the United States’ stated desire to control the energy and mineral resources of this region.



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2540 - Urban System Hierarchies And Social Housing Accessibility In Post Socialist Serbia

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In post-socialist cities, the location of social housing represents an important yet insufficiently examined factor contributing to socio-spatial inequality. This study investigates the treatment of social housing locations in Serbia, as a representative post-socialist context, by comparing cities with different positions in the urban system, ranging from the capital city to regional centers and smaller towns, in order to assess how urban hierarchy influences access to everyday services.

The study adopts the 15-minute city framework as a comparative analytical tool and operationalizes it through a set of quantitative accessibility indicators. GIS-based spatial analysis is used to measure walking-distance access from social housing locations to key daily amenities, including schools, healthcare facilities, retail, green and public spaces. These indicators are analyzed across selected Serbian cities representing different urban-system positions.

This study specifically investigates whether social housing locations in higher-ranked cities benefit from denser service networks and greater functional integration compared to those in lower-tier cities. It also examines the persistence of intra-urban disparities within higher-ranked cities despite their overall advantages. Furthermore, the research analyzes how limited service provision and a city's position within the urban system affect accessibility outcomes for social housing in peripheral and lower-tier urban areas. By integrating the 15-minute city concept with an urban-systems perspective, this study seeks to contribute to debates on urban polarization and transformational change.

The authors acknowledge funding from the Marie Skłodowska-Curie Actions (MSCA) research and innovation program of the European Union's Horizon Europe (ID 101086488), and from the Ministry of Science, Technological Development and Innovation of the Republic of Serbia, through institutional financing of the Geographical Institute, “Jovan Cvijić” SASA, Belgrade (Contract No. 451-03-136/2025-03/200172).



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2732 - Migration As A Driver Of Urban Resilience Transformational Dynamics Of Contemporary Urban Systems

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Migration plays an increasingly important role in shaping the resilience of contemporary cities and urban systems. Increasing mobility, both domestic and international, interacts with long-term processes of urban transformation, influencing cities' capacities to adapt to demographic, economic, and spatial change. The aim of this paper is to demonstrate how domestic and international migration contributes to urban resilience by influencing adaptive capacities within transforming urban regions. Particular attention is given to suburbanization and periurbanization as key spatial manifestations of migration-driven change. The paper advances the hypothesis that migration should be conceptualized not only as a response to urban transformation but also as a central driver of resilience in urban systems. The theoretical discussion is supported by empirical evidence from Poland, drawing on demographic and migration data for selected functional urban areas. This approach allows for the identification of migration-related mechanisms shaping adaptive capacities in post-socialist urban contexts.

The analysis shows that migration associated with suburbanization and periurbanization can enhance urban resilience by redistributing population, reducing pressures in urban cores. At the same time, uneven migration-driven growth may generate new vulnerabilities where governance and planning capacities are limited.

Migration emerges as a key driver of both resilience and vulnerability in contemporary urban systems. Integrating migration into urban resilience frameworks provides a more comprehensive understanding of transformational urban change.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Democratising Urban Governance for Just Transitions



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1358 - Policy Evolution And Transformation Effects Of Sustainable Development In China's Resource Based Cities

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Resource-based cities (RBCs) have played a crucial role in China's industrialization but have long faced structural challenges such as resource depletion, environmental degradation, and economic path dependence. Since the early 2000s, China has implemented a series of policies aimed at promoting the sustainable development and transformation of these cities. This study hypothesizes that the evolution of these policies reflects a gradual shift from short-term problem solving toward a more integrated and sustainability-oriented governance framework, which has generated differentiated transformation effects across RBCs. The study conducts a systematic review and qualitative analysis of national-level policies related to the sustainable development of RBCs issued over the past two decades. Policy documents are examined to identify key stages of policy evolution, dominant governance logics, and major policy instruments. On this basis, the study synthesizes typical transformation pathways and assesses emerging challenges in the new development stage. The analysis shows that the policy evolution of sustainable development in RBCs follows a clear trajectory combining problem orientation and goal orientation. Three main stages are identified: a difficulty-alleviation stage characterized by administrative intervention, a comprehensive promotion stage emphasizing guidance and coordination, and a high-quality development stage featuring integrated governance. A four-dimensional policy framework has gradually taken shape, covering the transformation of resource-depleted cities, the innovative development of resource-rich cities, the upgrading of independent industrial and mining areas, and the comprehensive treatment of coal mining subsidence areas. RBCs have begun to develop diverse, locally grounded transformation models by leveraging endogenous advantages. Despite notable progress, RBCs continue to face significant challenges, including carbon reduction pressures, slowing economic growth, and persistent regional disparities. Addressing these issues requires more targeted, coordinated, and forward-looking policy efforts to consolidate transformation achievements and advance sustainable development.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Navigating Urbanization in Developing Countries: Challenges and Opportunities



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1419 - Phased Urban Expansion Drives Divergent Heating Effects Between The Global North And Global South

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Urban expansion has emerged as a major driver of surface warming worldwide, yet its net thermal effects and human exposure implications remain insufficiently quantified across different stages of urbanization and global regions. Here, we present a global analysis of phased urban expansion and its associated surface heating from the early twenty-first century onward, with a particular focus on contrasts between the Global North and the Global South. Using multi-source satellite-derived land surface temperature, urban land, population, and urban greening data, we identify distinct phases of urban expansion and quantify the net surface warming attributable to newly urbanized land.

We find that urban expansion induces a robust net surface warming signal globally, but its magnitude and temporal evolution vary substantially between regions. Cities in the Global South exhibit markedly stronger expansion-induced warming than those in the Global North, particularly during periods of rapid urban growth. This divergence is accompanied by pronounced inequalities in population heat exposure, as expansion-driven warming in the Global South coincides with higher baseline temperatures and rapidly increasing urban populations. In contrast, cities in the Global North show weaker net warming effects, consistent with more regulated expansion patterns and higher levels of urban greening.

Further analyses reveal that urban greening systematically moderates expansion-induced surface warming, although its mitigating effect is highly uneven across regions. Generalized additive models confirm that differences in urban expansion intensity, greening levels, and background climate jointly shape the observed North–South contrast in heating outcomes. Together, our findings demonstrate that phased urban expansion contributes unequally to global surface warming and population heat exposure, underscoring the critical role of urban greening and planning strategies in reducing future heat risks, particularly in rapidly urbanizing regions of the Global South.



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1765 - Mapping Inequality Spatial Justice And Basic Urban Service Disparities In Jamshedpur India

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Background / Hypothesis:

Urban transitions in industrial cities increasingly expose inequalities in basic service delivery that mirror structural, spatial, and institutional divides. This study explores Jamshedpur—India's first planned industrial city—through the lens of spatial justice and equitable infrastructure, hypothesizing that the quality and accessibility of essential services are unevenly distributed across governance regimes. The contrast between the well-served, privately managed Jamshedpur Notified Area Committee (JNAC) under Tata Steel Utilities and Infrastructure Ltd. (TSUISL) and three adjacent municipal units—Mango, Jugsalai, and Adityapur—illuminates how institutional capacity, geography, and socio-economic status shape infrastructural entitlements.

Materials and Methods:

A stratified random sample of 450 households across 74 wards was surveyed. A UNDP-inspired Basic Urban Services (BUS) Index was developed integrating dimensions of availability, affordability, and accessibility. Statistical analyses included descriptive profiling, ANOVA, chi square tests, and multivariate logistic regressions controlling for income, education, tenure, migrancy, and settlement type. Key-informant interviews (n=30) with officials, sanitation workers, and long-term residents contextualized quantitative findings using qualitative insights and secondary data from TSUISL, municipal reports, and JSAC hydrological and LULC datasets.

Results:

Large, statistically significant disparities emerged across units (ANOVA $F(3,446) = 82.5, p < 0.001$). JNAC exhibited the highest mean BUS index (0.84), Adityapur moderate (0.67), Mango below average (0.52), and Jugsalai lowest (0.42). Logistic regressions confirmed governance type and location as dominant predictors, even after accounting for household income and physiography. Perception indices corroborated these patterns, revealing acute dissatisfaction in Mango and Jugsalai.

Conclusions:

The findings underscore how infrastructural entitlements in Jamshedpur are spatially uneven, reflecting deep-rooted institutional and territorial inequities. Embedding the concept of spatial justice reveals that urban infrastructure functions as both a marker and mechanism of inequality. Strengthening municipal capacities and integrating peri urban service networks are essential for advancing equitable infrastructure across the Jamshedpur Urban Agglomeration—transforming industrial modernity into inclusive urban citizenship.



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2012 - Do Residents In Shrinking Cities Have Higher Happiness

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Subjective well-being constitutes a core pursuit of human society, and cities function as pivotal arenas for residents to pursue fulfilling lives. Amid global urbanization, urban shrinkage—a global phenomenon—poses intricate challenges to urban sustainable development and residents' well-being. Existing research on the relationship between urban shrinkage and residents' subjective well-being remains inconclusive, with a predominant focus on post-industrial shrinking cities in Western developed countries. Against the backdrop of China's distinctive urban shrinkage context and governance landscape, the impact of urban shrinkage on residents' subjective well-being merits in-depth exploration.

Drawing on data from the China Family Panel Studies (CFPS) covering 2010 to 2022, this study empirically investigates the impact of urban shrinkage on residents' subjective well-being. Furthermore, it adopts the XGBoost machine learning model integrated with SHAP interpretability analysis to decompose the key determinants of well-being and the heterogeneity in their relative weights. The findings indicate that: (1) Residents in China's shrinking cities exhibit significantly higher average subjective well-being than those in growing cities; (2) Mechanism analysis demonstrates significant structural disparities in the drivers of well-being between shrinking and non-shrinking cities. In growing cities, income and employment competition stand as dominant factors; in contrast, in shrinking cities, lower living costs, extended leisure time, and more abundant per capita environmental resources act as critical compensatory mechanisms for improving well-being; (3) Further analysis shows that the well-being advantage of shrinking cities displays significant generational and class heterogeneity, which reflects the rational adaptation of specific groups to low-cost lifestyles.

The findings of this study uncover the complex adaptability and sustainable transition potential inherent in urban shrinkage, providing Chinese empirical insights for global shrinking city governance and policy practices related to sustainable urbanization.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Promoting Urban Green Space for an Inclusive and Sustainable Cities



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2340 - Research On Urban Green Space Distribution Of Multi Perspective

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Traditional urban green space evaluation uses indicators such as percentage of greenery coverage. However, as more attention is paid to the people-oriented concept in urban construction, indicators obtained from the overhead perspective gradually cannot represent the cognition and demand for green space. Green View Index (GVI) is an index that measures people's perception of green space in the environment.

In this paper, a comparative analysis of GVI distribution based on street view image and urban vegetation type distribution based on remote sensing is carried out, and the difference of urban green spatial distribution in the Fifth Ring Road area of Beijing is discussed from the perspective of human and overlooking, and the improvement scheme of urban greening construction is proposed.

The street view image is obtained by using 250m grid as a unit. 10,912 Street View images were used, corresponding to 2,728 samples. Through image segmentation technology, the sum of the proportion of ground objects contained in green space in the images was calculated to obtain the GVI of a single image, and the average GVI of all street view images corresponding to the sampling point was calculated to obtain the sampling point GVI. The viewing direction rate of GVI (VDRGVI) was established to analyze the effects of vegetation on GVI on both sides of the road. A comparative analysis of the distribution space of GVI and green space coverage rate was carried out. The results show that green comfort zone is 65.27%, the green focus area is 9.0% and the improved green areas is 25.73% of the number of analysis grids. Analyzing the causes of low green space coverage but high GVI is helpful to improve urban greening and enhance people's green perception in the city.



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C24.45-Urban Commission: (Re-)Thinking Cities and the Urban: From the Global to the Local => Urban Growth and Landuse Change Studies



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1514 - Changes In Residential Characteristics And Building Heights Since The Late 1990s In Osaka City Japan

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Background

In Japan's major metropolitan areas, since the late 1990s, housing supply has increased in central cities, leading to a rapid population growth that had previously been declining. Furthermore, much of this housing supply consists of high-rise apartment buildings, significantly altering the urban landscape. The purpose of this study is to clarify changes in resident characteristics in Osaka City, a major city in western Japan, since 1995 through analysis of national census results. It also examines the relationship between these changes in residential characteristics and building height data.

Materials and Methods

This study utilizes population census results from 1995 to 2020 and corresponding building height data derived from aerial photographs and other sources for each time period. Using the census data, seven geodemographic types based on residential characteristics were created. These types were then used to analyze the relationship between residential characteristics and changes in building heights.

Results

The analysis revealed that until 2000, the city center was dominated by a type traditionally inhabited by business owners. However, after that point, the city center became dominated by a type consisting primarily of white-collar single-person households. Meanwhile, surrounding areas, which previously had a high proportion of blue-collar workers, transformed into areas with a mix of white-collar workers due to advancing aging and localized residential development. Furthermore, in surrounding areas with high transportation convenience, the supply of high-rise condominiums increased, leading to a rise in the white-collar worker-dominated type. Building height increased significantly in the white-collar worker-dominated types.

Conclusions

The significant increase in high-rise residential supply since 2000 has raised building heights and shifted residential characteristics toward a white-collar focus. This trend was particularly pronounced in the city center, leading to a substantial turnover of residents.



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1890 - Spatial Transformation Of Motihari Peri Urban Expansion And Driving Forces In A Small Indian Town

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Background/Hypothesis

Motihari, East Champaran district headquarters in Bihar, spans 122 km² with a 2011 population of 126,158, projected to reach 188,000 by 2026 amid rapid urbanization. Satellite comparisons (2001-2023) reveal built-up area doubling, with fragmented sprawl northwest toward Pipra Kothi and southeast along Raxaul Road, encroaching agricultural pockets on peri-urban fringes. Hypothesis posits that population influx (25.3% decadal growth 2001-2011), National Highway-28 connectivity, administrative role, informal trade (Nepal border), and post liberalization commerce drive this shift from residential-agricultural dominance (65.2%) to unplanned expansion, exacerbating flooding and congestion.

Materials and Methods

Secondary data synthesis from 2011 Census, MMC City Development Plan (2010-30), satellite imagery (Google/Bhuvan), and recent studies on morphology. Quantitative analysis of demographic trends, land use maps (67.6 ha public utilities, 10.3% vacant), workforce (tertiary/secondary heavy), housing (52% good condition) has been done to understand the spatial changes. Qualitative profiling via core-periphery framework, incorporating 2023-2025 master plan drafts on issues/potentials has also been carried out.

Results

Peri-urban northern/eastern fringes exhibit unplanned sprawl, informal housing, poor drainage; residential colonies proliferate around Moti Jheel (Miscot Nagar, Belbanwa). Growth drivers: migrant returns, vehicular surge (80% two-wheelers), agro-market hub status; built-up expansion fragments rural wards (e.g., 35-38). Challenges persist: 24% slum population, waterlogging from Burhi Gandak, limited industry despite MSMEs.

Conclusions

Unregulated peri-urban transformation underscores small-town vulnerabilities, driven by demographic-economic pressures yet constrained by ecological risks. Strategies include waterfront development (Moti Jheel), tourism (Gandhi/Kesariya circuits), agro-modernization, and infrastructure via PPPs per ongoing master plans. Balanced planning can harness decentralization for sustainable regional growth.



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2713 - The Origins Development And Typology Of Garden Cities In Poland As A Form Of Urban Growth And Suburbanisation Processes According To Ebenezer Howard's Concept

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The aim of this study is to present the results of research on settlements within the borders of modern Poland, that were related to the development of Ebenezer Howard's garden city concept (1898, 1902). This idea was a sustainable response to the urban growth, suburbanization process and deteriorating living conditions in European cities under the influence of intensive industrialisation and urbanisation (Monclús J. & Díez Medina 2018; Knight 2023). The identification process used cartographic and design materials and scientific literature. Based on historical sources, 74 settlements that met the specific criteria proposed by E. Howard were identified and examined in detail using the morphological plan analysis method. The origins and development of garden cities in Poland were analysed, and their distribution and spatial and functional characteristics were determined. Empirical research formed the basis for proposing a typology that took into account the following criteria: genetic-functional, morphological, historical metrics, toponymic, degree of implementation, and contemporary administrative and legal status (Spórna et al 2025). The results show that the first 'garden cities' appeared at the beginning of the 20th century, although most of them were created in the interwar period. However, most of them did not meet all the assumptions of Howard's original concept (including most typical garden cities, summer resorts, patronage housing estates and workers' colonies, villa districts and garden suburbs, and railway housing estates or hospital complexes, containing a large amount of green areas in their spatial development).

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2736 - Identify The Ecological Risks Of Lhasa City In 2035 Under Different Scenarios From The Change Of Ecosystem Services And Landscape

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Ecological risks, defined as potential adverse impacts on ecosystems from hazard sources, require rigorous assessment in vulnerable regions like Lhasa on the Qinghai–Tibet Plateau. This study aims to construct and predict Lhasa's ecological risks pattern and identifies areas facing risks by analyzing ecosystem ecological services and landscape ecological risks in 2035 of 3 scenarios, using Land Use/Land Cover (LULC) data, etc.. By employing land use change with InVEST and PLUS model, ecosystem services change risks (ESCR) and landscape ecological risks (LER) could be identified to evaluate the ecological risks (ERI) in the future situations including the natural developing (ND), ecological protecting (EP) and economical developing (ED). Results indicate: Grassland, the dominant land cover, have faced persistent risks of conversion to forest and bare land, mitigated significantly under EP and ED scenarios. Ecosystem service value declined from 2000 to 2015, then partially recovered by 2020; by 2035, EP yields the highest value (0.365), followed by ED (0.360) and ND (0.359). Both ESCR and LER follow ND > ED > EP. Areas with high ESCR values would be concentrated in the central built-up area, eastern meadows, and western glaciers, while high LER values are primarily found in the central built-up area, western glaciers, and Nam Co. ESCR and LER are positively correlated, strongest under ND. The integrated ecological risk index (ERI) mirrors high ESCR spatial patterns and ranks ND > ED > EP. Findings underscore that ecological protection policies can effectively alleviate ecological risks, urging their integration into future economic development planning.



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**C24.45-Urban Commission: (Re-)Thinking Cities
and the Urban: From the Global to the Local =>
UrbanGeoAI: Harnessing Multimodal AI for Smarter,
Equitable Cities**



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1354 - Treesam Visual Foundation Model For City Scale Individual Tree Detection From High Resolution Remote Sensing Images

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Accurate individual-tree detection is critical for ecological research, forest management, and urban environmental monitoring. With urban forests increasingly shaped by policy change and climate stress, the need for tree-level inventories from high-resolution satellite imagery is growing, yet complex scenes and cross-city variability limit traditional methods. We propose Tree-SAM, a SAM-derived framework for individual-tree extraction in remote sensing images. Tree-SAM freezes the pretrained SAM image encoder to retain general visual priors, and introduces a dual-stream decoder tailored to tree identification. To enhance local discrimination, we add a convolutional local feature branch with Ladder-Side-Tuning (LST) to fuse hierarchical features, using a tunable weight α to merge multi-scale maps. A lightweight scene-adaptor further calibrates segmentation thresholds and canopy coverage strategies for different urban contexts. Across forest, urban, and mixed datasets, Tree-SAM substantially outperforms ConvNeXt, Swin, and TransXNet, boosting precision by $\sim 38\%$, $\sim 30\%$, and $\sim 26\%$ and recall by $\sim 24.5\%$, $\sim 16\%$, and $\sim 12.5\%$, respectively. Generalization is validated in Shenzhen, China, where we estimate 11,963,806 trees and reveal pronounced district-level heterogeneity: Bao'an and Longgang contain 2,273,131 and 2,499,873 trees, together $\sim 39.9\%$ of the total, while Luohu and Futian have $\sim 728,883$ and $\sim 459,553$. Tree-SAM couples large-model generalization with tree-specific local cues and scenario adaptation, enabling low-cost, rapid, and scalable urban tree mapping to support planning, ecosystem assessment, and sustainable urban forest management.



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C24.46-Water Sustainability => Hydrological Extremes: Changes and Challenges of Coping



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1266 - How Glaciers Control The Streamflow Response To Extreme Summer Heatwaves In Eastern Tien Shan

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The streamflow response in three sub-basins of the upstream Urumqi River basin to the summer heatwaves during 2022–2024

was assessed using a combination of long-term observed discharge data and simulations from the previously calibrated, validated, and applied HBV-light model. The analysis revealed significant glacier mass losses at Urumqi Glacier No. 1, with the most pronounced negative mass balance observed in 2024, marking the largest loss since 1959. The observed changes in glaciers

were primarily driven by increased solar shortwave radiation and net radiation, as evidenced by energy component analysis. Streamflow responses varied significantly across the sub-basins, reflecting differences in glacier coverage. Sub-basins with glacier coverage exceeding 10% exhibited substantial increases in both ice melt runoff and total runoff. For instance, the UG1 subbasin recorded total runoff increases of 10% in 2022, 19% in 2023, and 45% in 2024, while the ZK sub-basin showed increases of 18%, 10%, and 42% over the same period. Furthermore, the runoff patterns in these glacierized sub-basins shifted from a single peak to a double peak, with snowmelt runoff occurring approximately 1 month earlier than usual. In contrast, the HX sub-basin, which has only 4% glacier coverage, exhibited a markedly different response. Despite significant increases in ice melt runoff, total

runoff in this sub-basin declined by 3% in 2022, 16% in 2023, and 18% in 2024, suggesting that enhanced ice melt was insufficient to offset the increased evapotranspiration. The high-flow period in all sub-basins was notably extended, spanning from June through August, while the timing of ice melt runoff peaks shifted from early August to late July. These findings underscore the differential sensitivities of glacierized and less-glacierized basins to extreme summer heatwaves, highlighting the critical role of glacier cover in shaping high-elevation hydrological responses to climate extremes.



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2127 - Dynamics Of Water Resources In The Small Flysch Carpathian Catchment During The Period Of Dynamic Climate Change

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Climate change is one of the most important problems facing the modern world and affects the functioning of geo-ecosystems. Mountainous areas are particularly sensitive to climate change.

The aim of the study was to assess changes in climatic conditions between 1971 and 2025 in the small mountain - foothill catchment area of Bystrzanka (Western Carpathians, SE Poland) and to determine the impact of these changes on the water resources of the catchment area and the formation of runoff. The hypothesis was that climate change is best reflected in the magnitude and temporal pattern of runoff from a small river basin. The study used daily climate data and average daily flows (hydrometric profile closing the catchment area) from the IG&SO PAS Research Station in Szymbark. Climate change was assessed using climate geoindexes: oceanism or continentalism of climate. Periods of hydrological droughts and floods were distinguished. The results of the study indicated an increase in continental climate characteristics and an increase in the number of dry and warm months in the period 1998–2025. This was confirmed by the number of days with precipitation during the year, which showed a negative (significant) trend after 2012. Over the 55-year study period, annual precipitation totals did not show a directional trend. Since 2000, a negative trend in snowfall totals has been observed, which has translated into the same direction of change in runoff during snowmelt floods.

An analysis of the structure of daily average flows throughout the year indicated a shortening of the duration of average flows, caused by an increase in the duration of drought periods. In the second half of the study period (1998-2025), a shortening of the concentration and duration of floods was observed, accompanied by an increase in flood runoff volume and maximum flow.



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C24.46-Water Sustainability => Mountain River Basins at a Crossroads: Between Hydrotechnical Use, Environmental Degradation, Resilience and Restoration Imperatives



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2620 - Investigating The Responses Of Plant Species Groups To Environmental Changes Using Uav Derived Spectral Indices

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Riparian forests, although occupying less than 1% of terrestrial surface of Europe, are characterized by exceptionally high biodiversity and provide a wide range of essential ecosystem services. Despite their ecological importance, many floodplains remain strongly degraded as a result of historical deforestation, channel regulation and contemporary biological invasions. Improving the capacity to monitor the spatio-temporal dynamics of riparian vegetation is therefore critical for effective conservation and restoration strategies.

In this study, multispectral unmanned aerial vehicle (UAV) imagery was used to investigate seasonal and short-term vegetation dynamics in the riparian corridor of the Silnica River valley in southern Poland. Four UAV campaigns conducted between May and September 2022 enabled the derivation of NDVI, NDRE, and MTCI vegetation indices, which were analysed for native, non-native and invasive plant species. The spectral metrics were linked to meteorological conditions, a topographic wetness index, and canopy structure in order to identify environmental controls on species-specific responses.

The results revealed pronounced functional differences among vegetation groups. Invasive species exhibited consistently high NDVI values combined with lower NDRE and MTCI, indicating high structural vitality but reduced physiological efficiency, suggestive of stress-tolerant strategies. In contrast, native and non-invasive species showed stronger coupling between NDVI and meteorological variability, particularly during summer and early autumn, reflecting higher sensitivity to short-term environmental fluctuations. The integration of multiple spectral indices with topographic and structural predictors provided a detailed assessment of riparian vegetation condition and allowed the detection of subtle phenological and physiological differences among species groups.

Our findings demonstrate that UAV-based multispectral monitoring offers a powerful tool for detecting plant stress, tracking invasive species dynamics, and quantifying species-specific functional responses to environmental change. This approach supports more accurate assessment of riparian ecosystem condition. The study was carried out as part of Research Project: 2023/49/B/ST10/01387 financed by the National Science Centre of Poland



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Thematic => Assessment of Environmental Impacts in Mountain Geosystems Using GIS Technologies



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1525 - Soil Erosion Response To Extreme Rainstorm In Terraced Hilly Gully Loess Area China A Case Study Of The 2024 Tongwei Rainstorm

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Against the backdrop of climate change and the increasing frequency of rainstorms on China's Loess Plateau, this study investigates the soil erosion response mechanism in the hilly and gully loess area. The 2024 extreme rainstorm event in Tongwei County, Gansu Province, which was the heaviest in 64 years with a maximum daily precipitation of 297.7mm, was taken as a typical case. Using GF-7 satellite images and UAV data, the spatiotemporal distribution of bare soil in gullies before and after the rainstorm was analyzed with GIS across 28 micro-watersheds (20.21-307.49 ha), and the area change amount and change rate were quantified. Results showed that the rainstorm caused severe soil loss, generating a large amount of bare soil on gully slopes and in channels. The increased area of bare soil in the channel of a single watershed ranged between 0.04 and 1.88 ha, with an average of about 0.80 ha; the corresponding area on the gully slope was 0.11–0.50 ha, with an average of about 0.29 ha. The increased amount of bare soil area in the channel was significantly positively correlated with runoff conditions. A regression model constructed based on the main channel gradient, runoff volume, and average channel slope could interpret 73% of the variation in channel erosion intensity. Obvious headward erosion occurred in the channels, with branch gully heads being overall more active (average retreat distance of 3.52 m) than main gully heads (average 3.10 m). The retreat was controlled by factors such as local topography and soil structure. Terraced cropland suffered serious damage, with the changed area of bare soil in a single watershed averaging about 4.00 ha, totaling 111.9 ha, which was much larger than the sum of channels and gully slopes. Overall, under extreme rainstorm conditions, while a higher proportion of terraced field area had a weakening effect on channel erosion, severe channel erosion still occurred, mainly controlled by runoff volume, channel topographic conditions, and sediment supply from gully slopes.



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**Thematic => Earth Under Stress: Geographic
Approaches to Natural Hazards and Risk Reduction**



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1293 - The Relationship Between Location Of Facilities For Persons With Special Needs And Disaster Risk In Japan

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Japan is a region prone to natural disasters. Damage from a large-scale earthquake, such as the Tokai or Tonankai Trough earthquake, and the resulting tsunami are predicted. Furthermore, within these predicted areas, some areas are at risk of flooding.

Disaster prevention measures include the construction of evacuation facilities and the implementation of evacuation drills. However, evacuation measures are insufficient not only for healthy individuals but also for those requiring special care, such as the elderly and people with disabilities. Furthermore, because the types of facilities used by these people vary, detailed consideration of facility location and evacuation feasibility is necessary.

This study therefore analyzed the number of facilities for people requiring special care that are at risk of flooding and tsunami in each municipality, targeting 60 municipalities in areas predicted to be affected by a Nankai Trough earthquake. The classification of facilities requiring special care was based on the definitions of the Ministry of Health, Labor and Welfare of Japan.

The results showed that the rate of disaster risk locations for home-visit service offices was higher than for other facility services, while the rate of disaster risk locations for facility-based services and residential services for children with disabilities was lower. This is thought to be due to the vulnerability of residents to evacuation.

Furthermore, using Nobeoka City, Miyazaki Prefecture, as a case study, an analysis of the relationship between facility establishment timing and the rate of location in disaster-risk areas revealed a tendency for facilities established in recent years to have a higher rate of being located in disaster-risk areas. This is thought to be because suitable land could not be secured in urban areas, and facilities were located in disaster-risk areas where land prices are relatively low and construction is easy.

This study analyzed the relationship between the location of facilities for people with special needs and disaster risk, focusing on differences in municipalities and facility services, and pointed out that facilities established in recent years may have a relatively higher rate of being located in disaster-risk areas.



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Thematic => Geographical Indications and Regional Development: Strengthening Local Identities and Sustainability



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1957 - Assessing Nature Based Tourism Capacity Through A Cultural Ecosystem Services Composite Index A Case Study Of The Gotse Delchev Region Southwestern Bulgaria

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Nature-based tourism is increasingly recognized as a key driver for sustainable regional development, particularly in mountainous and peripheral regions of South-East Europe. The Gotse Delchev region in Southwestern Bulgaria is characterized by high landscape diversity, valuable natural and cultural heritage, and favorable conditions for outdoor recreation, yet its tourism potential remains unevenly developed and spatially differentiated. This study aims to assess the capacity of the region's nature-based tourism potential through the application of a Cultural Ecosystem Services – Nature-Based Tourism (CES–NBT) Composite Index.

The index integrates indicators representing cultural ecosystem service supply, tourism demand, and anthropogenic pressure, following the conceptual frameworks of MAES and IPBES. CES supply indicators include landscape diversity, scenic quality, protected area coverage, trail density, and cultural heritage density. Tourism demand is captured through visitor statistics, accommodation capacity, and social-media-based proxies of recreational use, while pressure indicators reflect visitor concentration and accessibility-related stress. All indicators are spatially referenced, normalized using a min–max approach, and aggregated through a multiplicative formulation to reflect the co-production of ecosystem services and tourism use. The results reveal a high overall potential for nature-based tourism, combined with pronounced spatial heterogeneity across the Gotse Delchev region. Areas with favorable accessibility and established tourism infrastructure exhibit the highest CES–NBT values, while zones with high ecosystem quality but limited demand remain underutilized. At the same time, locations with intensive use show increased pressure on cultural ecosystem services, indicating the need for targeted management measures.

The proposed CES–NBT Composite Index provides an integrative and transferable tool for evaluating tourism capacity and supporting evidence-based planning. The approach contributes to sustainable tourism development by identifying priority areas for investment, conservation, and balanced use of natural and cultural resources.



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2120 - Historical Geographical Evolution In Ladakh Region

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Ladakh is located in the northwest of the Qinghai-Tibet Plateau, the western section of the Himalayas, and the upper reaches of the Indus River valley. It is now part of Indian-controlled Kashmir. Since ancient times, Ladakh has been the “key point” from northwest South Asia to the Ngari Prefecture of Xizang and southern Xinjiang. However, most existing research on Ladakh focuses on its local history and culture. Although there are some related works on geopolitical relations, few have studied the historical changes of this region and its subordinate relationship and geographical value with China over a long time scale and analyzed the geographical significance of Ladakh. At the same time, some erroneous views and geographical maps have been disseminated on the Internet at home and abroad, which urgently needs a comprehensive correction from the academic level. Based on a variety of historical documents, map data, and a detailed review of previous research results, this paper demonstrates the changes in place names, historical evolution, and regional scope of Ladakh from the 1st to the 21st century and analyzes its significance in the homeland security of western China. The results show that: (1) As the native land of China’s Xizang Ladakh was part of the Tubo Dynasty until the 9th century. After the collapse of the Tubo Dynasty in the middle of the 9th century, Ladakh was an essential part of the Ngari local administration established by the descendants of the Tubo Royal family. In the 13th century, Ladakh was again united within the territory of China’s Yuan Dynasty and continued through the Ming and Qing dynasties. It remained until the mid- 19th century when the Prince- state of Jammu in southern Kashmir invaded it and incorporated it into the British Indian colony. It was occupied by the Indian in 1947. (2) Ladakh region has a tortuous history with many changes in place names. However, when Jammu annexed it in modern times, Ladakh only referred to the upper reaches of Indus Valley between the Western Himalayas and the Karakoram Mountains, with Leh as the center.



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**Thematic => GIS, Climatic Parameters, Tourism,
Multifunctional Information System, Environmental
Risks**



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2541 - Photorealistic 3d Model Lightweighting Driven By Joint Appearance And Geometry Cues Via Differentiable Rendering

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Photorealistic 3D models integrate accurate geometry, structure, and appearance into a unified high-fidelity representation. With centimeter-level geometric precision and realistic visual appearance, such models enable accurate reconstruction of urban buildings, terrains, and landscapes, serving as critical data support for digital twin cities. However, the extremely dense meshes—containing massive numbers of vertices and faces—result in high storage and transmission costs. To address this challenge, we propose a high-fidelity model lightweighting framework driven by joint appearance and geometry cues, leveraging differentiable inverse rendering and self-supervised optimization strategies. The proposed method exploits the coupling between geometry and photometric characteristics to steer the simplification process, allowing the construction of compact models that preserve both global conformality and multi-scale structural details. This ensures high appearance consistency and geometric fidelity with respect to the original model, even under aggressive reduction ratios. Extensive experiments demonstrate the effectiveness of the approach: when the polygon count is reduced to only 5% of the original, the resulting model yields a geometric error as low as 0.0124, while achieving strong visual consistency with SSIM = 0.9746, PSNR = 32.16, and LPIPS = 0.0266. These results confirm that the proposed framework enables high-fidelity lightweight photorealistic modeling suitable for scalable and real-time digital twin applications.



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Thematic => Historical Geography of East Asia



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1424 - The Silk Road The World Seen By Japanese Sericulturist In The Meiji Era

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Background / Hypothesis

This poster examines how Japanese people in the Meiji era (1868–1912) perceived foreign countries. During this period, Japan began to accept various technologies and ideas from Western countries. As a result, Japanese ways of thinking and systems of values underwent significant changes. This poster analyzes the travel diary of a sericulturist who traveled to Italy in 1880 to reveal his perceptions of foreign countries and how he applied the insights gained during his travels after returning to Japan.

Materials and Methods

The primary material used in this poster is “Yoko Ryochu Kenbun Nisshi” (Diary of Travels to Western Countries). The author of this diary is Tajima Buhei, a sericulturist from Gunma Prefecture, Japan. “Yoko Ryochu Kenbun Nisshi” contains information and impressions of scenery and sericulture in Italy and other regions that Tajima visited. By analyzing these descriptions, this study clarifies how sericulturists perceived various overseas regions and how they considered the future development of Japanese sericulture based on examples from other countries.

Results

Tajima described in detail not only the scenery of the places he visited but also the local people. His accounts reveal a strong admiration for Western countries, where urbanization was advancing through modernization. He also highly praised the distinctive sericulture practices and raw silk processing techniques he observed in the various regions he visited.

Conclusion

Tajima’s perceptions of foreign countries reflect a sense of admiration for the West that was prevalent in a modernizing Japan. During the Meiji period, many advocated emulating Western countries, and this admiration took root among sericultural farmers such as Tajima. Furthermore, Gunma Prefecture became a leading center of sericulture in Japan after the Meiji era. This development was supported by individuals like Tajima, who actively sought to introduce overseas technologies. Although “Yoko Ryochu Kenbun Nisshi” represents the experiences of a single sericulturist, it demonstrates that Japan was moving toward modernization and that sericulture was developing as a new industry.



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2304 - Merchants Moving Through “imperial Japan” A Case Study Of The Japanese Repatriation From The Russian Far East In The Early 1920s

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This presentation focuses on Japanese merchants who conducted business in Vladivostok from the late Meiji to the Taisho period. By analysing their activities after they repatriated, the presentation aims to shed light on how the economic sphere around the Sea of Japan was restructured before WW2.

The number of Japanese immigrants to Vladivostok, a key city in the Russian Far East, increased from the 1890s onwards. Around 1920, partly due to the Siberian Intervention, the resident population reached approximately 5,000. However, following the withdrawal of troops, a succession of repatriations led to a decline in numbers. By 1919, some 140 shops were operating.

Some merchants settled permanently to conduct business there, while others based themselves in mainland Japan and established branches locally.

They were forced to withdraw their business operations due to changes in the local social situation, but much remains unknown about their movements around the time of the ‘repatriation’.

Following the Russo-Japanese War, the government initiated relief policies to address the economic losses suffered by Japanese nationals abroad due to the conflict. Relief measures, including the provision of relief funds, were also implemented for Japanese nationals who ‘repatriated’ between 1917 and 1922, the period spanning the Russian Revolution to the Siberian withdrawal. Documents submitted by repatriated merchants to the Minister for Foreign Affairs via prefectural offices and overseas missions, requesting relief payments, are preserved at the Diplomatic Archives. In 1923, 2,057 applications were submitted. Alongside the applicant’s name, occupation, registered domicile, and current address (their destination after repatriation), these documents detail quantitative and qualitative data including the circumstances leading to repatriation, the duration of business operation in the local area, capital amount, average annual income, contributions to the Japanese Residents’ Association, and taxes paid to local authorities.

Using the above historical materials, we examine geographically the merchants who “relocated” within the territories of Imperial Japan, including the mainland, Korea, and Manchuria, by tracing their migration history and economic realities.

By focusing on Japanese merchants active in Vladivostok from the late Meiji to late Taisho periods and analysing their business activities following their “repatriation” to mainland Japan, Korea, and Manchuria, it became apparent that Imperial



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**Thematic => Climate Change Impacts on River
Hydrology and Floodplain Processes**



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2528 - Monitoring And Quantifying River Channel Dynamics In A Changing Climate With Remote Sensing And Machine Learning

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Observing and quantifying river channel morphological and hydraulic dynamics under climate change is essential for hydrologic and hydraulic modeling, flood forecasting, sediment transport assessment, and ecosystem monitoring. Yet conventional hydrographic surveys are largely static and spatially incomplete, limiting the parameterization of modern hydrologic-hydraulic models, especially for applications that require spatially explicit channel conditions, such as flood-inundation mapping (FIM). This study presents a fine-tuned deep-learning foundation model that retrieves river-channel morphological and hydraulic attributes and their temporal dynamics by integrating Sentinel-1 SAR time series with SWOT observations. The approach operationalizes and scales channel hydrofabric production from basin to national extents by combining SAR-based channel delineation with SWOT-derived water-surface elevation. We demonstrate the workflow in the Mobile River Basin, USA, producing a consistent, georeferenced, high-resolution dataset of channel morphology and hydraulics for both dry and wet seasons. Outputs include raster and vector channel representations (grids and shapefiles), banklines and centerlines, planform metrics (width, curvature, sinuosity, braiding index), bar metrics (area and density), and time-stamped water-surface elevation and slope, enabling quantitative analysis of seasonal and event-driven channel change. By delivering standardized, high-quality channel morphology and hydraulics, this work addresses a critical data gap for basin- to national-scale hydrologic prediction systems and supports improved flood forecasting and FIM, sediment-dynamics assessment, and climate-adaptation planning.

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