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A Systematic Literature Review of Coastal and Marine Tourism Within Marine Protected Areas in Sub-Saharan Africa (2015–2025)

ABSTRACT

Coastal and Marine Tourism (CMT) is increasingly acknowledged as a significant component of conservation-oriented development in Sub-Saharan Africa; however, research addressing CMT within Marine Protected Areas (MPAs) remains fragmented. This systematic review synthesised peer-reviewed journal articles published between 2015 and 2025 to identify key characteristics, opportunities, and challenges related to CMT within MPAs and adjacent coastal areas in the context of conservation development. Searches were conducted using the databases Taylor & Francis Online, ScienceDirect, Google Scholar, and EBSCOhost, with the final search completed in November 2025. A structured screening process resulted in the inclusion of 22 systematically relevant articles published across 13 peer-reviewed journals. Inclusion criteria comprised empirical and conceptual peer-reviewed studies focusing on CMT within and around MPAs in Sub-Saharan Africa. Exclusion criteria eliminated grey literature, studies not addressing CMT or MPAs, and publications not written in English. The reviewed literature indicates that CMT within MPAs predominantly focuses on marine wildlife tourism. The synthesis employed a qualitative narrative approach, and study quality was assessed using appropriate evaluation criteria. While CMT is widely perceived as a mechanism for generating financial value and supporting development through enhanced conservation awareness, several studies highlight emerging behavioural disturbances affecting marine species, limited community involvement, and development challenges related to the societal legitimacy of MPAs. Overall, current trends suggest the presence of both substantial opportunities and notable risks, particularly concerning citizen involvement in scientific agendas. Key limitations of this review include publication bias, language restrictions, and reliance on search engines and databases for indexing.

Keywords: coastal tourism, marine tourism, marine protected areas, Sub-Saharan Africa, tourism sustainability, marine wildlife tourism, citizen science

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INTRODUCTION

Coastal and Marine Tourism (CMT) is emerging as a dynamic sector of tourism development in Sub-Saharan Africa, closely linked to Marine Protected Areas (MPAs). As countries in Sub-Saharan Africa transition towards an ocean-based economy, coastal destinations across the region have experienced increasing tourism demand, alongside growing complexity in maritime-related activities (March et al., 2024). The rising interest in coastal and marine environments places MPAs at the intersection of conservation concerns and tourism development objectives, resulting in a complex relationship among conservation, local communities, and revenue generation within MPAs in Sub-Saharan Africa. Much of the existing knowledge on CMT in the region remains dispersed across multiple countries, thematic issues, and methodological approaches within the scientific literature.

Based on previously consulted literature, a diverse range of tourism types operates in and around MPAs. Marine wildlife tourism represents a particularly prominent component, encompassing activities such as shark cage diving, whale watching, dolphin swimming, and whale shark encounters (Haskell et al., 2015; Geldenhuys et al., 2019; Dicken et al., 2025). Studies conducted in Mozambique also demonstrate that dolphin swimming activities constitute a pressure point for dolphin populations, with significant behavioural disruptions observed despite the implementation of control measures (Rocha et al., 2023). Similarly, research from Madagascar highlights both the financial value and conservation importance of marine wildlife tourism, particularly in areas characterised by a high presence of whale sharks (Ziegler et al., 2021).

Another strand of the literature focuses on socio-governance issues. In South Africa, challenges related to community access, historical inequalities, and limited participatory processes have been shown to influence perceived levels of support for MPAs, as well as their management effectiveness (Sowman & Sunde, 2018). More comprehensive evaluations of governance frameworks further identify challenges related to inadequate coordination, weak enforcement, and inequitable benefit distribution, all of which negatively affect conservation outcomes (Kirkman et al., 2023). Perceptions among local residents in Nungwi villages in Zanzibar similarly reveal mixed social impacts of tourism development, including employment opportunities alongside rising living costs and cultural pressures (Timothy & Said, 2023).

Emerging research on visitor engagement and learning offers promising pathways for strengthening linkages between tourism and conservation. Marine citizen science initiatives, both in general terms and through specific examples such as kelp forest projects in South Africa, demonstrate potential to enhance tourists' levels of understanding, critical reflection, and engagement in concrete conservation actions (Lucrezi, 2024; Lucrezi & D'Agnessa, 2025).

Despite the valuable insights provided by the literature, existing research remains fragmented across diverse themes, geographical contexts, and publication outlets. An initial assessment of publication patterns illustrates this dispersion, with the 22 reviewed studies published across no fewer than 13 academic journals. The African Journal of Hospitality, Tourism, & Leisure accounts

for the largest share (18.18%) of the reviewed publications, followed by the Journal of Ecotourism (13.64%) and Tourism in Marine Environments (13.64%). Given the recognised ecological value of MPAs and the growing economic significance of CMT, greater integration of existing evidence is required to more comprehensively inform understandings of opportunities, challenges, and regulatory implications associated with CMT in MPAs. Accordingly, to better identify prevailing patterns in the literature and draw attention to significant research gaps, this systematic literature review focuses on studies published between 2015 and 2025, examining critical issues related to CMT within MPAs in Sub-Saharan Africa. The purpose of this review is therefore to systematically locate, synthesise, and critically evaluate both empirical and conceptual studies of CMT conducted within or in proximity to MPAs across Sub-Saharan Africa.

METHODS

This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which facilitate transparency, reproducibility, and the systematic identification, screening, and synthesis of available literature for this study (Dramba et al., 2025). The review aimed to compile peer-reviewed literature focusing on Coastal and Marine Tourism (CMT) within Marine Protected Areas (MPAs), as well as coastal conservation zones in Sub-Saharan Africa, published between 2015 and 2025.

Conceptual Definitions and Analytical Framework

To ensure a clear understanding of the concepts framing the analysis and to maintain consistent use of terminology, this study draws on the concepts of coastal and marine tourism, marine protected areas, the blue economy, and governance.

According to Rogerson and Rogerson (2019), CMT refers to tourism activities occurring within coastal environments or marine ecosystems, including land-based tourism along coastlines and marine-based tourism involving wildlife observation, scuba diving, and boat cruising. In this review, particular emphasis is placed on forms of CMT that involve direct interaction with sensitive marine ecosystems and protected marine spaces (Lucrezi, 2024). Sowman and Sunde (2018) and Kirkman et al. (2023) define MPAs as clearly delineated marine and coastal areas that are effectively or formally managed to achieve the long-term conservation of nature, associated ecosystem services, and cultural heritage. Within this review, MPAs are examined not only as conservation instruments but also as socio-economic and governance spaces where tourism development, local livelihoods, and conservation objectives intersect.

The concept of the blue economy refers to the sustainable use of ocean, marine, and coastal resources to drive economic growth, improve living standards, and generate employment while maintaining the health of marine and coastal ecosystems (Rogerson & Rogerson, 2019; March et

al., 2024). In Sub-Saharan Africa, blue economy policy frameworks increasingly integrate CMT and MPAs as mechanisms to advance both socio-economic development and conservation objectives. The concept of governance refers to the formal and informal institutions, policies, and decision-making arrangements through which MPAs and related tourism activities are planned and managed to ensure effective regulation and conservation outcomes (Hugé et al., 2018; Kirkman et al., 2023).

Together, these thematic concepts provide the analytical foundation for this systematic review, as they enable an integrated examination of how tourism activities within and around MPAs relate to conservation, socio-economic, and governance dimensions under blue economy strategies in Sub-Saharan Africa. To maintain conceptual clarity and terminological consistency throughout the review, the key concepts underpinning the analytical framework are defined in Table 1. These definitions form the basis for the subsequent conceptual synthesis of the literature on coastal and marine tourism in marine protected areas in Sub-Saharan Africa.

Table 1. Key Concepts and Their Application in This Review

Concept	Definition Adopted in This Review	Relevance to Analysis
Coastal and Marine Tourism (CMT)	Tourism activities that take place in coastal and marine ecosystems, for instance, wildlife tourism and nature-oriented tourism.	Core focus of reviewed studies; links tourism demand with ecological and social impacts
Marine Protected Areas (MPAs)	Marine spaces that are legally and effectively governed with the objective of the long-term conservation of ecosystems and cultural values	Spatial and institutional context within which tourism–conservation interactions occur
Blue Economy	Sustainable use of marine resources to drive economic development and maintain the integrity of ecosystems.	Policy framework shaping tourism development and conservation priorities
Governance	Institutional framework, policies, and engagement processes that help govern the administration of MPAs as well as associated tourism	Analytical lens for assessing legitimacy, participation, and management effectiveness

Search Strategy

A structured search of academic databases commonly used in tourism-related research, as well as in environmental science and maritime studies, was conducted using the following search terms:

- Coastal and marine tourism
- Marine protected areas
- Marine conservation
- Marine wildlife tourism
- Sub-Saharan Africa tourism

Boolean operators were applied using combinations such as:

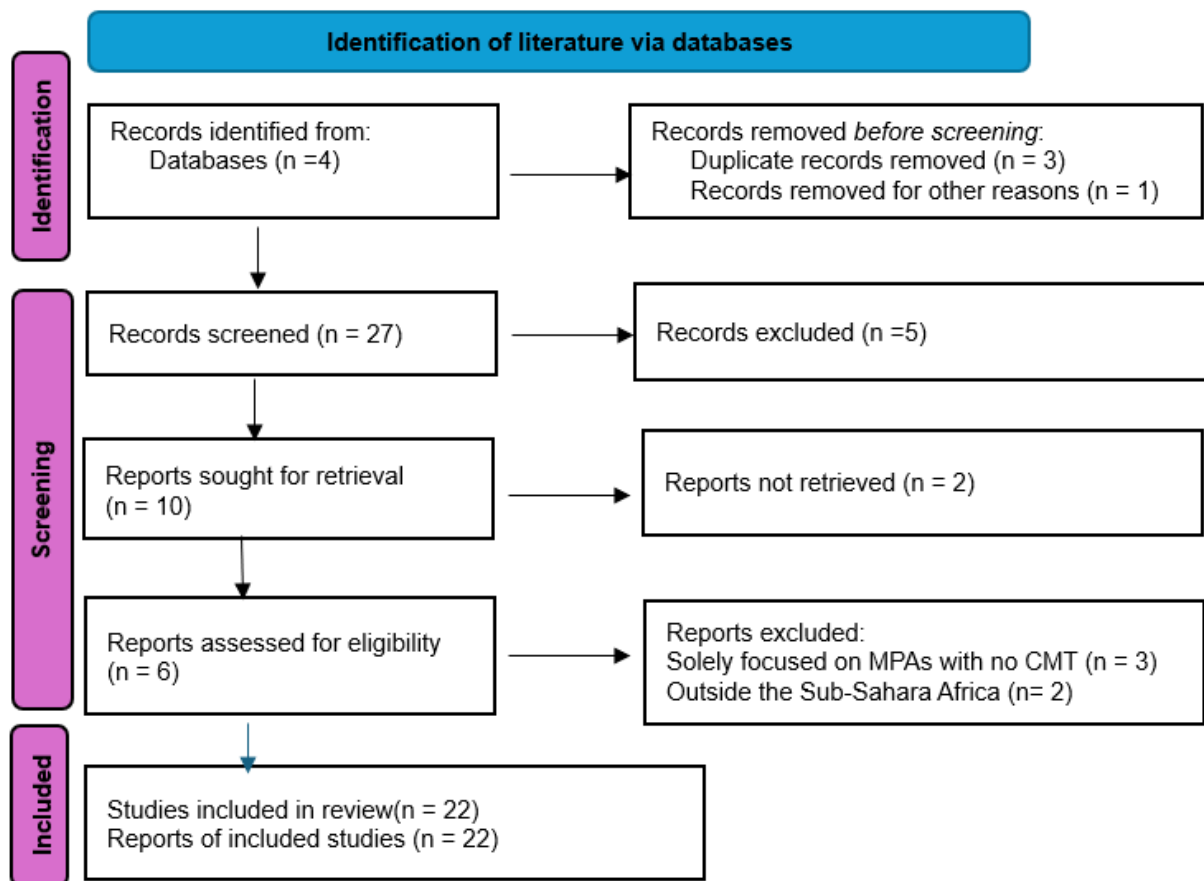
- Coastal tourism AND Marine Protected Areas AND Africa
- Coastal tourism AND community participation AND conservation
- Marine wildlife tourism AND MPA

- Sub-Saharan Africa AND tourism AND MPA
- Blue economy AND tourism AND “marine protected areas”

The articles reviewed comprise peer-reviewed publications in scholarly journals published between January 2015 and November 2025. The databases consulted are listed below, and the process of literature identification through these databases is illustrated in Figure 1.

- Taylor & Francis Online
- ScienceDirect
- Google Scholar
- EBSCOhost

Figure 1. PRISMA Flow Diagram for New Systematic Reviews Which Included Searches of Databases and Registers Only



Source: Page et al., 2021.

Methodological Transparency and Reproducibility

To enhance reproducibility and ensure methodological rigor, this review provides comprehensive documentation of the search process, inclusion and exclusion criteria, and the quality assessment procedure.

Search strings and queries

The searches were conducted using sets of predefined keywords and Boolean operators tailored to each database. The base search strings included: “coastal tourism” OR “marine tourism” AND “marine protected area” OR MPA AND Africa; “marine wildlife tourism” AND “marine protected area”; “blue economy” AND tourism AND “marine protected area”; and “community participation” AND tourism AND conservation. Searches were restricted to articles published in peer-reviewed journals between January 2015 and November 2025, and only English-language publications were considered.

Inclusion and exclusion criteria

Studies were included if they addressed tourism activities within or around Sub-Saharan Africa and presented findings related to ecological/systems, socio-economic, governance, and management issues relevant to tourism. In contrast, exclusion criteria comprised studies that focused solely on fisheries and marine ecology without a tourism component; were conducted outside Sub-Saharan Africa or in Central Sub-Saharan Africa, as this region is not coastal; presented grey or non-scholarly literature; or failed to meet the required quality assessment threshold. The inclusion and exclusion criteria are outlined below.

Studies that met the following criteria were considered for analysis:

- Primarily focused on tourism activities occurring within MPAs, near MPAs, or in designated coastal conservation areas in Sub-Saharan Africa.
- Presented empirical results related to ecological effects, visitor behavior, socio-economic outcomes, community attitudes, governance, and regional management in the context of tourism.
- Published in peer-reviewed journals between 2015 and 2025.
- Written in English.

Studies were excluded if they:

- Focused exclusively on fisheries, marine biology, or conservation without including a tourism component.
- Were conducted outside Sub-Saharan Africa (study area).
- Were conducted in Central Sub-Saharan Africa, as the region is not coastal.
- Were non-empirical in nature (e.g., editorials or commentaries).
- Consisted of reports or grey literature.
- Did not meet the appraisal criteria.

Screening and Coding Processes

The screening process was conducted in three phases: title screening, abstract screening, and full-text screening. Eligible studies were systematically coded according to publication details, study locations, tourism type variables, adopted methodologies, and the primary domains of interest addressed in the studies. These domains included issues related to wildlife tourism. The screening process consisted of the following phases:

1. Title screening, during which records that clearly did not relate to either CMT or MPAs were removed.
2. Abstract screening, which applied both the inclusion and exclusion criteria.
3. Full-text screening, conducted to determine final eligibility for inclusion in the study.

Following this screening procedure, a total of 22 articles were retained for analysis. These articles were subsequently coded based on variables such as source of publication, topic, methodology, and location. A PRISMA flow diagram, presented as Figure 1 above, illustrates the stages of identification, screening, eligibility, and inclusion of articles in this study.

Quality Appraisal

To ensure methodological rigor and minimize potential bias during data interpretation, a structured quality appraisal was conducted for each of the 22 studies included in the review. An appropriate quality assessment checklist was developed, drawing on standards from widely used critical appraisal frameworks. Each study was assessed against ten criteria, including:

1. clarity of the research aims;
2. appropriateness of the study design;
3. clarity of the data collection process;
4. appropriateness of the sampling methodology;
5. rigor of data analysis;
6. clarity of data presentation;
7. discussion of study limitations or potential sources of bias;
8. discussion of ethical considerations;
9. validity of the conclusions drawn; and
10. relevance of the study to the topic of interest.

Each criterion was evaluated using three categories—*Yes*, *Partly*, or *No*—allowing for a transparent and straightforward assessment of the methodological strengths and weaknesses of the studies without reliance on overly prescriptive numerical scoring systems. Studies that performed poorly were excluded, and the search terms were reapplied in the databases to identify replacement studies for those removed.

Data Extraction

A standardized data extraction process was employed to identify relevant information from each paper, including the study location, type of tourism, results related to socio-economic and ecological impacts, issues of governance and management, and community perceptions. Publication characteristics—such as the name of the journal, year of publication, and type of publication—were also extracted to support the analysis of publication trends.

Synthesis Approach

Given the diversity of methodologies and perspectives on CMT within MPAs, a narrative and thematic synthesis approach was deemed appropriate for this review. This approach allows for the integration of findings from diverse studies and facilitates the identification of key themes related to CMT, including wildlife-based tourism, ecological impacts, governance, community perceptions, motivations, and citizen science-based CMT concepts for conservation. Results from descriptive analyses, such as the frequency of studies across different journals, were also incorporated into the synthesis for this purpose.

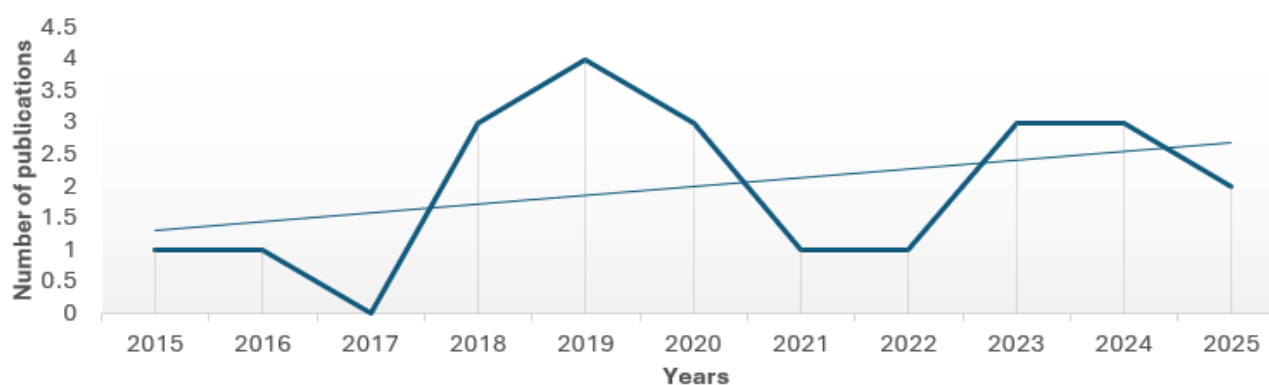
RESULTS

This chapter presents the findings of a systematic review of 22 peer-reviewed studies on CMT in MPAs in Sub-Saharan Africa published between 2015 and 2025. The results are organized thematically and capture both the empirical evidence and its interpretation in order to provide an integrated synthesis of the findings.

Publication Trends and Scholarly Growth in CMT Research

Trends in the volume and focus of publications addressing CMT in relation to MPAs in Sub-Saharan Africa between 2015 and 2025 are illustrated in Figure 2 below. The data indicate a steady increase in scholarly output over the period, with a notable rise in publication intensity from approximately 2020 onward. This pattern reflects growing academic and policy interest in marine conservation and blue economy initiatives, as well as in the role of MPAs as dual-functional spaces that support both marine conservation and tourism development.

Figure 2. Coastal and Marine Tourism in MPAs Publications Between 2015–2025.



Source: Researcher's own construct

Institutional and Geographic Distribution of Research

Table 2 presents the distribution of the reviewed articles across different journals. The *African Journal of Hospitality, Tourism, and Leisure* accounts for the largest share of publications, representing 18.18% of the reviewed articles, followed by the *Journal of Ecotourism* and *Tourism in Marine Environments*, each contributing 13.64%. This distribution indicates that tourism-focused journals serve as the primary outlets for disseminating CMT research related to MPAs.

The growing contribution of journals from other disciplines, including marine policy, ocean and coastal management, and biological conservation, further underscores the interdisciplinary nature of marine tourism research.

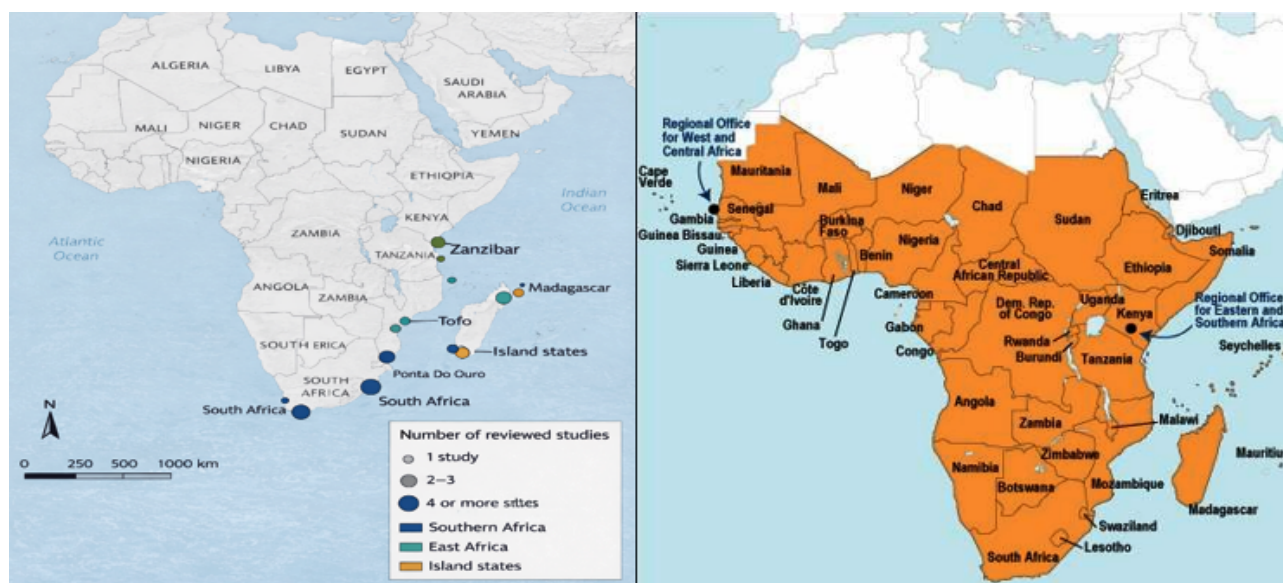
Table 2. Distribution of Articles by Journal

Journal Name	Number of Articles	Percentage (%)
African Journal of Hospitality, Tourism and Leisure	4	18.18%
African Journal of Marine Science	2	9.09%
Oryx	1	4.55%
Ocean and Coastal Management	2	9.09%
Journal of Outdoor Recreation and Tourism	1	4.55%
Journal of Ecotourism	3	13.64%
Tourism in Marine Environments	3	13.64%
The Journal for Transdisciplinary Research in Southern Africa	1	4.55%
Marine Policy	1	4.55%
Biological Conservation	1	4.55%
Urbani Izziv	1	4.55%
PloS One	1	4.55%
Heliyon	1	4.55%

The distribution of research locations shown in Figure 3 reveals a strong concentration of studies in Southern Africa, particularly along the South African coastline, where numerous MPAs and a well-established research infrastructure are present. A secondary concentration is observed along the East African coastline and in island nations, including Zanzibar, Mozambique, and Madagascar. In contrast, there is a pronounced underrepresentation of research in West and Central Sub-Saharan Africa. This imbalance reflects disparities in research infrastructure and capacity rather than shortcomings in the review process.

An analysis of institutional affiliations, as presented in Tables 4 and 5, further confirms this imbalance, indicating the dominance of South African universities as lead institutions. North-West University alone accounted for more than a quarter of the sampled studies. Although cross-border collaborations involving institutions from the United Kingdom, Belgium, and Poland were identified, the relatively low representation of East African institutions highlights persistent inequalities in knowledge production within Sub-Saharan Africa.

Figure 3. Geographical Distribution of CMT Research Sites Within or Adjacent to MPAs in Sub-Saharan Africa (2015–2025).



Note: Circle size indicates the number of studies per location. Source: Researcher's own construct based on reviewed studies; base map adapted from Johnson (2012).

Table 3. Number of Articles per Institutional Affiliation

Affiliation	Number of Articles	Percentage (%)	Affiliation Country
North-West University (TREES)	6	27.3%	South Africa
University of Cape Town (UCT)	1	4.5%	South Africa
University of KwaZulu-Natal	1	4.5%	South Africa
University of Zululand	1	4.5%	South Africa
KwaZulu-Natal Sharks Board	1	4.5%	South Africa
Nelson Mandela University / DFFE	1	4.5%	South Africa
University of Johannesburg	1	4.5%	South Africa
Cape Peninsula University of Technology	1	4.5%	South Africa
Vaal University of Technology	1	4.5%	South Africa
University of Portsmouth	2	9.1%	United Kingdom
University of Exeter	1	4.5%	United Kingdom
Scotland's Rural College (SRUC)	1	4.5%	United Kingdom
University of St Andrews	1	4.5%	United Kingdom
Hasselt University	1	4.5%	Belgium
University School of Physical Education in Wrocław	1	4.5%	Poland
Madagascar Whale Shark Project / Marine Megafauna Foundation	1	4.5%	Madagascar
State University of Zanzibar	1	4.5%	Tanzania

Table 4. Regional Affiliation Breakdown

Region	Number of Articles	Percentage (%)
Southern Africa (South African universities)	13	59.1%
Europe (UK, Belgium, Poland, Scotland)	7	31.8%
East Africa (Zanzibar, Madagascar NGOs)	2	9.1%

Dominance of Marine Wildlife Tourism

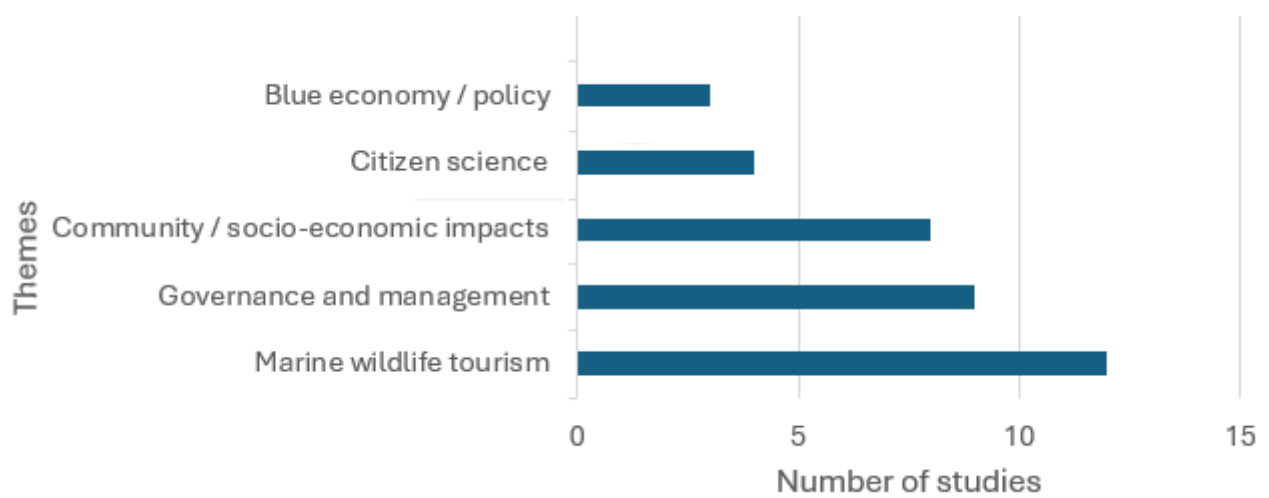
Thematically, marine wildlife tourism emerges as the dominant focus within the reviewed literature, accounting for 54.5% of the studies (Table 3). Activities such as shark cage diving, whale watching, dolphin swim tourism, and whale shark tourism feature prominently both in practice and in the academic literature. The prominence of these activities reflects the role of charismatic marine species within MPAs as key tourist attractions, which underpins their widespread representation in tourism development and in the reviewed studies.

Table 5. Frequency of Major Themes in Reviewed Studies (n = 22).

Theme	Number of Studies	Percentage (%)
Marine wildlife tourism	12	54.5
Governance and management	9	40.9
Community perceptions / socio-economic impacts	8	36.4
Citizen science / education	4	18.2
Blue economy / policy framing	3	13.6

Figure 4 further illustrates the relative weighting of thematic domains, revealing a pronounced emphasis on marine wildlife tourism research, followed by governance and management themes, while comparatively limited attention is devoted to citizen science and blue economy frameworks.

Figure 4. Frequency of Major Thematic Areas Addressed in CMT Research Within MPAs.



Source: Researcher's own construct

The findings consistently indicate that these activities have ecological implications, particularly in governance contexts characterized by weak regulatory enforcement. Documented disturbances to marine wildlife behavioral patterns—such as feeding and resting cycles—have been associated with dolphin swim tourism and whale watching in Mozambique and South Africa. From a socio-ecological systems (SES) perspective, these studies illustrate how tourism demand can place stress on ecosystems, especially where mechanisms to mediate interactions between society and ecology are insufficient. Despite the important role of marine wildlife tourism in financing and promoting conservation, these activities require adaptive and well-regulated management frameworks.

Governance, Policy, and MPA Legitimacy

Governance and management themes are addressed in 40.9% of the reviewed literature, highlighting persistent challenges related to regulatory enforcement, institutional coordination, public engagement, and benefit-sharing. The literature suggests that non-participatory governance arrangements negatively affect the perceived effectiveness and legitimacy of MPAs. In the South African context, a lack of equity and limited community participation in decision-making processes have been linked to opposition toward MPAs and conservation-oriented tourism development. Overall governance assessments emphasize the importance of joint and equitable governance systems that actively involve all stakeholders, including tourism operators and conservation authorities. Such governance systems play a critical mediating role in balancing ecosystem protection with tourism development.

Community Participation and Socio-economic Outcomes

Socio-economic issues are discussed in 36.4% of the reviewed studies. While CMT contributes to employment generation and economic activity, the literature indicates that its socio-economic impacts are often uneven, resulting in increased living costs for coastal communities. Case studies from Zanzibar and South Africa highlight that benefits frequently accrue to a limited group of stakeholders, with minimal gains for local communities. The findings suggest that limited participation and inequitable benefit-sharing contribute to the long-term unsustainability of CMT in MPAs. From a socio-ecological perspective, inequities in both social and ecological dimensions reduce the resilience of social-ecological systems and contribute to system degradation. The results clearly indicate that meaningful community development is essential for sustainable tourism integration.

Citizen Science and Educational Tourism as Emerging Pathways

Citizen science and educational tourism emerge as relatively new and underrepresented themes, appearing in 18.2% of the reviewed studies. Research conducted in South Africa indicates that participation in marine citizen science initiatives enhances tourists' environmental knowledge, critical reflection, and conservation-oriented behavior. Regardless of geographical scale, the findings suggest that citizen science and educational tourism offer promising avenues for rethinking tourism as a proactive component of conservation efforts rather than merely a source of ecological pressure. When framed within a socio-ecological systems approach, these strategies contribute to more integrative and adaptive governance models.

Knowledge Gaps, Regional Imbalances, and Implications for Generalisability

The results reveal pronounced institutional and geographical imbalances in the existing literature. Research is heavily concentrated in South Africa, with minimal contributions from East African island states and no identified studies from West or Central Sub-Saharan Africa. While these patterns reflect disparities in research infrastructure and funding, they raise significant concerns regarding the generalisability of the findings across the broader Sub-Saharan African region. Evidence derived from well-established MPAs and mature tourism systems may not adequately capture the realities of less-studied regions. Consequently, although the thematic findings of this review provide valuable insights into community-based marine tourism within MPAs, they should be applied cautiously when extrapolated to other geographic and institutional contexts.

CONCLUSIONS

This systematic literature review integrates peer-reviewed studies published between 2015 and 2025 that address CMT-related activities occurring within and around MPAs in Sub-Saharan Africa. The review employs a combination of narrative, quantitative, and spatial approaches to examine the interactions between tourism and conservation within a socio-ecological systems (SES) framework. The analysis reveals that the existing body of research is overwhelmingly focused on marine wildlife tourism activities, including shark diving, dolphin swim tourism, whale watching, and whale shark tourism. These activities are widely promoted for their economic value and their role in raising awareness for marine conservation; however, the reviewed literature also documents associated ecological risks. In particular, organized tourism activities that alter marine wildlife behavioral patterns tend to proliferate in contexts characterized by weak regulatory regimes.

These findings underscore the need for robust state- and policy-level frameworks, including co-management arrangements for MPAs, effective enforcement mechanisms, and accountability structures supported by transparent financial benefit-sharing. Such measures are essential to ensure

that tourism activities remain within ecological limits while maintaining stakeholder support. Evidence from community-focused research further indicates that although tourism activities generate employment opportunities, they often result in uneven benefit distribution, exacerbating socio-economic inequalities and, in some cases, provoking resistance to conservation initiatives. Addressing these challenges requires enhanced community engagement, equitable benefit-sharing mechanisms, support for community-managed tourism enterprises, prioritization of local employment and training, and the incorporation of traditional ecological knowledge (TEK) into tourism planning and management processes.

An important emerging trend within the reviewed literature relates to citizen science and educational tourism, which demonstrates growing potential to contribute to ecological knowledge production and conservation management. Although these initiatives remain limited in both geographic scope and number, they suggest that tourism can function as a proactive component of adaptive management rather than merely as an extractive economic activity. This potential may be further strengthened through the integration of citizen science into tourism experiences, the development of conservation- and education-oriented tourism products, and the use of MPAs as living laboratories for research and environmental education aimed at influencing behavioral change through tourism.

The review also highlights fundamental inequalities in knowledge production, particularly in terms of institutional affiliation and geographic focus. The majority of studies are concentrated in South Africa, both with respect to research locations and author affiliations. Contributions from East African island states are comparatively limited, and no studies were identified from West or Central Sub-Saharan Africa. While these patterns largely reflect disparities in research infrastructure and funding, they significantly constrain the generalisability of the findings across the broader Sub-Saharan African context. Nevertheless, no systematic bias was identified in the review process itself. To address these inequities, future research should expand beyond South Africa, incorporate inter- and transdisciplinary approaches, and support long-term monitoring programs to inform tourism and conservation policy across the region.

Taken collectively, the findings suggest that the future of CMT as a sustainable practice within MPAs depends not merely on the expansion of tourism activities, but on the alignment of ecological limits, participatory governance structures, and equitable benefit-sharing mechanisms. Achieving this requires the adoption of low-impact and sustainable tourism models, including regulated visitor numbers, clear guidelines for wildlife interactions, and comprehensive environmental monitoring at the conservation level. Ultimately, the sustainability of CMT within MPAs in Sub-Saharan Africa will be determined by the extent to which tourism development is embedded within inclusive, adaptive governance frameworks that are responsive to socio-ecological feedbacks and supported by an expanded and regionally representative research agenda. This necessitates a shift beyond the commercialization of wildlife-based tourism toward more integrative and conservation-oriented models.

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Silk Road and Middle Corridor: Energy and Transit Opportunities for Eurasia

ABSTRACT

The history of the Silk Road, which played an irreplaceable role in shaping economic, cultural, and political worldviews as a source of cross-cultural dialogue and scientific exchange between the East and the West, began in the 2nd century BC and lasted until approximately the beginning of the 16th century AD. Unfortunately, geopolitical processes that have taken place in the world, including wars, led to the collapse of the Great Silk Road. However, initiatives to restore the Silk Road were launched by the end of the last century. These initiatives were mostly developed during the post-Soviet period. Building a new Silk Road is a guarantee of lasting peace, security, and development for the countries along its route. The realization of this project also plays an important role in promoting global cooperation, long-term economic stability, and energy security in international trade. The active participation of countries makes a significant contribution to the restoration of the Silk Road. This study aims to identify the main initiatives proposed for the restoration of the Silk Road and the emerging perspectives for the economic development of countries in world trade.

Keywords: Silk Road, TRACECA, Belt and Road Initiative, Middle Corridor, energy and transit

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INTRODUCTION

The ancient Silk Road, which connected Asia and Europe for centuries in terms of trade and economic exchange, was a system of caravan routes stretching from China to the Mediterranean Sea. The geographical scope of the ancient Silk Road varied across different periods. However, as a result of historical processes, its boundaries gradually expanded. The peoples of Eurasia had the opportunity to become acquainted with numerous innovations through the Silk Road, and exchanges took place among them in many fields. In this regard, it would be inaccurate to consider the Great Silk Road merely as a trade route for silk. Not only merchants, but also travelers, diplomats, pilgrims, missionaries, and farmers traveled along the Silk Road, carrying their values from their countries of origin to new destinations (Koçak, 2019). Processes of exchange among different peoples took place in the countries located along the Silk Road. In addition to silk, various household items, works of art, and cultural elements were transported from the East to the West. In this respect, the Silk Road played a leading role in the lives of many peoples.

The Silk Road can be regarded as one of the earliest and most significant environments of globalization in human history. This ancient trade route resembles modern globalization, as people became acquainted with each other's cultures and established mutual relations through it. In this sense, it can be argued that one of the earliest processes of globalization in human history occurred precisely through Silk Road trade. In the modern era, projects such as the "One Belt, One Road" initiative have acquired new meaning and importance, particularly in terms of energy transit and regional geopolitical dynamics. Thus, the "One Belt, One Road" initiative proposed by China, the Southern Gas Corridor, as well as projects such as the Middle Corridor, have further intensified both competition and cooperation over energy and trade routes (Rice, 2023). In the modern era, the restoration of the Silk Road is taking shape at the intersection of various strategic interests. The safe transportation of energy resources, the diversification of trade routes, and the expansion of regional spheres of influence are the main directions of this process. In addition to energy-exporting countries such as Azerbaijan, Turkmenistan, and Kazakhstan, transit countries such as Georgia and Türkiye are also gaining strategic positions in Eurasian energy geography. At the same time, global powers such as China, the EU, and Russia are seeking to realize their geopolitical interests through infrastructure projects. Thus, the restoration of the historical Silk Road, particularly the Middle Corridor, can strengthen economic relations among Eurasian countries and contribute to ensuring energy security (Jannatov & Talibli, 2026).

In recent years, China's expanding engagement in Eurasia has increasingly extended to the South Caucasus, where industrial cooperation, logistics hubs, and infrastructure investments are becoming integral components of the evolving Silk Road framework (Niftiyev, 2022). This engagement facilitates the integration of smaller economies into global value chains, enabling them to move beyond transit functions toward value-added production and regional manufacturing networks. In a globalized economy, such processes enhance the strategic relevance of transit corridors such as

the Middle Corridor by linking energy routes, industrial zones, and cross-border supply chains. Moreover, regional geopolitical and geoeconomic organizations, particularly the Organization of Turkic States, play a growing role in coordinating energy security, transport connectivity, and policy harmonization among member states. The Organization of Turkic States thus contributes to the institutional consolidation of Eurasian energy and transit cooperation, reinforcing the resilience and sustainability of the Silk Road across the Turkic world (Niftiyev & Bagirzadeh, 2024).

This study examines the transformation of the historical Silk Road into a modern system of energy and transit corridors, with a particular focus on the Middle Corridor as a strategic axis of Eurasian connectivity. The main objective of the manuscript is to analyze the role of the Middle Corridor in facilitating energy transportation, trade flows, and regional integration across Eurasia. Specifically, the paper aims to identify the structural and geographical components of the Middle Corridor, assess its significance for energy transit and multimodal transport networks, and evaluate its strategic importance within contemporary initiatives such as the Belt and Road Initiative and regional cooperation frameworks. By addressing these objectives, the paper seeks to contribute to the academic debate on Eurasian connectivity and the evolving geopolitical and geoeconomic dynamics of modern Silk Road routes.

METHODS

The study is devoted to the restoration of the Historical Silk Road and its contemporary geopolitical significance in terms of energy, transit, and the regional balance of power. During the research process, a number of sources published in English and Turkish were used, including reports, scientific articles, monographs, statistical data, and thematic maps. In addition, official documents related to the “One Belt, One Road” initiative of the People’s Republic of China, the TRACECA program, the Southern Gas Corridor, and other transport and energy projects were also analyzed.

The methodological basis of the study is formed by historical-analytical and comparative analytical approaches. The historical-analytical method makes it possible to trace the processes of the emergence, decline, and restoration of the Silk Road at different historical stages. Comparative analysis is used to assess the geopolitical and economic impacts of various projects, such as the Middle Corridor, TRACECA, and the “One Belt, One Road” initiative. At the same time, the strategic position of the South Caucasus and Central Asia in terms of transit and energy logistics was examined through political-geographical analysis.

The geographical scope of the study includes China, the countries of Central Asia, the South Caucasus region (especially Azerbaijan and Georgia), Türkiye, and the member states of the European Union. During data collection, special attention was paid to the reliability of the sources. The collected materials were classified by thematic areas and systematized chronologically and spatially. The visualization of transport routes, energy pipelines, and regional connections was carried out using maps and geopolitical diagrams. This methodological approach made it possible to reveal

strategic connections between the historical and modern stages of the Silk Road and to identify new perspectives in terms of energy security and transit cooperation.

RESULTS

Initiatives for Reconstructing the Silk Road

By the end of the last century, geopolitical changes in the world promoted the restoration process of the Historical Silk Road, which had historically played a leading role in the economic development of nations and states along the trade routes. It is expedient to divide the restoration process of the historical Silk Road into the following two important stages.

In the first stage (1991–1998), the foundations for the restoration of the “Historic Silk Road” were established. Due to its nature, this stage was aimed at developing cooperation in the Black Sea and Caspian Sea basins and had a regional character. Thus, the TACIS (Technical Assistance to the Commonwealth of Independent States) and TRACECA (Transport Corridor Europe–Caucasus–Asia) programs were adopted in 1991–1993. TRACECA connects the strategic region of Central Asia with Europe and the broader international community (Yalçinkaya & Güzel, 2021). This is an international program of the European Union and was developed within the framework of TACIS. The TACIS programme is an EU initiative for the New Independent States that aims to foster the development of economic and political links between the EU and these partner countries (European Union, 2022).

The second stage was marked by the convening of an international conference to restore the historic Silk Road, held on September 7–8, 1998, in Baku, Azerbaijan, with the participation of the presidents of nine countries (Azerbaijan, Türkiye, Georgia, Ukraine, Moldova, Romania, Bulgaria, Uzbekistan, Kyrgyzstan), 13 international organizations, and delegations from 32 countries (The Official Website of the President of the Republic of Azerbaijan). The conference concluded with the signing of the Basic Multilateral Agreement and the Baku Declaration, which addressed the development of the Europe–Caucasus–Asia Corridor within the framework of the EU’s TRACECA programme. Last but not least, the Europe–Caucasus–Asia Corridor fosters the development of a new trade route. The project implemented during this period became more international than regional in scope. TRACECA also has a very important impact in terms of economic functions:

- To support the strengthening of the sovereignty of CIS countries in the TRACECA region and their economic independence in order to enable the effective integration of these countries’ economies into the world market;
- To increase investment from international financial institutions and private investment resources, which is vital for the countries of the region;
- To link the Eurasian transport corridor with Trans-European, and thus global, transport communications.

More recently, the initiatives put forward by China to restore the Historical Silk Road can be considered the third major stage in this process. Thus, the Chinese President announced his country’s

new development strategy during his visit to Kazakhstan in 2013. This concept, called the Silk Road Economic Belt, envisages close cooperation with neighboring states, as well as countries worldwide, in order to increase trade turnover and maintain peace and stability in international trade. In this sense, expectations for the New Silk Road are quite high.

Energy Security and New Perspectives

As can be seen, initiatives aimed at restoring the Historical Silk Road support East–West relations and encourage economic cooperation among countries. Furthermore, energy security has become one of the key issues in this context. The South Caucasus region plays a principal role both in the development of global cooperation and in ensuring energy security.

The collapse of the USSR opened a new chapter for the post-Soviet countries, particularly for the South Caucasus republics of Azerbaijan and Georgia, in developing mutual relations with the European Union. The Eastern Partnership has become a key instrument for integrating post-Soviet states into European cooperation frameworks. The EU inaugurated the Eastern Partnership by signing the “Prague Declaration” with six post-Soviet countries, including the South Caucasus republics of Azerbaijan and Georgia, on May 7, 2009 (Wojna & Gniazdowski, 2009). The EU offers free trade agreements and strategic partnerships to its eastern neighbors in order to promote regional stability. The expansion of these relations has also accelerated the process of building a new Silk Road.

The issue of energy security increases the strategic importance of the South Caucasus region. As Azerbaijan is the most strategically significant country in the South Caucasus due to its oil and gas resources, its prospects have increased considerably. From this perspective, EU–Azerbaijan economic cooperation is closely linked to energy security. Alongside economic development, the implementation of the Baku–Tbilisi–Ceyhan Pipeline contributed to rapid growth in Azerbaijan. On September 20, 1994, the “Contract of the Century” was signed by eight countries and 13 international companies (Çelikpala & Veliyev, 2015). This policy for the development of the oil and gas sector involved foreign investors and international corporations, thereby increasing international interest in the country. At the 2011 Baku meeting, Azerbaijani President Ilham Aliyev and the former President of the European Commission, José Manuel Barroso, signed a Joint Declaration on the Southern Gas Corridor (SGC) to bring Caspian, Central Asian, and Middle Eastern gas resources to the European market (Socor, 2014a). Georgia and Türkiye, which play intermediary roles in transporting Azerbaijani gas to Europe, are major partner countries in this cooperation. Figure 1 shows the strategic map of the Southern Gas Corridor and its partner states.

The Southern Gas Corridor connects three pipeline projects—the South Caucasus Pipeline (SCP), the Trans-Anatolian Natural Gas Pipeline (TANAP), and the Trans Adriatic Pipeline (TAP)—and supports mutual relations among the EU, Azerbaijan, Georgia, and Türkiye (Socor, 2014b). The Shah Deniz II Development Plan, as a key component of this major project, has created more favorable

opportunities for Azerbaijan–EU energy cooperation. The Southern Gas Corridor also opens new perspectives for the development of the Europe–Caucasus–Asia Economic Corridor.

Figure 1. Southern Gas Corridor



Source: Southern Gas Corridor, <https://www.sgc.az/en>

Belt and Road Initiative and Expectations from the New Economic Corridor

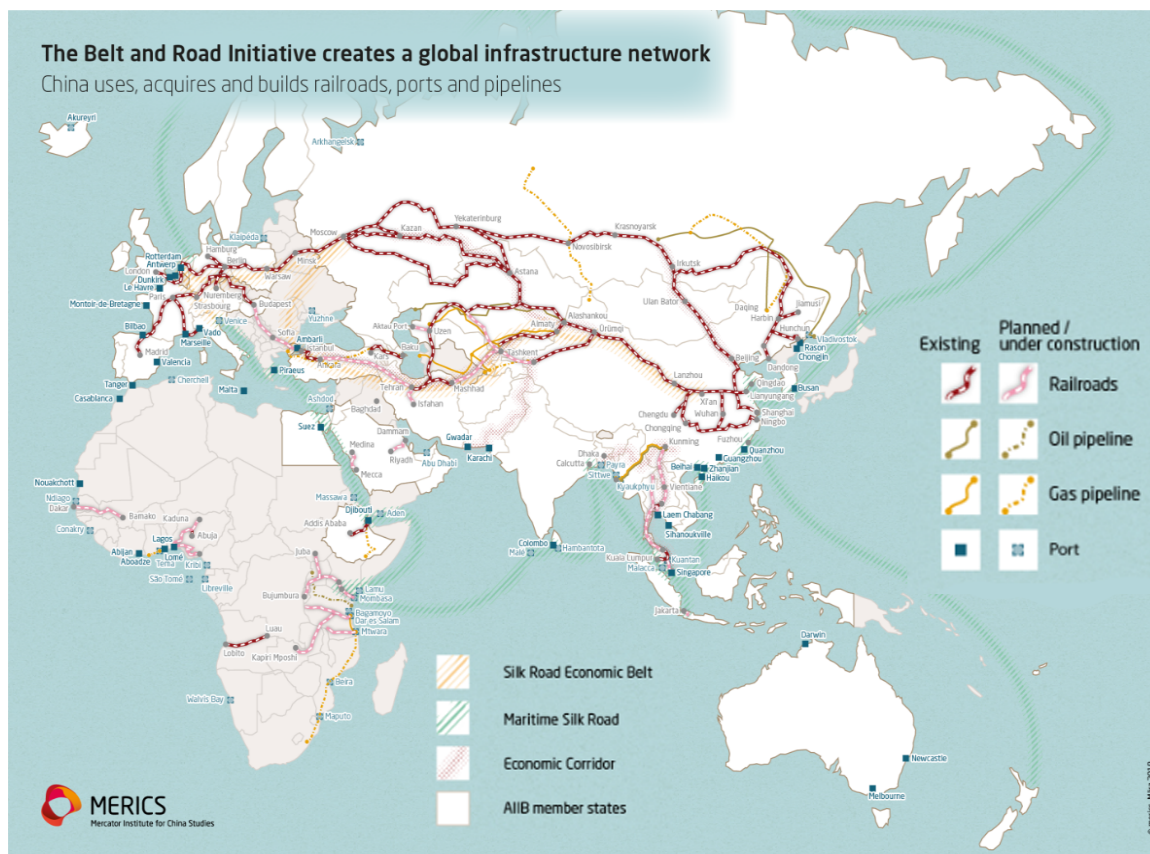
Since the 2000s, China's economy has expanded significantly and the country has become one of the key players in the Asian region (Doğan, 2020). This rapid growth prompted China to revitalize the historic Silk Road in order to ensure its competitiveness in world trade. The "Belt and Road Initiative" (BRI), formerly known as "One Belt, One Road," was adopted by China as a development strategy in 2013. Chinese President Xi Jinping announced this strategy as the "Silk Road Economic Belt" during his official visit to Kazakhstan in September 2013 (Rice, 2023). The Chinese government's Belt and Road Initiative plans to invest in nearly 150 countries and organizations, including those in Central Asia and the South Caucasus. One month later, during his visit to Indonesia, the Chinese leader also proposed the construction of the "Twenty-First Century Maritime Silk Road" in order to enhance economic cooperation with Southeast Asian countries (Zhao, 2015).

The Belt and Road Initiative represents a significant opportunity to enhance mutual benefits and cooperation among countries located along the Silk Road. The strategy envisages two main directions of development: the Silk Road Economic Belt and the Maritime Silk Road (Gülez, 2022). Its primary objective is to create a trade corridor that enables the direct transportation of goods from East to West under favorable conditions. Figure 2 illustrates the Silk Road Economic Belt and the Maritime Silk Road.

The Belt and Road Initiative is a New Silk Road project that promotes global cooperation. This cooperation, in economic terms, has significant potential to stimulate economic vitality and to create substantial opportunities and benefits. The major objective of the BRI is to construct a unified market and to make use of both international and domestic markets by fostering cultural exchange among

participating countries. From this perspective, the Chinese government is interested in involving numerous actors in this large-scale project. The realization of this initiative may result in a sharp increase in new employment opportunities, foreign investment, productivity, as well as in the development of science and technology in the countries that join the Silk Road.

Figure 2. Silk Road Economic Belt and the Maritime Silk Road.



Source: Mercator Institute for China Studies, "Mapping the Belt and Road initiative: this is where we stand", <https://merics.org/en/tracker/mapping-belt-and-road-initiative-where-we-stand>

There is no doubt that China is currently the country most interested in the restoration and development of the Silk Road. However, Central Asia and the Caspian basins constitute the main geographical areas of the New Silk Road. In particular, the South Caucasus region is considered one of the key routes of the Belt and Road Initiative (Hongjun, 2020). Considering that Azerbaijan is a leading country in the South Caucasus region, it can be regarded as one of the strategic powers within the China–Central Asia–West Asia economic corridor. Within this initiative, the governments of the Republic of Azerbaijan and the People’s Republic of China signed a memorandum of understanding on the joint promotion of the establishment of the Silk Road Economic Belt in December 2015 (Babayev & Ismailzade, 2020).

As a result of the long-standing friendly relations between the peoples of China and Azerbaijan, Azerbaijan became the first country in the Caucasus region to support China’s “One Belt, One Road” initiative. The increasing geopolitical importance of the Middle Corridor connecting China and Europe

has led to growing Chinese interest in the South Caucasus region and to the further development of its strategic partnership with Azerbaijan. The strategic partnership between Azerbaijan and China was further strengthened with the signing of the “Joint Declaration of the Republic of Azerbaijan and the People’s Republic of China on the Establishment of a Strategic Partnership” at the 2024 Shanghai Cooperation Organization Summit in Astana (Fazl-e-Haider, 2025).

From this point of view, Azerbaijan plays the role of a logistics center, hub, and bridge in the implementation of the “One Belt, One Road” strategy. The Baku–Tbilisi–Kars Railway, connecting Azerbaijan, Georgia, and Türkiye, is the largest and most successful project in the Silk Road restoration process implemented by the Republic of Azerbaijan. The Baku–Tbilisi–Kars railway plays a crucial role in the transportation of goods and people (Scotti et al., 2024). The Azerbaijani government also plays an active role in the development of the North–South Transport Corridor. The integration of these two projects—the Baku–Tbilisi–Kars Railway and the North–South Transport Corridor—will benefit China, Central Asian countries, South Caucasus republics (Azerbaijan and Georgia), Türkiye, and Europe. These large-scale projects enhance the strategic role of the South Caucasus region in the newly restored Silk Road. The South Caucasus region may take a leading role in the new Silk Road connecting East and West. In particular, the Russian–Ukrainian crisis has increased the role of the South Caucasus region in both the restoration of the Silk Road and the provision of Europe’s energy security. Figure 3 indicates that the Middle Corridor—railways of Kazakhstan, Azerbaijan, Georgia, and Türkiye—creates more options for transit from China to Europe.

Figure 3. Middle Corridor – Railways of Kazakhstan, Azerbaijan, Georgia and Türkiye.

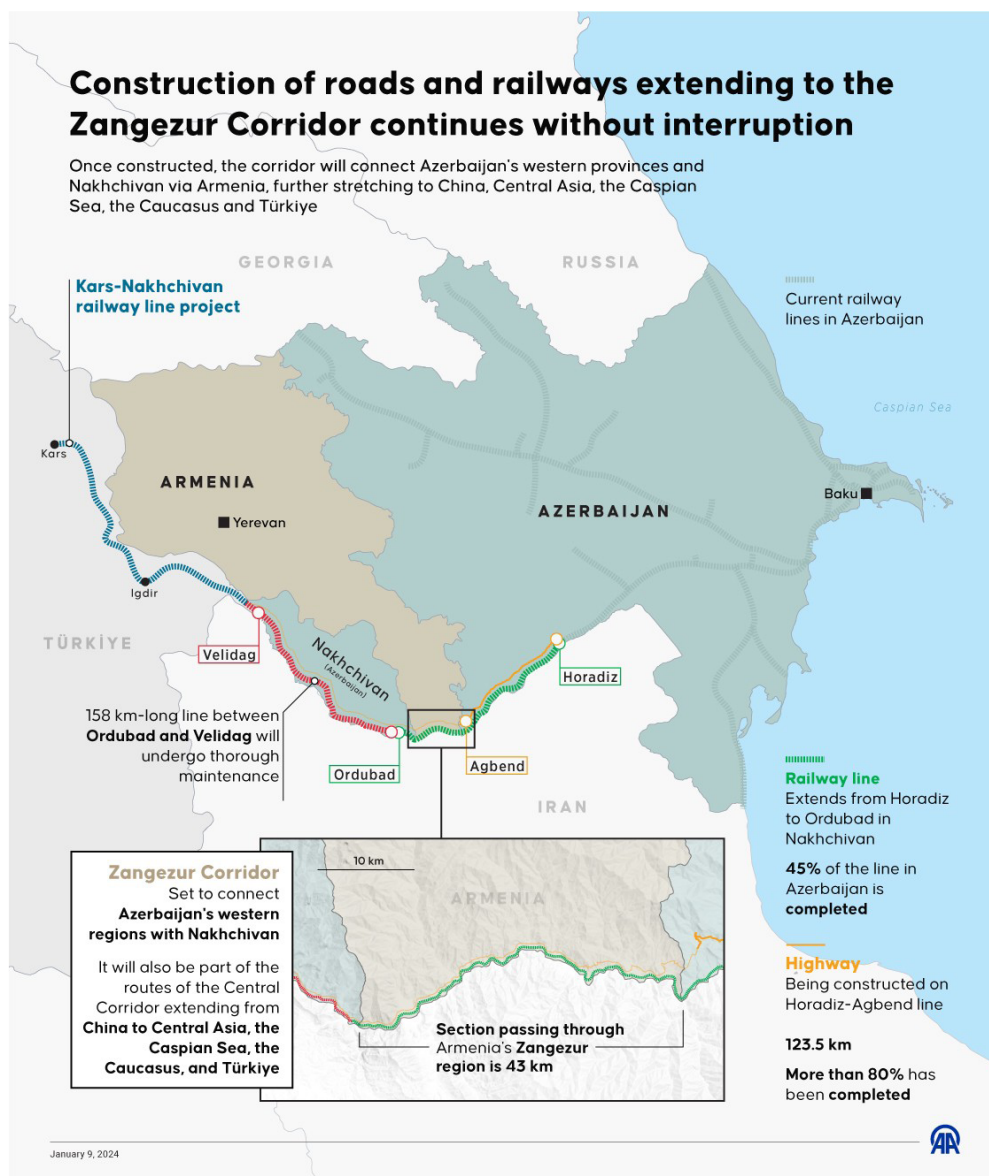


Source: Railways of Georgia, Azerbaijan, Türkiye and Kazakhstan will create a joint venture “Middle Corridor”,

The post-war period has opened a new phase in Azerbaijan–Armenia relations, creating a potential framework for normalization and long-term peace in the South Caucasus. Sustained diplomatic efforts contribute to regional stability, which is a critical prerequisite for the development of transnational transport and energy corridors. In this context, the proposed Zangezur Corridor represents a strategic link that could enhance connectivity between Azerbaijan and its exclave, Nakhchivan,

while simultaneously strengthening East–West and North–South transit routes (Rehimov, 2024). The realization of the Zangezur Corridor is expected to further strengthen the Middle Corridor by reducing transportation time, diversifying logistics routes, and increasing the overall resilience of Eurasian supply chains. Moreover, it would integrate the South Caucasus more effectively into global value chains by connecting Central Asia, the Caspian region, and Europe (Aguiar, 2025). From a broader geopolitical perspective, the corridor has the potential to transform the South Caucasus from a zone of competition into a platform for cooperation and economic interdependence. Consequently, the successful implementation of post-conflict infrastructure initiatives would further consolidate Azerbaijan’s role as a key transit and energy hub within the Middle Corridor framework. Figure 4 shows the importance of the Zangezur Corridor for the South Caucasus region as well as the Middle Corridor.

Figure 4. Zangezur Corridor: Construction of Roads and Railways.



Source: Rehimov, R. (2024, January 09)

CONCLUSIONS

As can be seen, the restoration of the Silk Road in the 21st century is not merely an economic project but also a manifestation of a new global order, in which connectivity, mutual dependence, and sustainable development have become central elements of international cooperation. It fosters intercultural dialogue and enhances regional resilience against global challenges such as economic crises, political instability, and climate change. Therefore, the New Silk Road should be regarded as a multidimensional initiative that unites nations not only through infrastructure but also through shared values of peace and collaboration.

The major issue affecting transport and, consequently, the future development of the New Silk Road—also known as “One Belt, One Road”—is the growing trade flow between Europe and Asia. In order to understand the economic significance of the European Union and China at both the regional and global levels, it is crucial to examine the impact of the New Silk Road initiative on their future trade trends. The New Silk Road will further strengthen economic relations among partner countries and facilitate the transportation of goods.

Considering the issue of energy security, the South Caucasus region may play a decisive role in the newly restored Silk Road. The fact that Iran’s economy remains under embargo and, following the Russia–Ukraine crisis, the decline of Russia’s status as a reliable transit route has turned the South Caucasus region—especially Azerbaijan—into a leading transit area within the Belt and Road project from China to Europe. All countries joining the New Silk Road will benefit economically. Thus, like the Historical Silk Road, the New Silk Road will play an important role as a means of exchange in trade, science, and culture among peoples and countries.

The Middle Corridor represents a multimodal transport route linking China to Europe through Central Asia, the Caspian Sea, the South Caucasus, and Türkiye. The corridor integrates rail, maritime, and pipeline infrastructure, connecting key transit nodes such as Kazakhstan, Azerbaijan, Georgia, and Türkiye. Its strategic position enables the transportation of energy resources and goods while reducing transit distance and delivery time compared to traditional northern routes. In this context, the Middle Corridor functions as a complementary and increasingly utilized pathway within the broader Eurasian transport and energy network.

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Geopolitical Risk and Renewable Energy: The Role of Green Bonds

ABSTRACT

Green bonds are financial instruments that enable the analysis of the impacts of geopolitical turbulence on investments in renewable energy. This study aimed to explore the relationship between these factors, considering the geopolitical risk index developed by Caldara and Iacoviello. Through a PRISMA review, four central themes were identified: hedging strategies, asset/portfolio diversification, volatility dynamics/transmission, and the energy transition. Many of the articles addressed more than one theme. However, the most and least frequently addressed topics were asset/portfolio diversification and the energy transition, respectively. The association between geopolitical risk, green bonds, and renewable energy was divided into three categories: risk management, sustainable development, and market positioning. The results of this study are relevant in two respects. First, there is a shortage of research focusing on the theme presented in this article. Second, the present study fills a gap identified in the literature while contributing to a better understanding of the impact of geopolitical risk on an instrument that operates in the context of the energy transition, climate change, and sustainable development.

Keywords: geopolitical risk, green bonds, PRISMA, renewable energy

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INTRODUCTION

There is no consensus in the literature on the definition of geopolitical risk (GPR). However, this study adopts the definition provided by Caldara and Iacoviello (2018a, 2022b). According to the authors, geopolitical risk refers to the risk associated with wars, terrorist acts, and tensions among states that affect the normal course of international relations. The geopolitical events considered include conflicts and acts that generate spillovers beyond a nation's borders. These conflicts are associated with territorial disputes that can involve corporations, rebel groups, political parties, and other actors. Historical and institutional contexts play a key role in the materialisation or escalation of such events, which often affect neighbouring countries and regions and, at times, have global repercussions. Drawing on this definition, Dario Caldara and Matteo Iacoviello developed an index that has been widely adopted in the literature.

The index was constructed based on publications from 11 newspapers: *The Boston Globe*, *The Chicago Tribune*, *The Daily Telegraph*, *The Financial Times*, *The Globe and Mail*, *The Guardian*, *The Los Angeles Times*, *The New York Times*, *The Times*, *The Wall Street Journal*, and *The Washington Post*. The GPR index data are available monthly and daily, with sub-indexes named “geopolitical threat” and “geopolitical act.” Among the available options are historical versions, recent versions, and country-specific versions (Caldara & Iacoviello, 2022). Although the article presenting the index was first published in 2018, databases such as Web of Science and Scopus display only the 2022 version. In both databases, the article has more than 1,000 citations, which demonstrates the strong interest of other researchers.

The interdisciplinary nature of geopolitical risk enables the index to be applied across various fields of knowledge. However, areas related to energy receive considerable attention. A body of literature examines the connection between wars, territorial disputes, and energy commodities. According to Yu et al. (2023), the scarcity of these resources is not the only driving force behind conflicts; their abundance can also play a role. Oil, popularly known as “black gold,” can be highlighted as a driver of wars, strategies, and alliances between countries throughout history (Patidar et al., 2024). Despite the strong relationship between fossil fuels and geopolitical disputes, attention is also given to other types of energy sources. According to Brutsching and Fleig (2018), periods of geopolitical turbulence give alternative energy sources a central role, especially with regard to the investments of oil net-importing countries. Renewable energy sources are among these alternatives.

The International Energy Agency (IEA) defines renewable energy as “all forms of energy produced from renewable sources in a sustainable manner, including bioenergy, geothermal energy, hydro-power, ocean energy, solar energy, and wind energy” (IEA, 2022a). The geopolitics of renewables, often referred to as the geopolitics of the energy transition, provides insight into the positioning of certain countries within a global context characterised by the increasing prominence of renewable energy (Hafner & Tagliapietra, 2020). The age of fossil fuels is coming to an end, not because of the supply or availability of these resources, but because of their impacts on the atmosphere (Blondeel et

al., 2021; Hafner & Tagliapietra, 2020). The rise in Earth's temperature, as well as its implications, was discussed for the first time during the First Earth Summit in 1972 organised by the U.N. (United Nations) (U.N., 2007). Subsequently, the Kyoto Protocol (1997), the Paris Agreement (2015), and the adoption of the Sustainable Development Goals (SDGs) highlighted, at the international level, the relevance of climate and environmental issues.

Regarding the efforts made by governments, institutions, and other actors to combat climate change, investment in renewable energy has become one of the main tools. The Green Deal launched by the European Union (EU) in 2019 is an example illustrating the scale of efforts focusing on climate issues. The initiative aims to allocate around 1 trillion euros in sustainable finance for decarbonisation and the promotion of renewable energy production and adoption (EU, 2025). Initiatives focusing on the energy transition have also been observed in Japan through the GX (Green Transformation) strategy (Climate Bonds Initiative [CBI], 2025). Regardless of the specific plan, it is apparent that among the most widely implemented financial mechanisms are regulated carbon markets and green bonds (GB).

Green bonds (GB) are debt instruments used to finance or refinance new or existing sustainable projects. These bonds adhere to the guidelines of the Green Bond Principles (GBP), established by the International Capital Market Association (ICMA, 2025), which include objectives such as climate change mitigation, conservation of natural resources, and the prevention and control of pollution, among others. The first green bond was issued in 2007 by the European Investment Bank (EIB), followed by the World Bank, whose issuance was finalised in November 2008 (Cheong & Choi, 2020). Since then, the green bond market has grown rapidly and, in 2024, reached an issuance amount of around half a trillion dollars for the fourth consecutive year (CBI, 2025). These instruments affect the three dimensions of sustainability. However, the energy sector receives the most attention compared with other sectors (CBI, 2024).

The relationship between geopolitics and the energy sector has been explored in the literature mostly in contexts marked by geopolitical turbulence. Aishwarya and Muthumeenakshi (2024) conducted a bibliometric analysis and a PRISMA systematic review to identify research trends concerning geopolitical risk, finance, and relevant macroeconomic variables. The results indicated a concentration of the literature on the spillovers and volatility generated by GPR in oil markets, stock markets, renewable energy, bitcoin, and commodities. The predominance in the literature on GPR of topics related to oil has also been identified by Tamilselvan et al. (2024). The authors broaden Caldara and Iacoviello's definition to include events such as trade wars, man-made disasters, and conflicts between regional organisations, among others. Their bibliometric analysis indicated that the relationship between GPR and energy (oil and gas) is the most frequently studied topic.

Yu et al. (2023) conducted a bibliometric analysis of the governance of natural resources and geopolitical risk. The authors identified that prior to 2015, the literature focused on the relationship between natural resources and geopolitical risk. After 2015, attention shifted to the relationship between geopolitical risk and the governance of natural resources. The number of studies related to geopolitical risk has increased, not only with regard to the governance of these resources but also in areas connected to Sustainable Development (SD) (Wang et al., 2024). Wang et al. (2024) identified

a growing interest in this theme after 2019. In this strand of literature, some of the prominent topics include business development, food security, the energy sector, and global supply chains (GSC).

The relationship between geopolitics and GSC is also considered by Pandey and Kumar (2025), except that the focus is on the Indian energy transition. Given that renewable energy production requires specific inputs, the relationship between geopolitical turmoil and supply chain disruptions is highly relevant for countries that import these materials. Rare earths, copper, lithium, cobalt, and nickel have gained prominence because of their importance in green energy production, but their supply and processing are geographically concentrated (IEA, 2022b). Geopolitical turbulence has the potential to endanger and hinder the shift from a fossil-fuel-intensive system to a material-intensive one by disrupting global supply chains. Focusing on the impact of the energy transition, Vakulchuk et al. (2020) reviewed the literature on geopolitics and renewable energy. The authors identified five main themes. Among them are critical materials, cybersecurity, and the potential winners and losers of the energy transition.

Fossil-fuel-rich countries such as Russia, Venezuela, Saudi Arabia, and Iran are often depicted as losers in the energy transition. The worldwide adoption of renewable energy will likely promote a shift in global power dynamics, since these dynamics have long been influenced by dependence on and national control of fossil fuels (Hafner & Tagliapietra, 2020). A potential scenario in which countries have their oil, gas, or coal reserves stranded would have a direct economic impact and, consequently, lead to a geopolitical reshuffle. This reshuffle could be associated with a reduction in dependence on fossil fuels and an intensified search for critical materials (Wang et al., 2023). Countries such as Iceland and the Democratic Republic of Congo are perceived as winners given their territorial endowment of critical materials (Hafner & Tagliapietra, 2020; Vakulchuk et al., 2020). Regarding China and India, two major players in the global economy, there is no consensus on the position they occupy in this dynamic. However, some authors perceive them as winners given that they are not rich in fossil fuels and are rapidly adopting renewable energy (Hafner & Tagliapietra, 2020; Hassan et al., 2024). The same line of interpretation is observed in analyses of some EU countries (Hafner & Tagliapietra, 2020; Hassan et al., 2024; Makarov & Smolovic, 2026).

Geopolitical exposure to conflicts, access to alternative energy sources, as well as the historical and institutional context of a nation are of utmost relevance, as they are connected to a country's ability to foster renewable energy investment. Regulatory policies, the commitment to raising environmental awareness, improvements in infrastructure, and standardisation are among the factors that can promote green investment (Deschryver & Mariz, 2020). These measures often reflect a solid institutional framework, an advantage that nations frequently drawn into military conflicts and economies that are still developing may lack (Lisbinski & Burnquist, 2024; Rizvi & Véganzonès-Varoudakis, 2023).

However, the abundance of natural resources is perceived as a form of leverage. Brazil is one of the nations that does not display a robust institutional framework but has low geopolitical exposure to conflicts and wide access to alternative sources of energy. For these reasons, there is no consensus on the position that Brazil occupies as either a winner or a loser in the energy transition. Despite its

institutional fragility and fossil fuel reserves, the country has significant biofuel production and one of the cleanest energy matrices in the world (Hafner & Tagliapietra, 2020; Vega et al., 2024).

The intersection between GPR, renewable energy, and green finance encompasses all the aspects mentioned above, as it acknowledges geographical, cultural, and institutional characteristics. Understanding how these variables interact contributes to the advancement of humanitarian causes without neglecting the intrinsic attributes of the geopolitical landscape.

Despite the existence of bibliometric studies and systematic reviews on geopolitics, geopolitical risk, and their influence on renewable energy, studies focusing on the role of green bonds were not found. Most of the literature analyses the influence of geopolitics on renewable energy from a broader perspective without accounting for specific mediating mechanisms. Therefore, the present article fills a gap identified in the literature while contributing to the understanding of the impact of geopolitical risk on a financial mechanism that influences the energy transition, climate change, and sustainable development.

The objective of this article is to explore the relationship between geopolitical risk (GPR) and renewable energy while considering the role of green bonds, specifically the manner in which these factors are related and influence each other. To attain these objectives, a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) systematic literature review was conducted. The present article follows the PRISMA version employed by Pandey and Kumar (2025).

METHODS

Applying PRISMA in Systematic Literature Reviews

Literature reviews constitute the foundation on which academic research is built. However, exploring existing knowledge on a specific topic can be complex given the acceleration of scientific production. This factor may influence the quality and scope of reviews (Snyder, 2019). Many research articles include sections of bibliographic review that seek to support their discussions. Nevertheless, when applied as a methodology, reviews can assume different formats.

A systematic review is a research method that critically identifies and presents data from previous research on a specific topic (Liberatti et al., 2009). It is more meticulous than a simple theoretical background because it follows protocol-based eligibility criteria (Sharif et al., 2019). Systematic reviews can take different forms, but this study adopts the PRISMA format. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis) is a set of guidelines created to improve the reporting of systematic reviews (PRISMA, 2020). It was originally designed for the healthcare field but has also been applied in other areas of knowledge.

Pahlevan-Sharif et al. (2019) applied PRISMA to explore systematic reviews in the tourism and hospitality literature. López et al. (2025) employed the PRISMA format in a content analysis focusing on the influence of geopolitics on supply chain disruptions. Aishwarya and Muthumeenakshi (2024)

conducted a bibliometric analysis and a PRISMA systematic review to identify research trends related to geopolitical risk in finance. Finally, Pandey and Kumar (2025) applied PRISMA to explore the literature concerning the risks associated with the gradual coal down-phase in India.

Among the studies mentioned, there are qualitative reviews (Pandey & Kumar, 2025) and mixed-approach reviews that employed automation tools to assess the quality of the studies (López et al., 2025). The reviews that did not use such tools were rigorous in selecting databases, relying on their indexing standards to ensure data quality.

Search Protocol for Systematic Review

The searches were conducted between April 15 and June 4 in Scopus (Elsevier) and Web of Science (WOS). Initially, different keyword combinations were tested. The final combination included the following terms: (“geopolitical risk” OR “geopolitical threat” OR “geopolitical act” OR “GPR index”) AND (“renewable energy” OR “clean energy” OR “energy transition” OR “energy security”) AND (“green bonds” OR “green finance”). The term “GPR index” refers to the geopolitical risk index, and its inclusion relates to this article’s objective of analysing works that utilised the index constructed by Caldara and Iacoviello.

After the keyword search, all works citing the index were selected. This approach ensured that studies adopting the authors’ definition of GPR were considered. Subsequently, the data concerning the authors, title, and abstract of each article were added to an Excel sheet for the application of the eligibility criteria.

Eligibility Criteria for Study Selection

The process of gathering and selecting the studies followed the criteria below:

1. Publication period: Works not published between 2018 and 2025 were excluded. This criterion reflects the fact that the first version of the index was published in 2018. Although the databases only include the 2022 version, this period was considered based on the assumption that some indexed articles could contain the first version of the index.
2. Publication type: Only research articles were considered. Therefore, book chapters and review articles were excluded.
3. Language: Only articles published in English were considered.
4. Usage of the GPR index: There are other GPR indices in the literature. However, this review adopts the definition proposed by Caldara and Iacoviello. Consequently, studies that did not use the authors’ index were excluded.

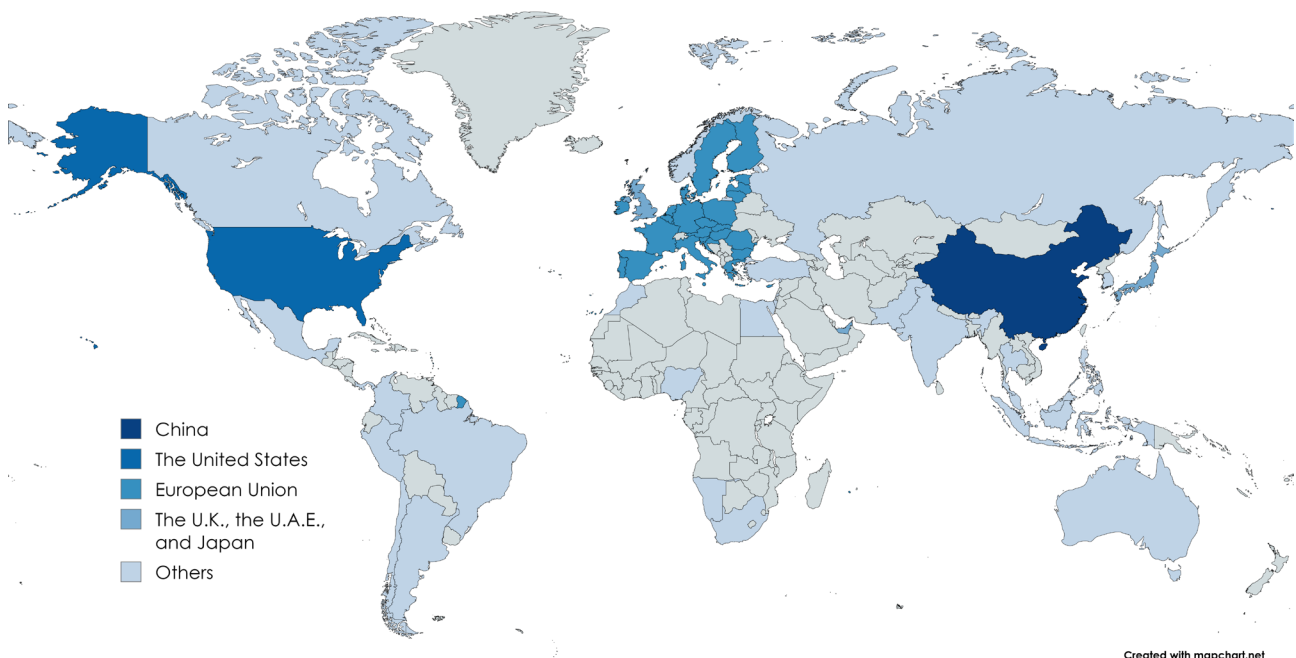
During the evaluation phase, the titles and abstracts were analysed to identify which works incorporated the three variables relevant to this review. Works that did not consider renewable energy, green bonds,

and Caldara and Iacoviello's GPR index were excluded. The remaining articles were included in the systematic review. Finally, categories were created to organise the relationships identified between green bonds, GPR, and renewable energy. The criteria used in the categorisation were the main themes discussed in each article.

RESULTS

Forty-eight articles were included in the analysis. Some of the articles focused on specific countries, while others analysed broader regions. The geographical focus of the studies is displayed in Figure 1.

Figure 1. Geographical Distribution of the Studies Included in the Systematic Review

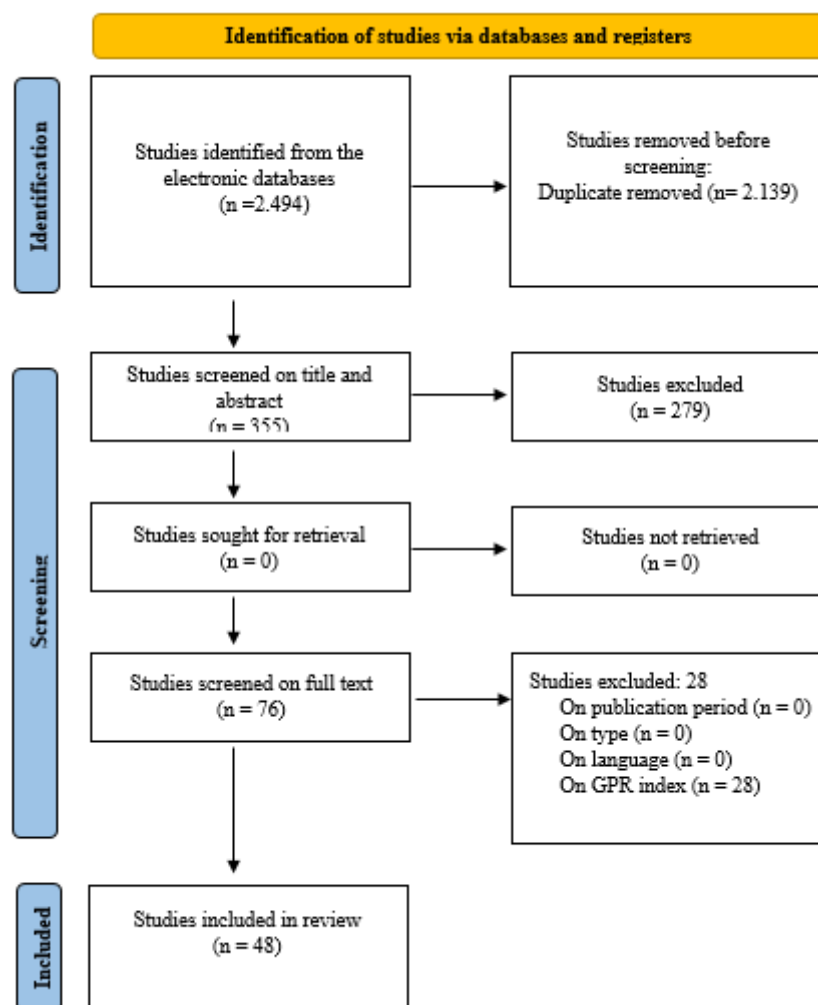


Source: Elaborated by the authors

China, the U.S., and the EU represent the three most frequently analysed locations, in that order. The U.K., the U.A.E., and Japan were also examined in several studies. The category “Others” refers to studies that used a broad global sample, including countries such as Australia, Canada, Russia, Brazil, India, and South Africa, among others. All of the studies employed quantitative methods, as they used the geopolitical risk index in their analyses. Although the first version of the index was released in 2018, all the works that met the selection criteria were published between 2021 and 2025. Figure 2 presents the results corresponding to the identification, screening, and inclusion phases.

The core themes approached by the articles were identified, even though many studies included more than one theme. Table 1 and Figure 3 present the categories referring to the identified themes.

Figure 2. Results of Search and Screening Process (in PRISMA format)



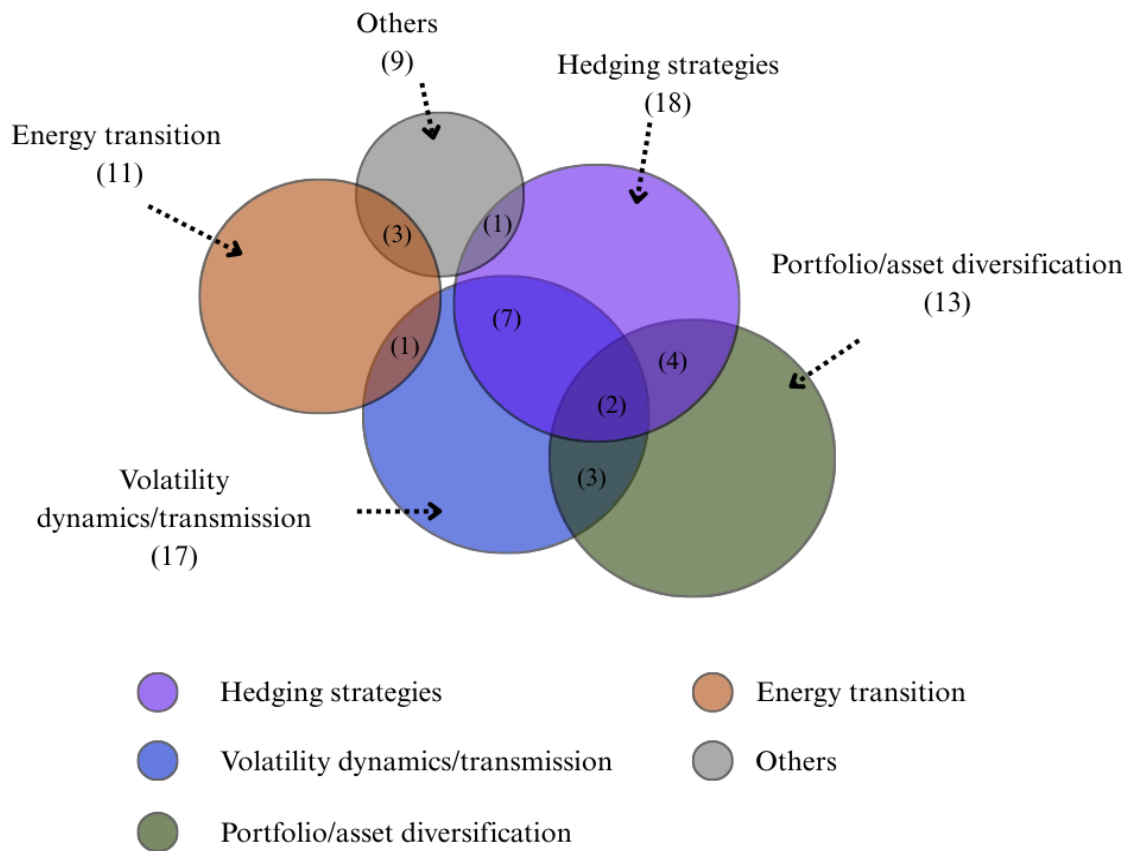
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Table 1. Identified Themes

Core themes	n° of articles
Hedging strategies	18
Volatility dynamics/transmission	17
Asset/portfolio diversification	13
Energy transition	11
Others	9

Core themes	Hedging strategies	Volatility dynamics/ transmission	Asset/portfolio diversification	Energy Transition	Others
Hedging strategies	18	7	4	0	1
Volatility dynamics/transmission	7	17	3	1	0
Asset/portfolio diversification	4	3	13	0	0
Energy transition	0	1	0	11	3
Others	1	0	0	3	9

Figure 3. Identified Themes



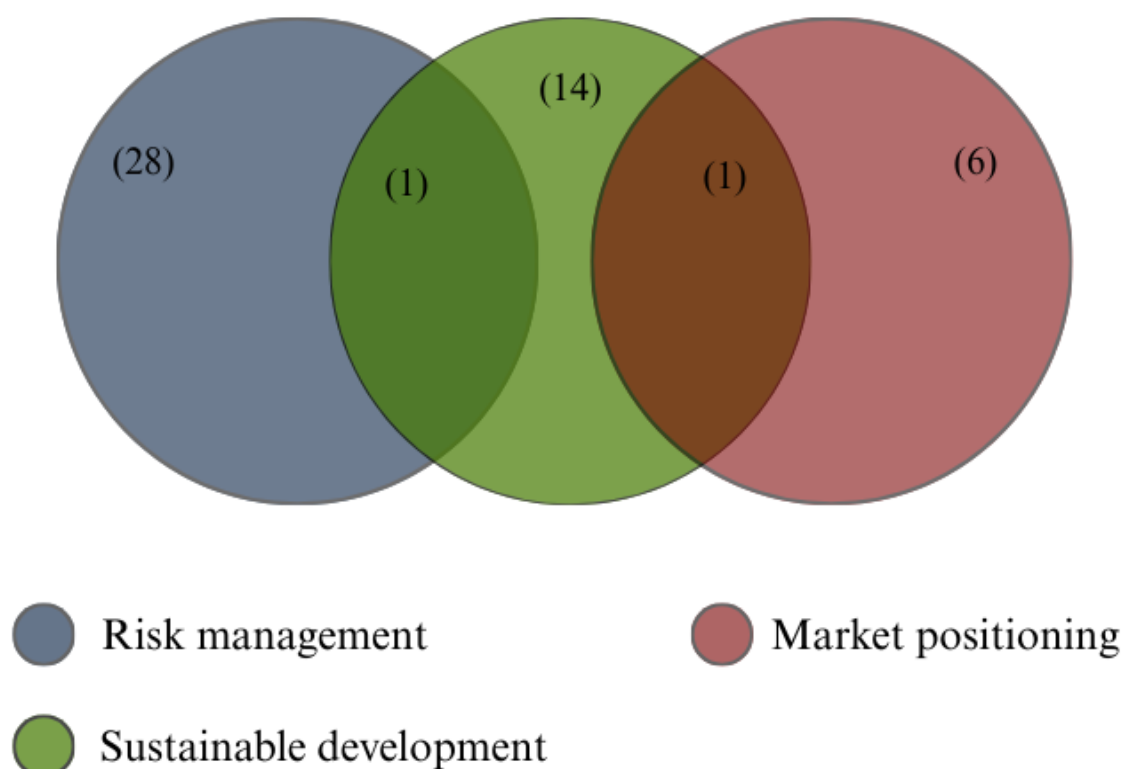
Source: Elaborated by the authors

The most recurrent theme was “hedging strategy,” while the least recurrent was “energy transition.” Themes that were not frequently discussed were grouped under the category “Others.” This category includes topics such as climate change, the environment, and capital flows. Most of the studies did not include a theoretical framework, although some articles presented well-established theories to introduce and discuss the themes. This article aims to comprehend the relationship between geopolitical risk, green bonds, and renewable energy. Consequently, the study focuses on identifying how the literature combines these three factors. Table 2 and Figure 4 present the identified relationships.

Table 2. Identified Relationships

Identified categories	n° of articles
Risk management	28
Sustainable development	14
Market positioning	6

Figure 4. Identified Relationships



Source: Elaborated by the authors

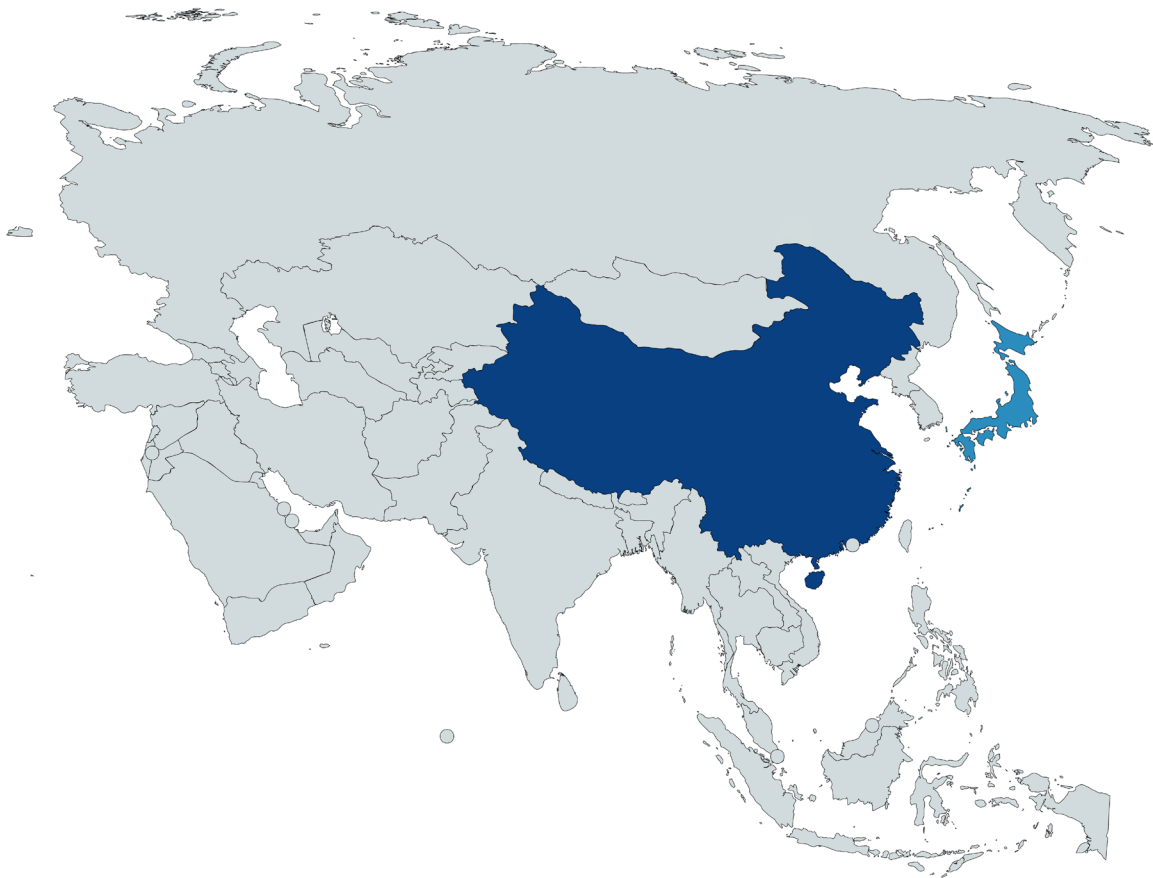
The results revealed three types of relationships: “market positioning,” “risk management,” and “sustainable development.” In some cases, these relationships were examined simultaneously within the same analysis. The frequency of each identified relationship is presented in Table 2.

The three relationships illustrate how geopolitical risk, green bonds, and renewable energy interact. In some relationships, all elements are associated, whereas in others only two of the variables appear to be connected. “Market positioning” is a relationship that does not associate all three variables. Nevertheless, the connection between geopolitical risk, green bonds, and renewable energy is present in the “risk management” and “sustainable development” relationships.

There are different versions of the GPR index. The database developed by Caldara and Iacoviello contains both global and country-specific versions of the index. Most articles utilised the global version; however, some studies employed country-specific indices to evaluate Asian countries. Figure 5 shows the country-level use of the GPR index.

China was the most frequently analysed nation, followed by Japan. Many studies had a specific geographical focus, as shown in Figure 1. However, the majority employed the global version of the GPR index in their analyses. The data extracted from the review are presented in Appendix A.

Figure 5. Country-Specific GPR Indices Used in the Literature



Source: Elaborated by the authors

Market Positioning

The market positioning of companies focuses on corporate investments and ESG conduct. Several articles applied signalling theory, rooted in neoclassical thought, as the basis for their analysis. This theory is based on the existence of information asymmetry and was initially developed considering only two parties. Differences in the level of information enable only one party involved in a transaction to be fully aware of certain factors. The informed party must decide which signals to send, and the receiving party must interpret them (Connely et al., 2011). Market signalling aims to influence agents' perceptions regarding the quality or reputation of an organisation (Wang et al., 2025).

Therefore, investing in sustainable finance can be perceived as a strategy used by organisations to signal their concern for climate issues to stakeholders, contributing to the formation of reputational capital (Wang et al., 2025). Certain articles argued that companies use signals to communicate their commitment to sustainability through Corporate Social Responsibility (CSR), ESG conduct, or green bond investment (Fiorillo et al., 2024; Lian & Hou, 2024; Mertzanis & Tebourbi, 2025; Mohammed et al., 2024).

This literature primarily focused on the primary green bond market. Costs, prices, and bond yields were the main aspects examined. Benefits such as the “greenium,” referring to the issuance of green bonds at a negative premium, are explored by Fiorillo et al. (2024), Lian and Hou (2024), and Mertzanis (2025). This advantage allows companies to issue bonds at a higher price and consequently a lower yield. These conditions are made possible by investors’ willingness to accept lower yields in exchange for funding projects with a higher purpose, namely sustainability. This cost advantage is observed in the primary market when compared with conventional bonds. Results are heterogeneous for the secondary market; when positive, the margin is narrow (Fiorillo et al., 2024; Lian & Hou, 2024).

Beyond greenium, the influence of foreign direct investment, monetary policy, digital transformation, and climate change on green bond issuance has also been examined (Christnacht & Mertzanis, 2025; Guesmi et al., 2025; Mertzanis et al., 2025).

Geopolitical risk was presented in the studies as a factor that could either promote or discourage green bond issuance. However, most studies identified positive impacts of GPR on the issuance of these bonds. Mertzanis and Tebourbi (2024) concluded that both geopolitical acts and threats are positively correlated with green bond issuance, although the effect is neither immediate nor linear. Positive results regarding the influence of geopolitical risk on GB issuance were also reported by Christnacht and Mertzanis (2025), Houcine and Mertzanis (2025), Fiorillo et al. (2024), and Lian and Hou (2024). None of the studies detected negative impacts of GPR on GB issuance. Mertzanis et al. (2025) did not identify a significant influence of geopolitical risk on green bond issuance; however, their focus was on the impact of digital transformation on GB issuance rather than the direct relationship between GPR and GB.

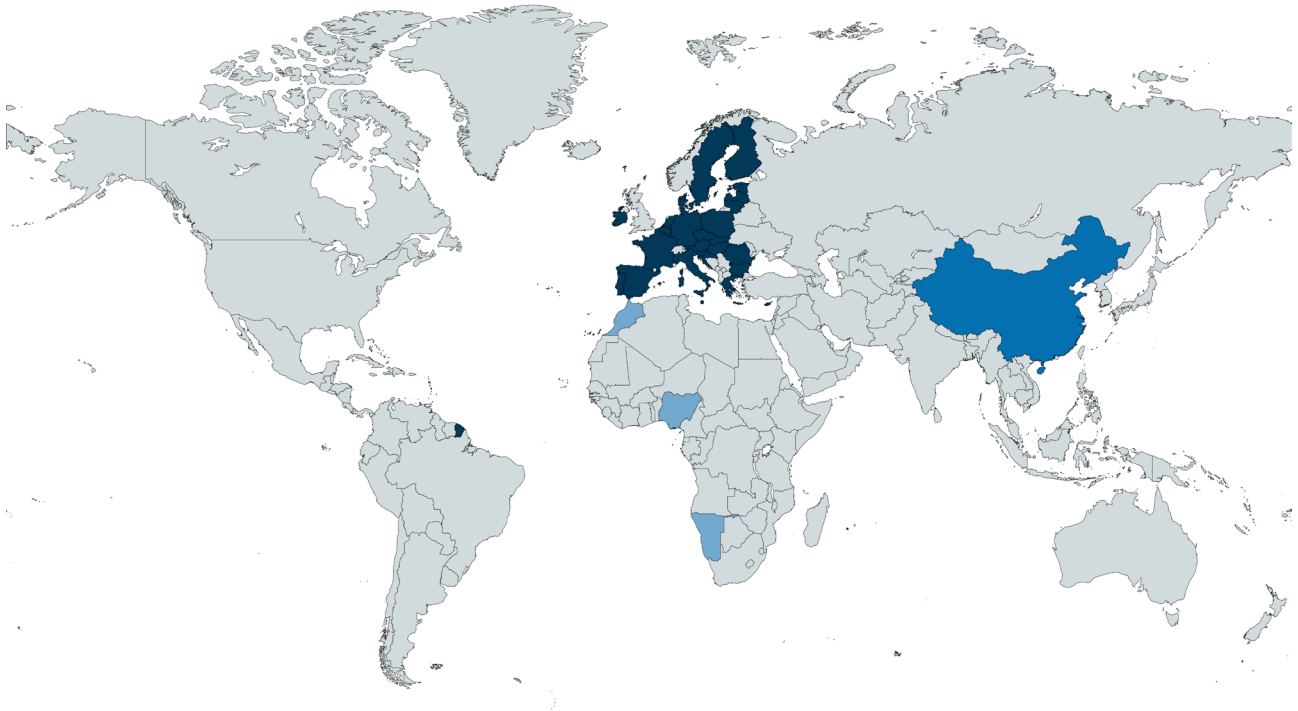
The influence of green bonds on renewable energy investment was not addressed unequivocally. These studies primarily emphasised the effect of geopolitics on the primary green finance market. Although the association between geopolitical risk, green bonds, and renewable energy is not fully explored, it is possible to highlight the relationships observed among two of the variables. The results indicate that the impact of geopolitical risk on green bonds is predominantly positive, especially regarding their issuance.

It is worth noting that, except for Lian and Hou (2024), who focused solely on China, studies on GB issuance employed globally representative samples. Advanced economies accounted for the largest green bond issuance (Mertzanis, 2023; Mertzanis & Tebourbi, 2025; Mertzanis & Houcine, 2025). The only emerging economy among the leaders in global issuance was China. EU members were also among the top issuers, while African countries were at the lower end of the issuance spectrum (Mertzanis, 2023; Mertzanis & Tebourbi, 2025). Figure 6 illustrates the global distribution of green bond issuance.

The difference in green bond issuance between advanced and emerging economies is strongly associated with the more established sustainable markets in developed countries. Developed nations possess the institutional mechanisms that enable green finance to expand, whereas many developing

countries struggle to implement incentives such as policies, regulations, and fiscal measures, which are considered key to the growth of the green bond market (Mertzanis & Tebourbi, 2025).

Figure 6. Regional Distribution of Global Green Bond Issuance



Source: Elaborated by the authors

Risk Management

The literature analysed volatility dynamics, spillovers, and the resilience of certain assets, particularly sustainable finance. This category focuses on the relationship between green bond investment and renewable energy. Several studies examined interactions among traditional energy indices, clean energy, and green bonds under extreme market and geopolitical conditions (Bajra et al., 2025; Deng et al., 2023; Gao & Liu, 2024; Ha, 2024; Lee et al., 2021; Lorente, 2023; Zheng et al., 2025).

Signalling theory is also referenced in this group of studies, although many analyses are grounded in modern portfolio theory (MPT). MPT focuses on maximising expected returns while mitigating risk, considering investor profiles and addressing aspects such as asset allocation (Elton & Gruber, 1997). The theory emphasises that it is insufficient to observe how a single asset responds to systematic risk; instead, one must consider how it correlates with other assets in the portfolio. Diversifying across asset classes can generate significant benefits, allowing investors to achieve the same expected return at a lower risk level compared with non-diversified portfolios (Elton & Gruber, 1997).

While MPT primarily addresses diversification, other risk mitigation strategies also draw on its principles. Several studies examined hedge and safe-haven assets, demonstrating how including

specific assets can increase portfolio resilience in adverse scenarios. The integration of different asset classes creates opportunities for the strategic use of sustainable finance, a pattern observed in the analysed literature.

These studies investigated the hedging and safe-haven properties of assets. Regarding hedging mechanisms, the connection between fossil fuels and geopolitical events was used to explore the role of green bonds. Hedging properties can be attractive to investors, encouraging renewable energy investment. Analyses of asset resilience during bullish or bearish market states or prior to geopolitical events address both risk management and renewable energy investment (Bouri et al., 2024; Dong et al., 2023; Lorente et al., 2023; Mohammed et al., 2025; Sohag et al., 2022).

Safe-haven assets, in contrast, exhibit resilience specifically during periods of extreme market uncertainty (Xia et al., 2024). The potential for green bonds to serve as safe havens under geopolitical risk was explored by Ahmed et al. (2024), Xia et al. (2024), and Aloui et al. (2025). Important characteristics for identifying hedging and safe-haven properties include volatility transmission and the relationship with geopolitical risk. This analysis is based on observing a collection of assets and their interactions before geopolitical acts and threats.

The Ukraine war and the COVID-19 pandemic are presented as scenarios of high geopolitical risk and economic uncertainty. While the pandemic was not originally considered in Caldara and Iacoviello's definition, many authors used both periods to analyse volatility transmission dynamics between green and conventional assets (Deng et al., 2023; Ha, 2023; Liu et al., 2024; Zhou et al., 2025). Green bonds acted as volatility receivers during periods of high GPR, which can be beneficial for renewable energy investment, considering the volatility of fossil fuels (Deng et al., 2023). Conversely, in comparison to other assets, this role could be disadvantageous, discouraging investment in green bonds (Zheng et al., 2025). Geopolitical risk was introduced as either a driver of spillovers and interconnectedness (Jin, 2025; Li et al., 2025; Lucey & Ren, 2023; Zhou et al., 2025) or as a volatility, risk, or shock transmitter/receiver (Deng et al., 2023; Gao & Liu, 2024; Ha, 2023; Liu et al., 2024). Most studies used S&P Global indices to represent the markets, enhancing the international relevance of the findings, though generalisation still depends on sample coverage.

Despite heterogeneous results, the relationship between green bonds, renewable energy, and geopolitical risk was identified. In some contexts, the relationship was positive, though this effect was not consistent across all analyses.

Sustainable Development

Several theoretical frameworks inform literature in this category, including business cycle theories, the energy ladder theory, Schumpeterian perspectives on innovation, corporate social responsibility theory, Pigouvian tax theory, central bank theory, game theory, stakeholder theory, and Douglas North's institutional perspective (Chishti et al., 2024; Christnacht & Mertzanis, 2025; Mertzanis, 2024; Mertzanis et al., 2025). This literature strand emphasises the energy transition beyond corporate

and financial market dynamics, considering the role of government planning, policy characteristics, and institutions such as central banks (Chishti et al., 2024; Mertzanis, 2023; Mertzanis, 2024). Nevertheless, corporate interactions and financial markets remain part of the analysis (Lin et al., 2023; Wang et al., 2023; Zhao et al., 2024).

Regarding the influence of green bonds on the energy transition, results are heterogeneous. Some studies examined the relationship between GB and renewable energy under geopolitical risk conditions. Chishti et al. (2024) considered the impact of sustainable finance, the Paris Agreement, the Belt and Road Initiative, and GPR on energy transition, detecting a negative effect of geopolitical risk on green bonds and the energy transition. Similarly, Zhao et al. (2024) found that geopolitical threats negatively affected renewable energy through green bonds.

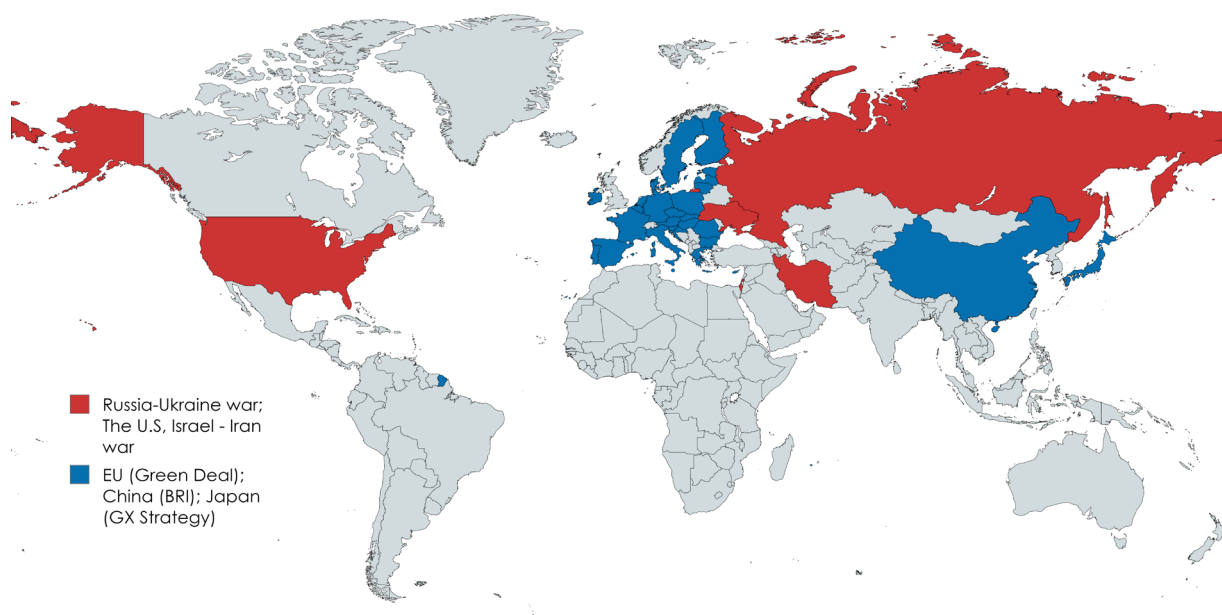
Mertzanis (2024, 2025) explored implementation, policy diversification, and green bond issuance, highlighting the influence of GB on business cycles (Chishti et al., 2024). Wang et al. (2023) reported heterogeneous effects of green bonds on geopolitical risk: while promoting energy security, they simultaneously stimulated conflicts over resources needed for renewable energy technologies.

Despite large country samples, efforts towards national sustainable development were geographically concentrated. China (BRI), Japan (GX strategy, net-zero roadmap, 2030 Basic Energy Plan), and EU members (Green Deal) were among the most active nations (Chishti et al., 2024; Taghizadeh-Hesary et al., 2023). Higher policy diversification and social tolerance were associated with positive impacts on GB issuance, consistent across most analysed countries (Mertzanis, 2023; Mertzanis & Houcine, 2025).

These studies highlight the influence of cultural, institutional, and regulatory factors on fostering sustainable finance and development. Such factors can facilitate or hinder government efforts, while geopolitical exposure and historical involvement in military conflicts often shape institutional environments. Volatile regions tend to have weaker institutions, slowing renewable energy adoption, whereas stable political environments provide a more conducive setting for implementing policies and tools for sustainable development (Mertzanis et al., 2025). Figure 7 links current geopolitical hotspots with major energy transition initiatives.

Geopolitical turbulence can either discourage or stimulate renewable energy investment. However, the nature of the conflict and the characteristics of the countries involved play a crucial role (Wang et al., 2023). Some articles considered both geopolitical risk and green bonds in their analyses without evaluating the relationship between them directly, focusing instead on other factors (Lin et al., 2023; Taghizadeh-Hesary et al., 2023). For example, Taghizadeh-Hesary et al. (2023) explored renewable energy development in Japan, using both geopolitical risk and green bonds as explanatory variables, without examining their interaction. The relationship between renewable energy, geopolitical risk, and green bonds produced heterogeneous results. In the evaluated articles, the context, the variables considered, and the GPR subindices—along with their behaviour—strongly influenced the outcomes.

Figure 7. Key Geopolitical Regions and Major Energy Transition Initiatives



Source: Elaborated by the authors

CONCLUSIONS

The influence of geopolitical issues on markets has been increasing. The construction of the geopolitical risk index by Caldara and Iacoviello (2022), alongside recent events such as the war in Ukraine and geopolitical tensions involving Iran, underscores the magnitude of this influence. Geopolitics affects financial markets, which in turn generate repercussions for the economy and the environment. Green bonds serve as one mechanism through which this process occurs. Since these financial instruments are particularly relevant for the energy sector, they can be perceived as a nexus connecting the impacts of conflicts and geopolitical turbulence with renewable energy investment. This study aims to explore the literature linking these three factors, using the geopolitical risk index developed by Caldara and Iacoviello.

The systematic review identified four core themes: hedging strategies, asset/portfolio diversification, volatility dynamics/transmission, and energy transition. Several articles addressed more than one theme. The most and least discussed topics were asset/portfolio diversification and energy transition, respectively. The association between geopolitical risk, green bonds, and renewable energy was divided into three categories, each representing how the factors are connected in the literature: “market positioning,” “risk management,” and “sustainable development.” Some articles spanned more than one category.

The analysed studies showed a geographical concentration in developed economies, with China as the only emerging economy consistently evaluated. The “sustainable development” literature highlighted the efforts of Japan, China, and EU members, focusing on government planning and policies

targeting energy transition and climate issues. Studies in the “market positioning” category included a broader country sample, highlighting differences in green bond issuance between developed and emerging economies. These findings underscore the predominance of nations from the global North over the global South, reflecting disparities in social and institutional frameworks that affect the maturity and performance of green markets.

The “risk management” category did not have an explicit geographical focus, as it examined market interactions and asset resilience/performance. Most studies relied on S&P Global indices to represent world market dynamics, typically using the global GPR index. In contrast, the only country-specific indices identified were for China and Japan, with analyses incorporating the geopolitical characteristics of these economies. Factors such as location, neighbouring countries, and exposure are crucial to understanding how a nation responds to different conflict stages, such as geopolitical threats or acts. Nonetheless, most studies relied on the global GPR index, limiting the analysis to responses to global geopolitical risks while considering only institutional, cultural, social, and economic characteristics of the sampled nations.

This study contributes to the literature by exploring the association between geopolitical risk, green bonds, and renewable energy. The results indicate a heterogeneous effect of GPR on green bonds and renewable energy, often depending on the conflict stage (threat or act) or the risk level (low, medium, high). Country-specific index characteristics were also influential. While Caldara and Iacoviello defined geopolitical risk in terms of wars and conflicts with cross-border spillovers, some studies broadened this definition to include events such as the COVID-19 pandemic, recognising their indirect geopolitical implications.

The study has limitations. The adoption of a specific GPR definition and index excludes other perspectives and factors that can influence financial markets, green bonds, and renewable energy, such as trade tariffs. The analysis period is also a limitation. Although the index has been widely used since 2018, the relationship between GPR and green bonds is not yet fully understood. Broader GPR definitions or comparisons across authors could allow for longer study periods and more comprehensive analyses.

Several directions for future research are suggested. The relationship between geopolitical risk, green bonds, and renewable energy was identified within the categories of “risk management” and “sustainable development.” However, this relationship was not evident in the “market positioning” category, obscuring the association between renewable energy and the other two factors—a clear gap in the literature. Future studies could examine how green bonds are employed to promote sustainability in this context. It is also noteworthy that green bonds (GBs) are used in sectors beyond energy. Additionally, future research should consider all three variables with a broader definition of geopolitical risk, addressing the limitations associated with using a single index and excluding studies that did not adopt Caldara and Iacoviello’s framework.

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APPENDIX A

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORETICAL FRAMEWORK
Chishti et al., 2024	Toward sustainable development: Revealing the dynamic impacts of the belt and road initiative on energy transition	Geopolitical risk negatively impacts green bonds and, consequently, the energy transition.	Pigouvian theory (Pigouvian tax) The energy ladder theory
Deng et al., 2023	Dynamic Connectedness Among Oil, Food Commodity, and Renewable Energy Markets: Novel Perspective from Quantile Dependence and Deep Learning	Geopolitical risk and green bonds are net volatility receivers before and after the beginning of the Russia-Ukraine war, being considered potential „buffers”. The renewable energy investment was stimulated by the elevated oil's volatility in the period. However, the RE investment was represented by a clear energy index. Green bonds were volatile through the entire analysis.	
Ha, 2024	A wavelet analysis of dynamic connectedness between geopolitical risk and renewable energy volatility during the COVID19 pandemic and UkraineRussia conflicts	Geopolitical risk negatively impacts renewable and green energy. The relationship between GPR and green bonds is negative.	
Mnif et al., 2025	Evaluating the effectiveness of green bonds and clean cryptocurrencies as hedging tools in volatile financial environments	Green bonds demonstrated potential to be hedging tools before geopolitical risk.	Portfolio theory Market efficiency hypothesis
Liu et al., 2024	Quantile Connectedness of Uncertainty Indices, Carbon Emissions, Energy, and Green Assets: Insights from Extreme Market Conditions	Geopolitical risk transmits volatility to green bonds but it is not the main source of impact.	
Soltani et al., 2024	Using machine learning to forecast clean energy, commodities, green bonds and ESG index prices: How important is financial stress?	Geopolitical risk negatively influences the price of green bonds.	
Hasan et al., 2024	The resilience of ethical assets against different uncertainty shocks	Green bonds have the potential to be hedging instruments before geopolitical risk.	
Aloui et al., 2025	Green bonds and clean energy stocks: Safe havens against global uncertainties? A wavelet quantile-based examination	Green bonds have the potential to be safe haven assets before geopolitical risk only in the medium/short run. In the long run, this potential decreases.	
Bajra et al., 2025	Connectivity of green financial assets under geopolitical risks and market-implied volatility	Green bonds are highly sensitive to geopolitical risk.	
Helmi et al., 2024	The impact of geopolitical risk on sustainable markets: A quantile-time-frequency analysis	The impact of GPR in green bonds is negative in the short run, but positive in the long run.	

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORATICAL FRAMEWORK
Zhang et al., 2023	The causal relationship between green finance and geopolitical risk: Implications for environmental management	Geopolitical risk impacts volatility and return of green bonds.	
Alnafrah, 2024	ESG practices mitigating geopolitical risks: Implications for sustainable environmental management	Companies that invest in green bonds are less exposed to geopolitical risk than companies that do not.	Framework „Quintuple Helix model” Financial Resilience Theory
Zheng et al., 2025	Dynamic risk spillovers between green bonds and energy markets: New evidence from the GARCH-MIDAS-D-Copula-CoVaR approach considering uncertainties	Green markets transmit volatility and make green bond less attractive during periods of high geopolitical risk. When considering the traditional market, this effect does not occur.	
Urom et al., 2024	Global macroeconomic factors and the connectedness among NFTs and (un)conventional assets	Green bonds are predominantly volatility recipients during extreme geopolitical and economic market conditions.	
Lorente et al., 2023	Dynamic connectedness among climate change index, green financial assets and renewable energy markets: Novel evidence from sustainable development perspective	Green bonds are negatively associated with geopolitical risk. Except for the COVID-19 period, they can hedge against GPR, especially, during the Ukraine war.	
Sohag et al., 2022	Do geopolitical events transmit opportunity or threat to green markets? Decomposed measures of geopolitical risks	The impact of GPR in green bonds is positive in scenarios of low/medium intensity. In these periods, green bonds become interesting hedging options. During high GPR scenarios (geopolitical act), the association is negative and the hedging potential weakens.	
Lin et al., 2023	Role of sustainable finance, geopolitical risk and economic growth in renewable energy investment: Empirical evidence from China	GPR negatively impacts renewable energy investment. Sustainable finance (GB) positively impact renewable energy investment.	
Lee et al., 2021	Oil price shocks, geopolitical risks, and green bond market dynamics	Geopolitical risk impacts green bonds, especially during bearish (lower quantile) markets.	Behavioral Theory (market reaction hypothesis)
Zhao et al., 2024	Modeling the Nexus between geopolitical risk, oil price volatility and renewable energy investment; evidence from Chinese listed firms	Through green bonds, geopolitical threat harms renewable energy investment in certain periods (COVID-19) and stimulate in others.	

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORETICAL FRAMEWORK
Wang et al., 2023	Promotion or hindrance? Exploring the bidirectional causality between geopolitical risk and green bonds from an energy perspective	Scenarios characterized by higher geopolitical risk harm the investment in green bonds. Lower geopolitical risk scenarios have a positive effect on GB. The effect of green bonds on geopolitical risk is heterogeneous (discourages conflict by promoting energy security, but stimulates the search for materials essential to RE production, ultimately leading to disputes).	
Taghizadeh-Hesary et al., 2023	Assessment of role of green bond in renewable energy resource development in Japan	Green bonds impact the consumption of wind, solar and hydro energy positively, stimulating the investment in these renewable sources. GPR impacts these sources negatively. Green bonds and GPR are used as explanatory variables and their relationship is not evaluated in the article.	
Dong et al., 2023	Can bonds hedge stock market risks? Green bonds vs conventional bonds	Green bonds are good hedging options during „normal” periods. During high GPR periods, both GB and traditional bonds are considered good hedging options.	Signalling Theory
Wang et al., 2025	Green bond market stability and Russia Ukraine conflict: The role of green inclusive finance	Only the short run was evaluated. Both markets were negatively affected by the conflict. However, in comparison with the inclusive GB market, the traditional green bond market was more affected. The inclusive GB market presented greater resilience.	
Christnacht & Mertzanis, 2025	Foreign direct investment, technology transfer and the global issuance of green bonds	Geopolitical risk was depicted as a control variable in the relationship between foreign direct investment and GB issuance. The results indicate that GPR positively impacts the issuance of green bonds.	Institutional Theory OLI framework Resource-Based Theory Corporate Social Responsibility Theory
Mertzanis et al., 2025	Managing environmental finance in the digital era: Evidence from green bonds	Geopolitical risk is an additional control variable in the analysis of the relationship between digital transformation and green bond issuance. The most influential variables were stable political conditions, lower enforcement costs, and the FinTechs market growth. The political conditions, despite referring to domestic and external (terrorism) matters, were represented by another variable. The GPR impact was not significant when compared to the mentioned variables. Therefore, geopolitical risk did not influence the relationship between digital transformation and green bond issuance.	Innovation Diffusion Theory Institutional Theory Stakeholder Theory Strategic Management Theory Game Theory

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORETICAL FRAMEWORK
Ahmed et al., 2024	Assessing the impact of Russian–Ukrainian geopolitical risks on global green finance: a quantile dependency analysis	<p>In the short run, the Russian geopolitical risk exhibited a positive relationship with green bonds during the bullish market and a negative relationship during the bearish market. There is no dependency between the variables in the medium term, and in the long term, the dependency is slightly negative and presents a downward trend.</p> <p>Regarding the quantile dependence, the same results were obtained for Ukraine. In the short run, the Ukrainian geopolitical risk presented a strong relationship with green bonds during bullish states and a strong negative relationship during bearish states.</p> <p>In the long run, both Russian and Ukrainian geopolitical risk presented a weak relationship with green bonds, highlighting their safe haven potential during periods of geopolitical turbulence.</p>	
Bouri et al., 2024	Do geopolitical risk, economic policy uncertainty, and oil implied volatility drive assets across quantiles and time-horizons?	<p>In the short run, green bonds are good hedging options due to their immunity to geopolitical risk.</p> <p>In the medium and long term, their immunity wakens, negatively impacting their performance as safe haven assets during periods of financial stress.</p> <p>Geopolitical risk was not the main influence for green bonds. The most influential factors were oil volatility (OVX) and economic and policy uncertainty (EPU), respectively.</p>	
Mertzanis, 2024	Central bank policies and green bond issuance on a global scale	<p>Geopolitical risk was an additional control variable in the relationship between central bank policies and their impact in green bond issuance. The GPR effect was not evaluated.</p> <p>The central bank policy that was beneficial to green bond issuance was the use of systemic risk tools.</p> <p>The impact from higher monitoring and enforcement intensity was negative.</p>	<p>Central Bank Theory</p> <p>Game Theory</p>
Guesmi et al., 2025	Climate change exposure and green bonds issuance	<p>Geopolitical risk was an additional control variable in the analysis. The GPR influence was not highlighted in the article.</p> <p>According to the results, firms that are exposed to climate change exhibit a propensity to issue green bonds. This relationship is mainly motivated by the desire of firms to protect themselves against regulatory and physical risks instead of capitalizing on new climate-related opportunities.</p>	
Fiorillo et al., 2024	Geopolitical turmoil and investor green preference: Evidence from the corporate bond market	<p>GPR (act) was the greatest influence in greenium (negative risk premium) in the secondary market for green bonds, surpassing geopolitical threat among initial issuances and the ones considered high risk.</p> <p>Geopolitical risk influences investors to give preference to green bonds certified by a third party over bonds that have not been certified.</p>	Signalling Theory

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORETICAL FRAMEWORK
Mertzanis, 2023	Energy policy diversity and green bond issuance around the world	<p>Geopolitical risk is an additional control variable in the analysis, moderating the relationship between energy policy diversification and green bond issuance. Therefore, the results indicate that, in average, countries with diversified energy policies tend to higher levels of green bond issuance.</p> <p>However, changes in policies targetting environmental issues do not have an immediate response due to the amount of time it takes for investors to be aware of the changes.</p>	Game Theory
Mertzanis & Houcine, 2025	Social tolerance, environmental responsibility and green bond Market growth	Geopolitical risk is an additional control variable in the analysis. The impact of GPR is highlighted, as well as the impact of other variables. The results indicate that high geopolitical risk positively impacts green bond issuance.	<p>Social Capital Theory</p> <p>Human Capital Theory</p> <p>Institutional Theory</p> <p>Stakeholder Theory</p> <p>CSR Theory</p> <p>Innovation Diffusion Theory</p> <p>Game Theory</p>
Kojić et al., 2024	Complex non-linear relationship between conventional and green bonds: Insights amidst COVID-19 and the RU–UA conflict	<p>Conventional bonds presented higher sensitivity to geopolitical risk when compared with green bonds. However, both markets showed resilience to GPR.</p> <p>The results indicate that there is not a great difference when it comes to performance, meaning that the type of bond is defined by the personal preference of the investor.</p>	
Sheenan, 2023	Green bonds, conventional bonds and geopolitical risk	Green bonds presented higher sensitivity to geopolitical risk than conventional bonds in both regimes, especially during high volatility conditions.	
Lian & Hou, 2024	Navigating Geopolitical Risks: Deciphering the Greenium and Market Dynamics of Green Bonds in China	<p>The analysis considered the recent geopolitical risk index, China's GPR, the historical GPR index, and geopolitical acts and threats.</p> <p>Accroding to the findings, geopolitical risk increases green bond prices promoting a cost advantage (greenium) over conventional bonds. This pattern was observed in all indices, but geopolitical act had the greatest impact.</p> <p>In the financial sector (secondary market), the results were the same. However, green bonds did not perform as well as they did in the primary market, with advantages falling below the sector average.</p>	Signalling Theory

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORETICAL FRAMEWORK
Chishti et al., 2024	Can artificial intelligence and green finance affect economic cycles?	<p>The geopolitical risk index represented economic cycles and green bonds represented green finance in the analysis.</p> <p>According to the results, the impact of green bonds in economic cycles is heterogeneous in the short run. In the long run, the impact is predominantly positive. These findings highlight the ability of green finance to decrease economic cycles in the long run. This pattern was observed in the context of the COVID-19 pandemic and the Ukraine war.</p>	<p>Economic Cycles Theory</p> <p>Schumpeterian Theory</p> <p>Endogenous Growth Theory</p>
Zhang et al, 2025	New energy mineral price shocks and volatility responses in green securities markets: Structural effects and dynamic spillovers	<p>In order to represent green finance in China, the article used a green bond index and a green stock index.</p> <p>The results revealed a significant impact of geopolitical risk in green finance, with green bonds displaying higher sensitivity than green stocks, especially during the COVID-19 pandemic. The justification could be associated with the negative effect the pandemic had on supply chain, impacting sustainable projects.</p>	
Li et al., 2025	Navigating extreme risk spillovers: Building a synergistic network of rare earths, green bonds, and clean energy markets in China	<p>Green bonds received volatility from other markets during the entire analysis. The data indicated the presence of contagion, evidencing a strong connection between them. Geopolitical risk strengthened this pattern, mainly during high GPR periods.</p> <p>Among the conduction factors included in the analysis, GPR was the most influential factor in the volatility spillovers between markets during low quantile periods.</p>	<p>Natural Resources Price Theory</p> <p>Capital Asset Pricing Model (CAPM)</p> <p>Hedging Theory</p> <p>Modern Portfolio Theory</p>
Lucey & Ren, 2023	Time-varying tail risk connectedness among sustainability-related products and fossil energy investments	<p>The article evaluated the spillovers between green indices, energies in the future market, and energy stocks. Geopolitical risk was introduced in the analysis as a conducting factor.</p> <p>The results indicated that GPR did not have a significant impact in the relationship between green bonds and the other variables. Green bonds transmitted and received low levels of volatility, receiving risk during most of the analyzed period.</p>	
Jin et al., 2024	Energy transition and housing market bubbles: Evidence from prefecture cities in China	<p>Geopolitical risk was included in the analysis as an additional control variable and green bonds as interaction variables to moderate the relationship between the energy transition and the housing market bubbles.</p> <p>During high and low GPR scenarios, the energy transition negatively impacted the Chinese provinces housing market bubbles. Even with the inclusion of green bonds, the negative effect remained.</p> <p>The relationship between geopolitical risk and green bonds was not explored.</p>	<p>Singalling Theory</p> <p>Portfolio Theory</p> <p>Production Factor</p> <p>Substitution Theory</p>

AUTHORS	TITLE	IDENTIFIED FACTORS	
Mohammed et al., 2024	The heterogeneous reaction of green and conventional bonds to exogenous shocks and the hedging implications	<p>The article considered the indices of geopolitical risk and act.</p> <p>According to the results, green bonds are efficient hedges against geopolitical risk and act, and periods of financial stress.</p> <p>Green bonds performed better than conventional bonds, especially corporate bonds.</p>	Signalling Theory
Ha, 2023	An application of QVAR dynamic connectedness between geopolitical risk and renewable energy volatility during the COVID-19 pandemic and Russia-Ukraine conflicts	<p>In the short run, geopolitical risk is a shock recipient. In the long run, GPR becomes a transmitter.</p> <p>Green bonds were shock recipients in both terms.</p> <p>After the beginning of the Ukraine war, GPR became one of the main shock transmitter to green bonds, in comparison with other risk indices.</p>	Cobb-Douglas Production Model
Zhou et al., 2025	The role of uncertainty in return spillovers among digital, green, and traditional financial assets: New insights from the shock of unprecedented events	<p>Green bonds were shock recipients during most of the analysis period. Still, they influenced other assets.</p> <p>The COVID-19 pandemic amplified the return spillovers between green and digital assets.</p> <p>Geopolitical risk was one the main factors influencing total spillovers during extreme market conditions.</p>	Extreme Value Theory (EVT)
Mertzanis & Tebourbi, 2025	Geopolitical risk and global green bond market growth	<p>The analysis considered geopolitical threats and acts. Both were positively correlated with green bond issuance, even though geopolitical threats had a greater impact.</p> <p>The results indicated that high geopolitical risk stimulates green bond investment. However, changes in geopolitical conditions did not have an immediate or linear effect in green bond issuance.</p>	<p>Signalling Theory</p> <p>Game Theory</p>
Będowska-Sójka et al, 2022	Hedging Geopolitical Risks with Different Asset Classes: A Focus on the Russian Invasion of Ukraine	<p>High geopolitical risk, characterized by the beginning of the conflict, impacted markets differently.</p> <p>Green bonds are among the assets that presented greater resilience to the changes in GPR, displaying hedging potential against military conflicts.</p>	
Xia et al., 2024	Can Green Bonds Hedge Against Geopolitical Risk? A Cross-Market Connectedness Analysis With Portfolio Implications	<p>The analysis used the general geopolitical risk index and the country indices for China and Japan.</p> <p>The results indicate that GPR impacts green bonds returns in the EU, USA, and Japan makets, but not in the Chinese market. The spillovers between green bonds and GPR were limited in China, but intense in the other regions during high geopolitical risk periods.</p> <p>Additionally, only green bonds in China and Japan presented hedging properties, despite being weak. In the Chinese market, the analysis detected hedging properties and potential safe haven assets.</p>	<p>Real Option Theory</p> <p>Modern Portfolio Theory</p>
Jin, 2025	Extreme Risk Connectedness and its Determinants Between Carbon, Green Finance and Energy Markets	<p>Green bonds were used to represent green finance.</p> <p>The results indicated a connectivity between carbon, green finance, and energy markets. However, geopolitical risk did not influence this connection.</p>	

AUTHORS	TITLE	IDENTIFIED FACTORS	THEORETICAL FRAMEWORK
Gao & Liu, 2024	Time and frequency spillovers and drivers between rare earth and energy, metals, green, and agricultural markets	Green bonds were risk recipients in the analysis. Geopolitical risk harmed the spillover dynamics between the evaluated markets, which could indicate that GPR weakens the connection between them in certain periods.	Signalling Theory Financial Accelerator Theory Rational Expectation Theory (J. Muth) Portfolio Theory

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Maiga, Yaya¹

Farmers–Herders Conflicts in the Bougouriba (Burkina Faso): Beyond Political Ecology, the Dual Challenges of Insecurity and Land Tenure Instability

ABSTRACT

Climatic variability at both global and local scales, compounded by the security crisis affecting Burkina Faso since 2015, has driven new dynamics of agro-pastoral conflicts, particularly in the Bougouriba province. This study aims to analyze farmer–herder conflicts in Burkina Faso through the prism of political ecology and the prevailing national security context. It first examines the contentious dynamics surrounding the control of natural resources, notably land, water, and pasture. It then investigates the climatic, environmental, and socio-political drivers of these conflicts, including widespread insecurity, land tenure precarity, and infrastructural crisis. The study draws on political ecology, conflict proximity theory, fieldwork based on structured interviews with both open-ended and closed-ended questions, and thematic documentary analysis. Conflicts over access to land, grazing, and water are evolving from less violent forms (stereotyping, marginalization, stigmatization, and threats) toward more overt forms (eviction of herders, crises or explicit threats of confrontation between stakeholders, sorcery, cases of livestock poisoning or slaughter, and terrorist attacks or incursions). These conflicts symbolize a dynamic of spatial appropriation, reflecting both the desire and the necessity to control natural resources. They are also justified by the repercussions of climate change/variability on pastoral and agricultural activities (IIF=0.82/1), infrastructure problems (IIF=0.76/1), and security issues (IIF=0.54/1). They disorient herders and stimulate livestock movements toward internal and external fallback sites.

Keywords: Bougouriba, insecurity, farmer–herder conflicts, local land governance, political ecology, Burkina Faso

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Acknowledgments: We would like to thank the entire field team, in particular MAIGA Fousséni, all the herders and farmers of Bougouriba, the local, traditional, and religious authorities, the town hall, the decentralized departments of the environment, livestock, and agriculture, as well as the defense and security forces of Bougouriba who participated in this research. We would also like to thank NELGA, GIZ, and PLAAS for supporting this research.

INTRODUCTION

The socio-climatic crises affecting Sub-Saharan Africa are hampering the use of natural resources (water, land, vegetation). They are driving population movements, impacting economic activities (agriculture and livestock farming), and creating unprecedented competition among users. Competition for access to these natural resources gives rise to conflicts (Doligez et al., 2016; Djohy et al., 2022).

The droughts of the 1970s and 1980s (Pale & Da, 2016), combined with the political and security instability that Burkina Faso has been experiencing since 2015, are believed to have stimulated and exacerbated agro-pastoral conflicts in the province of Bougouriba. These conflicts and tensions also reflect emerging political and economic challenges in this region of Burkina Faso. They revolve around access to land, grazing areas, and water resources. Accordingly, this study addresses the following questions: How do territorial issues or natural resource governance contribute to the dynamics of farmer–herder conflicts? What factors influence these conflicts?

Farmer–herder conflicts have been widely discussed in the literature (Bello & Kazibwe, 2021). Political ecology is often invoked to explain these conflicts (Gautier & Tor, 2012; Tor & Ba, 2018; Ogu, 2022). In Burkina Faso, however, only a few studies have addressed this issue (Gonin & Tallet, 2012; Gonin, 2014; Gonin & Gautier, 2015). Furthermore, there is limited research drawing on the local resource governance framework to overcome the limitations of political ecology (Amoah et al., 2025, p. 4).

This study, based on the customary land tenure system, incorporates the dynamics of insecurity and the precarious land tenure of pastoral lands into the analysis of conflicts between farmers and herders. We therefore start from the premise that the weak network of agricultural and pastoral infrastructure in the province further modulates and transforms climatic constraints, thereby giving rise to conflicts. In addition to environmental and resource-related factors, we argue that socio-political factors—characterized by a provincial vacuum in livestock policy, limited pastoral infrastructure development, and territorial issues related to access, use, and control of resources, particularly land—also play a significant role. By documenting conflicts between farmers and livestock breeders in the province of Bougouriba, this study contributes to the ongoing debate on these conflicts.

LITERATURE REVIEW

Climate change refers to any change or modification in the climate over time, whether attributable to human activities or natural variability (IPCC, 2021; IPCC, 2022, p. 11). Under conditions of climate variability, noticeable changes occur in the patterns and distribution of precipitation, fluctuations in temperature, and, consequently, abnormal variations in various climatic parameters.

A changing climate poses numerous potential challenges for both human and natural systems (Jeffrey et al., 2012, p. 3). It disrupts agricultural practices and, in this specific case, impacts and transforms livestock production systems. These profound changes in the way these activities are

carried out can create tensions with far-reaching consequences. Several studies have established links between changing climates and violent conflicts (Banett & Adger, 2007; Clionadh & Henrik, 2007; Qian et al., 2023), or more specifically between climate change and/or variability and conflicts between farmers and herders around the world, particularly in Asia (Devesh et al., 2012), East Africa (Nowag, 2020), West Africa (Bello & Kazibwe, 2021), and especially in Burkina Faso (Gonin & Tallet, 2012; Gonin, 2014, p. 222).

Indeed, variations in climatic parameters such as temperature, rainfall, wind, sunshine, and evapotranspiration negatively affect both agricultural and pastoral activities. These variations can cause flooding, but also—especially when combined with certain farming practices—lead to drying, severe land degradation, and a decline in soil fertility. This, in turn, affects agricultural production through reduced yields and a continuous decrease in cultivated land area (Diallo, 2021). According to Botoni (2003), such climatic variations increase the expansion of agricultural land into areas previously used as natural pasture. They also negatively affect animal productivity (Djenontin et al., 2009; Doti, 2010; Djenontin, 2010). Other sources indicate that these variations disrupt herding systems and stimulate persistent seasonal migration in search of better grazing areas and watering points for livestock (Banoïn & Jouv  , 2000; Djohy & Sounon, 2020, p. 18; Djohy et al., 2022). These climatic changes thus threaten stability and the local and regional social climate in West Africa (Brown & Craxford, 2010; Seiyefa, 2019). Several studies present transhumance as a response to climate variability at both regional and continental (African) scales (Scoones, 1995; Gonin & Tallet, 2012).

For other authors, conflicts between farmers and herders result from a combination of socio-economic and political factors that go beyond environmental, ecological, and climatic drivers, as documented particularly in studies on the Sahel (Hellendorff, 2012; Tor & Ba, 2018 and 2024). According to Hellendorff (2012), it is more appropriate to examine environmental impacts and climate variability at a much more local scale rather than at regional or global levels. Buhaug (2015), in his review of the relationship between violent or internal conflicts and climate change, suggests that it is more relevant to speak of indirect or conditional links. Thus, agro-pastoral conflicts may also result from the failure of a long series of pastoral development policies or from policy frameworks that prioritize agricultural activities over pastoral ones.

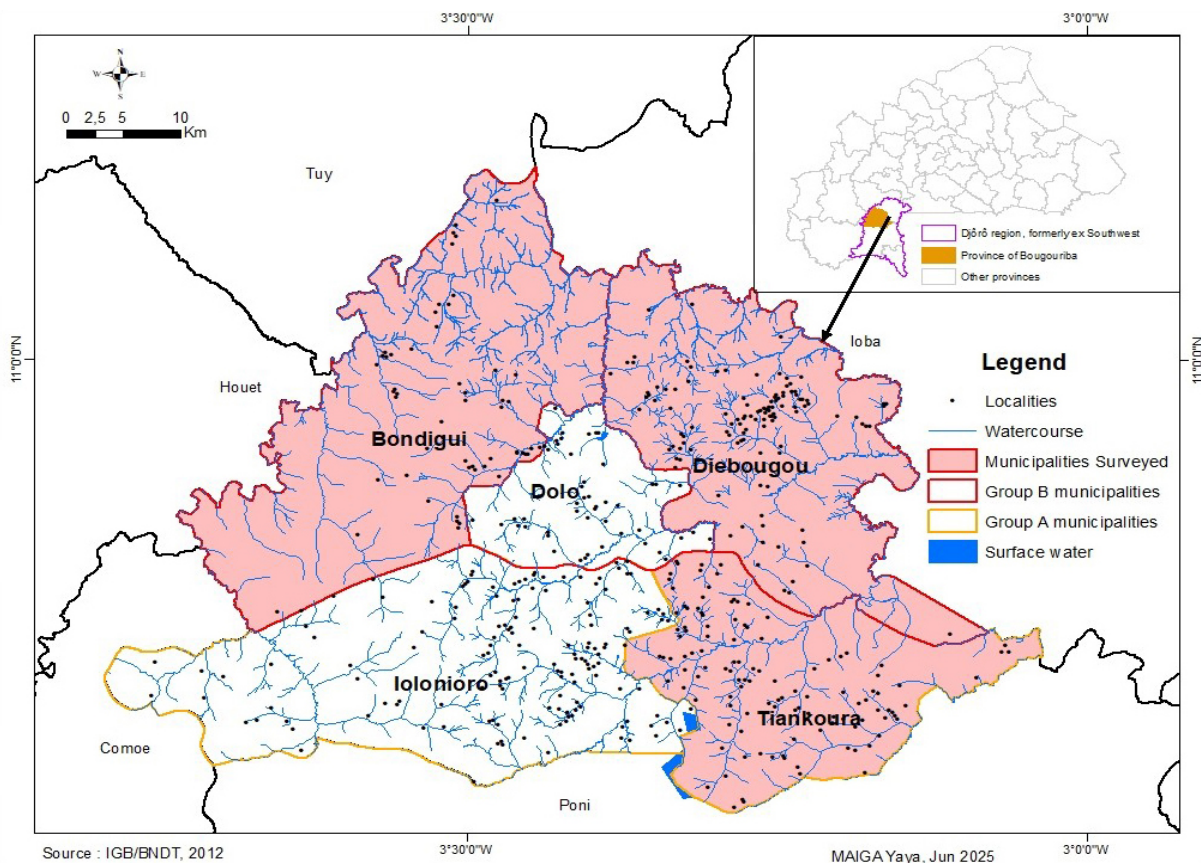
METHODS

Geographical Framework of Research and Methods of Field Data Collection

The area covered by this study is the province of Bougouriba, located in the southwestern part of Burkina Faso between 10°30' and 11°35' north latitude and between 2°55' and 3°45' west longitude. It comprises the municipalities of Diebougou, Bondigui, Tiankoura, Dolo, and Iolonioro, and is bordered to the north and east by the provinces of Tuy and Ioba, respectively; to the west by the provinces of

Houet and Comoe; and to the south by Poni. The province is bounded and delimited by the Bougouriba River, a tributary of the Mouhoun (Figure 1).

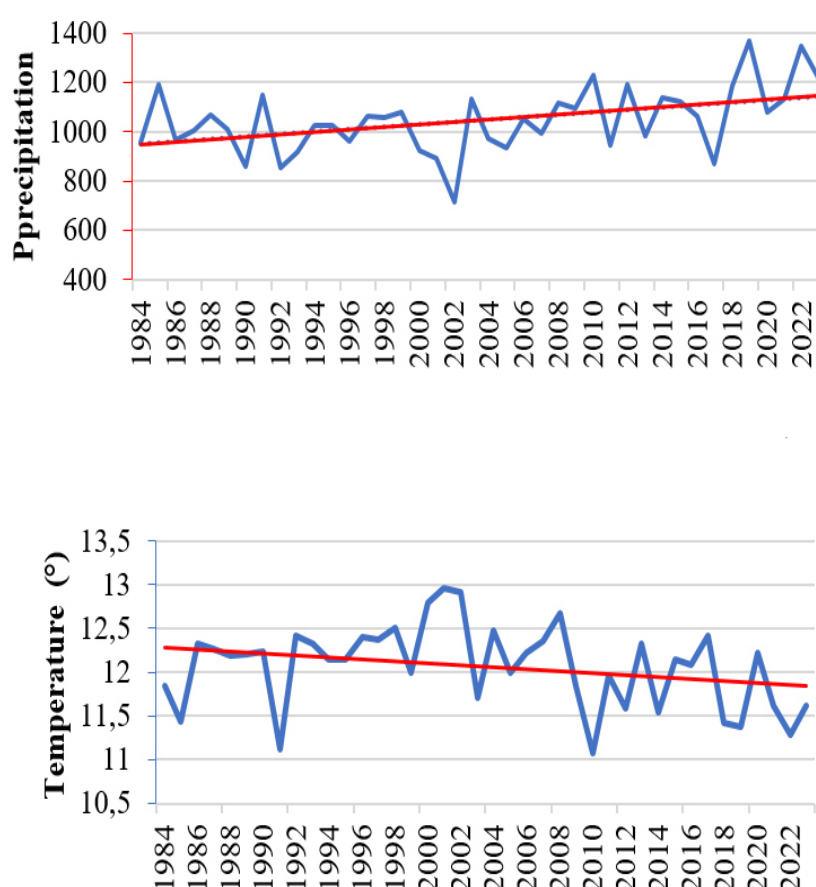
Figure 1. Geographical Location of the Study Area



It had a population of approximately 153,653 according to the latest general population and housing census of 2019 (INSD, 2022). This population growth in the southwestern part of Burkina Faso (also reported in studies by Sangli (2011) and Sangli & Tallet (2012)) can be explained by agricultural and pastoral migration from north to south, as well as the political will to develop hydro-agricultural land in this geographical area of Burkina Faso (Ouédraogo, 1986; Cambrézy & Sangli, 2011, p. 81) and the recent surge in gold mining activity (Bamogo & Sory, 2025). The province is religiously diverse (49.7% local religions, 30.2% Muslim, 12.2% Catholic, 7% Protestant, and 0.20% no religion) and ethnically diverse, with the main ethnic groups being the Dagara, Birifor, Lobi, Gan, Djan, Pougouli, Bwaba, Dagara-Dioula, Fulani, and Mossi (INSD, 2022, p. 5 and 20; Werthmann, 2004, p. 6). Figure 2 shows significant variability in rainfall and temperature from 1984 to 2023 in the research area.

Despite these climatic variations, the work of Some et al. (2024, p. 7) indicates average forage values of 1,875 kg/ha in the southern Sudanese region where the study province is located, compared to 732 kg/ha in the Sahelian region and 1,452 kg/ha in the northern Sudanese region. In fact, approximately 80% of the feed consumed by herbivores in Burkina Faso comes from natural pastures (INERA, 2017 cited by Ouoba-ima, 2015, p. 20).

Figure 2. Year-on-Year Variation in Rainfall and Temperature in Bougouriba



Source: National Meteorological Agency (ANAM), Gaoua Station, 2024

The demographic sample was constructed using graph sampling. The province, comprising five communes, was divided into two groups (Figure 1): Group A (Tiankoura and Iolonioro, with an indigenous Lobi population) and Group B (Diébougou, Bondigui, and Dolo, primarily Djan and Pougoulis) (Savonnet, 1975; Nebie, 1988, p. 261). This grouping was based primarily on shared community and socio-ethnic characteristics among the entities within each group, which are reflected in land tenure systems, conflict management practices, and, most importantly, the integration between indigenous groups and migrants, particularly herding groups in the case of this study. These groups thus constituted the sampling units. Within each large group, the study municipalities were selected, taking into account differences in sensitivity among municipalities within the same group. The surveys were conducted with a total sample of 100 people distributed among the municipalities of Diébougou (40 interviewees), Bondigui (40 interviewees), and Tiankoura (35 interviewees) over a five-month period (May, June, July, August, and September 2025). This involved identifying individuals who were victims or witnesses of farmer–herder conflicts by establishing contact as the data collection progressed. The interviewees comprised 45 livestock farmers, 45 crop farmers, and 5 administrative authorities: Presidents of the Special Delegation (PDS) with the status of Mayor in

the context of Burkina Faso's political transition; Village Development Councillors (CVD); the chief of the Diebougou municipal police; and an agent from the provincial département of agriculture and livestock. In addition, there were 2 decentralized technical agents from the agriculture and livestock sector, 2 livestock leaders, and a land chief.

The questionnaire, consisting of closed and open questions, focused on the nature, types, resurgence, and factors of agro-pastoral conflicts, as well as access to, use of, and control over natural resources (land, water, pasture), and conflict resolution mechanisms. In addition, the purpose of the survey was explained to each participant to encourage participation, while ensuring the anonymity of respondents through the use of codes. The geographic surveys involved collecting the geographic coordinates of agro-pastoral infrastructure (such as livestock markets, vaccination posts, boreholes, and watering holes) using a GPS, followed by the extraction of infrastructure data through the vectorization of old mapping reports of agro-pastoral infrastructure. Thus, these GPS points did not include livestock trails. This is justified by the near-absence of livestock trails on the ground and terrain difficulties, such as the discontinuity of these trails' routes in the landscape. Added to this is the absence of markers on the ground, and at times even of visible paths allowing for the identification of these trails, despite the guidance provided by livestock officers and the local population.

Data Analysis Methodology

The secondary data were obtained through a rigorous literature review (review articles, other publications, NGO reports, and pastoral and agricultural texts and policies) focusing on the interactions between climate change/variability and farmer–herder conflicts, the socio-political determinants of agro-pastoral conflicts, and political ecology. The qualitative data from open-ended questions were transcribed and analyzed using content analysis, which allowed for the reconstruction of narratives, the inclusion of quotations from respondents as illustrations, and the reinforcement of these accounts through interpretation. This qualitative data was further enriched by quantitative results and analytical theories. Descriptive statistics (cumulative frequencies, rates, frequencies, and factor importance indices) served as the basis for the analysis of quantitative data collected through closed-ended questions. The citation frequency is expressed as follows: $F_c = f/N$, where f represents the number of respondents for the typology or factors of agro-pastoral conflicts and N the total number of respondents.

Furthermore, the factors contributing to agro-pastoral conflicts were identified and then classified based on the calculation of the degree or index of importance of the factors (IIF). This classification followed a process involving asking participants to identify factors (predefined, with the option for respondents to add to or extend the list) and to rate the degree or level of importance or involvement of the identified factors on a scale of 1 to 5. This data collection method thus compels respondents to refine their answers and allows them to define their perceptions based on their daily experiences. The method (through these scales) has the advantage of preventing participants from making arbitrary

choices. The stage of capturing respondents' perceptions and levels of certainty through classification on a scale of 1 to 5 is essential for calculating the IIF. This allows factors to be compared by classifying them in the form of a hierarchy of causes or factors. Although borrowed from civil engineering to identify the causes of errors in construction (Assaf & Sadiq, 2006), this index was also used by Yanogo (2023) to determine the importance of market gardening systems in a context of climate variability in Burkina Faso.

$$\text{IIF} = \frac{a}{5 * N} \sum_{i=0}^n n$$

where IIF is the factor importance index, a is the weighted constant of the responses (which varies on a scale of 1 to 5), n is the frequency of responses, and N is the total number of responses. The index varies from [0 to 1].

The analytical framework of this work relies primarily on political ecology (Bassett, 1988; Bassett & Peimer, 2015) to analyze farmer–herder conflicts in the research area, placing the environment, space, and natural resources (forage, land, and water) at the heart of these conflicts. This framework allows us to juxtapose access to natural resources such as land, pastures, and water with conflicts between these two user groups. In other words, the concept of political ecology is used to examine the dynamic relationships that exist between farmer–herder conflicts (in their various forms) and resource scarcity, considering issues of access rights and resource control (Gautier & Tor, 2012, p. 6). The aim is therefore to gain a better understanding of conflicts between farmers and herders by examining the interactions between power, governance, nature, and human societies. The political ecology approach invoked in this study also provides a framework for analyzing local land governance to support this perspective.

Thus, similar to the geography of conflict (described below), this approach in the social sciences places the environment and local communities in interaction (Kull, 2012, p. 2). The data analysis also draws upon the proximity theory of conflicts, particularly its geographical approach (Sénécal, 2005). This geographical approach to Gilles Sénécal's proximity conflict theory places actors or subjects in interaction with their environment (Touraine, 1974). While the theory is generally used in urban planning and development, our aim is to leverage space to understand agro-pastoral conflicts in the study area within a specific context of insecurity and climate variability. Thus, this theoretical approach places space at the heart of conflicts, which may be open, tense, or latent.

The proximity underlying these conflicts between agriculture and livestock farming is explained in this specific case by the mobility of animals/herders, as well as by the relative stability resulting from the sedentarization of livestock farmers. Thus, livestock farming, by virtue of its proximity to agriculture, immediately enters into competition with the latter for various natural resources. As Melé (2013) states, this proximity is not simply a matter of measurable distance, a close neighbor, or a clearly defined territory. Beyond conflicts arising from the proximity of these two activities, conflict

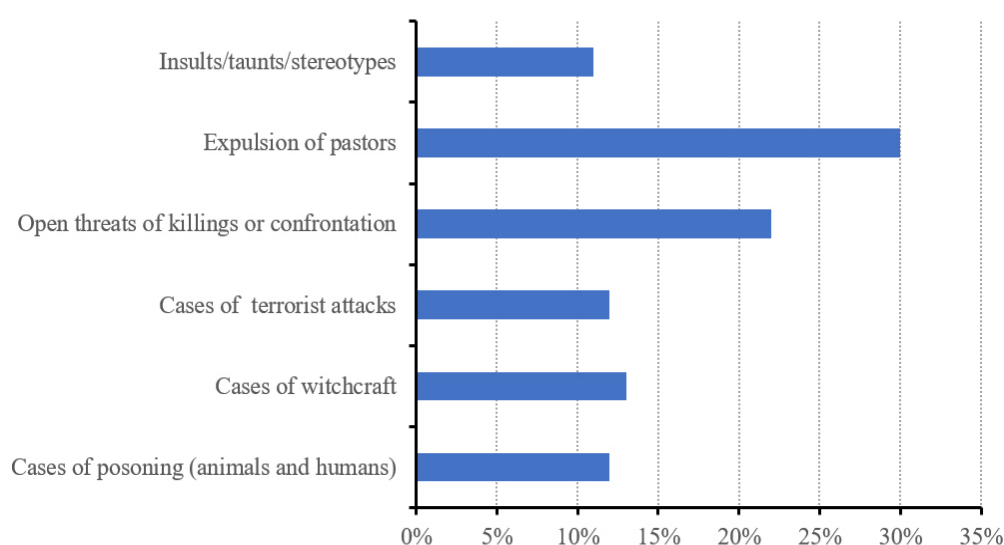
theory, according to Melé (2013) and Coser (1982), also makes it possible to identify potential avenues for resolution or mechanisms for regulating these social tensions.

RESULTS

From the Nature to the Dynamics of Farmer–Herder Tensions in the Bougouriba Region

A variety of forms of agro-pastoral conflicts can be identified in the province of Bougouriba (Figure 3), although some relations between farmers and herders are marked by hospitality in Africa (Komi, 2018, p. 77). As a reminder, an agro-pastoral conflict, in the context of this study, is any violent, open, or latent conflict centered on pastoral and agricultural practices. These conflicts may involve two or more individuals or communities with opposing needs, ideas, beliefs, values, interests, or objectives. They are characterized by tensions, emotions, disagreements, and polarization.

Figure 3. Types of Agro-Pastoral Conflicts in the Province of Bougouriba



Source: Field survey, 2025, Laboratory work

According to Figure 3, the types or forms of agro-pastoral conflicts range from mild or less violent forms (n=11; 11%), focused on insults, taunts, stereotypes, stigmatization, and threats, to 89% of violent and open manifestations. These include evictions/persecution of herders/sorcery (n=43; 43%) and crises or open threats of confrontation between stakeholders, especially on the part of victims or farmers in cases where they have observed herders' animals grazing on their land (n=22; 22%). These stereotypes may contribute to the marginalization of the Fulani herding minority. In addition to these forms of open declarations or conflict arising from tensions, there were also cases of livestock poisoning (12%; n=12). This involves poisoning field boundaries using local or traditional methods or

products. As a reminder, the typologies or forms of conflict manifestation presented in Figure 1 above were predefined (with some flexibility) in the questionnaire sent to the informants.

In addition to these violent types of conflict, there are also terrorist incursions ($n=12$; 12%), which are reported in some media outlets and online sources². Thus, the communes of Diébougou, Bondigui, and Iolonioro stand out from typical agro-pastoral conflicts, as they are also marked by terrorist incursions and probable or potential terrorist camps in the past (2018, 2019, 2020, 2021, and 2022) in certain localities such as Nahirindon, Intié Dougou, Nabéré, Nabalê, Darodine, Zanawo-Pougouli, Diarkadougou, and Bonfesso in Bondigui; and Moulé, Tiédia, and Dioukargo in Diébougou. These documented terrorist incursions—although difficult to attribute to a specific social group—are believed to have reignited tensions between farmers and herders. They are classified as farmer–herder conflicts in this study because they are believed to have contributed to increasing pressure on the herder community, particularly the Fulani, in the study area. We do not, therefore, intend to characterize these terrorist attacks recorded in the past as conflicts directly pitting farmers against herders.

This mounting pressure on Fulani herders is believed to have driven them to migrate, as evidenced by the interview excerpt above, reflecting large-scale displacement of the predominantly pastoralist Fulani population. These same observations are also reported by 2.5/3 of those interviewed in Bondigui, who acknowledge the departure of the pastoral population from the commune, particularly from wooded areas such as Mougué, Nahirindon, Intié Dougou, Nabéré, Nabalê, Darodine, Zanawo-Pougouli, Diarkadougou, and Bonfesso. “Today, when you look here in Bondigui, many Fulani have left for Ivory Coast and Ghana” (Excerpt from an interview with a herder leader in Bondigui, 19/08/2025).

The statistics and types of conflicts listed above also demonstrate the dynamic nature of farmer–herder conflicts within the provincial territory. This is evidenced by Daré’s description of the various sources of tension surrounding water sources in the Bougouriba sub-basin (2016, p. 10). While the study area is rarely documented by international NGOs focused on violent conflicts, our field investigations reveal a region experiencing a rise in conflicts related to land and natural resources (gold, water, land, and pasture). Thus, three-quarters of the field accounts indicate a resurgence of conflicts between farmers and herders from 2010 to 2023 and a relative lull during the years 2024–2025.

The nature of the conflicts also appears to have changed with the terrorist attacks perpetrated in the study province between 2018 and 2023, notably with accusations of ethnic bias, with Fulani herders being the most frequently targeted. We cite as an example the 2013 conflict between farmers and herders in the village of Dankotanzour in Navièlgane (Diébougou), which arose following damage caused by a herder’s cattle in a farmer’s field and was also documented by the media outlet “all Africa” (<http://fr.allafrica.com/stories/20131120510.html>). The subsequent lull in conflict is attributed to the mass exodus of Fulani herders following pressure exerted on this group. Furthermore, excluding

² <https://www.lobspaalga.com/2022/06/28/offensive-dans-la-bougouriba-au-moins-22-terroristes-tues-et-de-larme-ment-recupere/>
<https://filinfos.net/2022/06/28/securite-au-moins-22-terroristes-neutralises-dans-la-bougouriba/>

terrorist attacks, Brottem's study (2021, p. 2) shows a trend of escalating clashes between farmers and herders in Burkina Faso (including the southwestern region) from 2010 to 2021.

These agro-pastoral conflicts in the Sahel are hardly a recent phenomenon (Grünwald, 2023). They are the result of several latent conflicts, internal rivalries, and longstanding disputes (Haidara, 2023, p. 367), including land conflicts that can quickly evolve into conflicts between social or occupational groups, particularly farmers and herders. These may sometimes take the form of self-defense groups, as in the Dogon region of Mali (Poudiougou, 2024; Tor & Ba, 2021), or involve rallies, alliances, counter-alliances, and alignments. Thus, conflicts, due to their social nature, become territorialized, shift, and expand in scale as their centers of action change. These territorial alliances, which characterize conflicts over agricultural or pastoral land, are described by Audouin & Gonin (2014, p. 3) in southern Burkina Faso.

Furthermore, the pressures exerted on herders and the occupation of former fallow land as grazing land or cattle trails without the landowners' consent represent forms or territorial expressions of one group's control over another. These power dynamics surrounding access to, use of, and control over land or natural resources are also reflected in discourse through terms such as "foreigners," "natives," "this is our land," and "we also need land for our animals." Indeed, herders are often stigmatized as outsiders, unlike indigenous farmers. As in Mali (Tor & Ba, 2018, 2024), this reflects a transposition of land-based power relations into the arena of agro-pastoral conflicts.

In contrast to our field findings, studies by Tor & Ba (2009) and Cold-Ravnkilde & Ba (2022) in Mali argue that terrorist incursions provide opportunities for armed groups to restore power to pastoral leaders, giving them control over land, resources, and people. Some authors, such as Tor & Ba (2018, 2024), add that social crises, dispossession, and the eviction of herders from their lands by farmers are contributing factors to terrorist attacks, which appear more akin to attempts to reclaim pastoral lands lost by herders. Grünwald (2023), for his part, explains the emergence of radical or terrorist groups in the Sahel region of Africa as a result of power struggles over territory. According to Sougnabe (2002), the management of natural resources and space characterizes conflicts between farmers and herders.

These conflicts, by virtue of their diversity and nature, place the power dynamics employed by each group to access natural resources at the heart of the analysis of agro-pastoral conflict typologies within the research context. The race for agricultural and pastoral land involves a diverse range of actors—young and old, indigenous and migrant (of all generations), farmers and herders, men and women—engaged in competition and rivalry, sometimes muted, sometimes violent, all acting in the name of the interests of one side or the other. These struggles or claims for access to natural resources (Kull, 2012, p. 6), also referred to as the appropriation of space, are an integral part of political ecology. These appropriations of space are what Gautier & Hautdidier (2012, p. 244) call "territories of practice." Indeed, according to the latter, the repeated (even if seasonal) use of a territory or space for everyday activities such as the exploitation of natural resources (land, water, pasture) leads to territorial claims, appropriation, and, therefore, resistance in all its forms (passive or violent) if these

spaces are threatened. These issues of access to agricultural and pastoral land are transformed into dynamic drivers of conflict (Gonin, 2008; Sokemawu, 2011, p. 56; Nana, 2018; Maiga, 2023).

From Climate Pressure to the Scarcity of Agro-Pastoral Resources: The Role of Climatic Factors in Farmer–Herder Conflicts

Like the forms themselves, the factors driving agro-pastoral conflicts are also diverse, according to field surveys. Table 1, which presents the degree of importance of the factors driving the dynamics of agro-pastoral conflicts, places climatic factors at the top, with a relative importance index of 0.82/1. Indeed, climatic factors, through their sub-factors, are identified in field surveys as key contributors to agro-pastoral conflicts in the research area. Climate change and variability affect the availability of natural resources, contribute to the degradation of farmland, disrupt and stimulate animal life cycles, redefine pastoral routes, encourage the expansion of cultivated fields, and thus lead to conflicts between farmers and herders (Table 1).

Table 1. Index of Relative Importance of Factors Contributing to Agro-Pastoral Conflicts in Bougouriba

Factors	Weight	1	2	3	4	5	Total	Index of factors importance IFI
		Very Low	Low	Medium	High	Very High		
Climate change/Variability	n	3	8	10	31	48	100	0,82
	a	3	16	30	124	240	413	
Infrastructure/development	n	3	12	20	30	35	100	0,76
	a	3	24	60	120	175	382	
Safety and ethnicity	n	15	30	35	10	10	100	0,54
	a	15	60	105	40	50	270	

Source: Fields surveys, 2025, Laboratory work

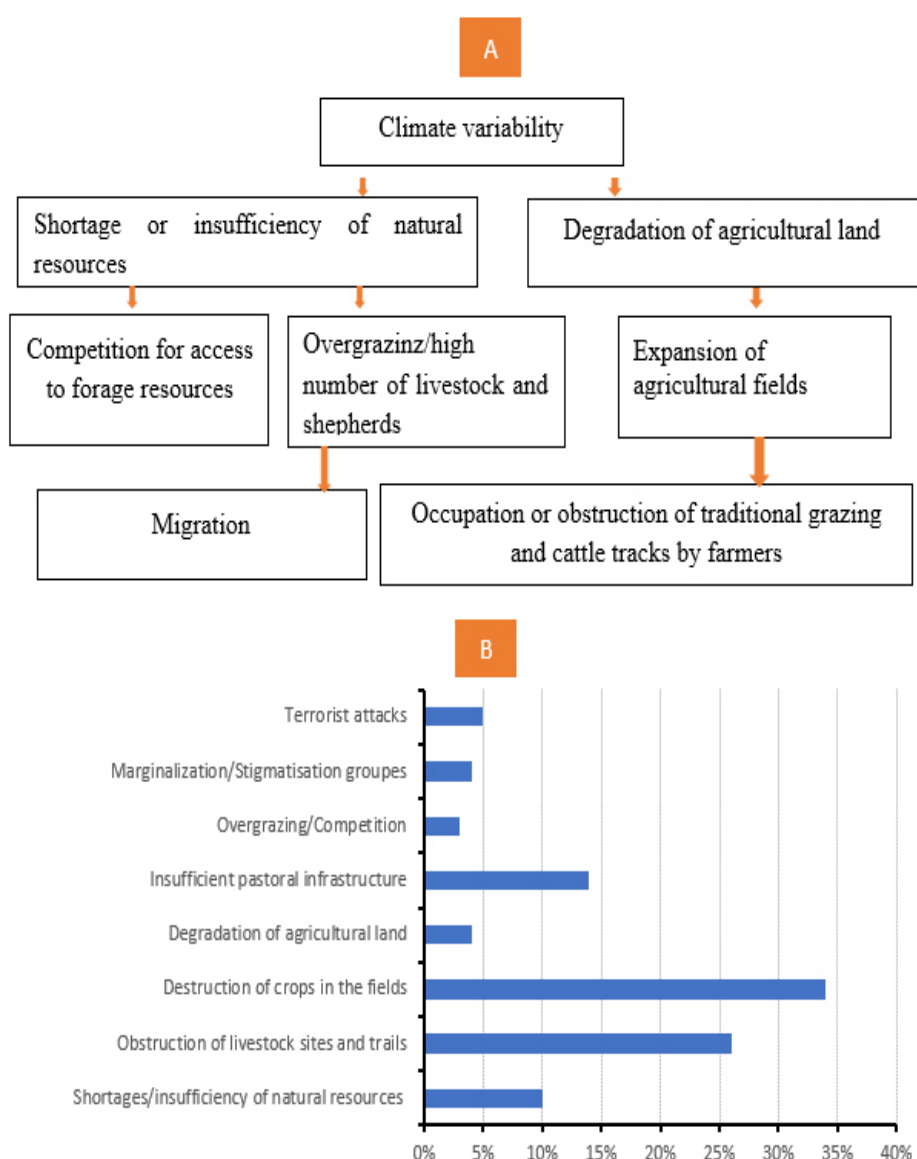
Furthermore, Figure 4A illustrates the causal relationships between climate-related factors and sub-factors in agro-pastoral conflicts, revised based on field observations. The climate-linked drivers of these conflicts include the degradation of farmland (4%); the expansion of cropland and the encroachment upon or obstruction of traditional grazing lands and livestock tracks by farmers (26%, Figure 5A); the gradual degradation of natural resources (10%); competition for fodder resources or overgrazing (3%); and crop destruction resulting from livestock grazing (34%, Figure 5B). These factors thus reflect the wide range of climatic effects on pastoral and agricultural activities.

The progressive depletion of fodder resources for livestock is at the origin of crop destruction by animals. This situation increases pressure on carrying capacity and competition among herders, leading to migration or conflict. On the other hand, with regard to sub-factors, the obstruction of livestock tracks is explained by cropland expansion, which is itself driven by the degradation of farmland linked to climate variability and unsustainable agricultural practices (Figure 4-A), all of which contribute to a decline in forage species. The excerpt from an interview with S. M., a farmer from Diebougou (Kompiela-Wapali), helps to elucidate this situation: “We can’t sow from May or

June anymore (the usual start of the rainy season here in Bougouriba) because the animals might destroy everything... During this time, the plants that the animals eat are very rare because the rains are so infrequent... That is when we don't get along very well with the herders."

Furthermore, this interview excerpt highlights a start of the rainy season characterized by agro-pastoral conflicts driven by climate variability. Using data from the Gaoua station (located in close proximity to Bougouriba), Yaméogo (2024, p. 25) also demonstrated a high degree of variability in the onset of the rainy season across southwestern Burkina Faso.

Figure 4. Tree Diagram Showing Family Tree (A) and Factors Contributing to Agro-Pastoral Conflicts in Bougouriba (B)



Source: Field surveys and laboratory work, 2025

Thus, resource scarcity—particularly with regard to water, useful grazing species, and the progressive decline of soil fertility, explained by erratic weather patterns—increases pressure on land (both

animal and human) and, therefore, heightens tensions between farmers and herders who compete for and converge on the same spaces (Figure 4A) and the same natural resources (Tiamiyu & Yanogo, 2023, p. 129). A similar study conducted in the Tchaourou district of Benin also reveals a progressive disappearance of woody forage species, attributed to cropland expansion (Djohy & Sounon, 2020, p. 17). Climate change and variability thus function as indirect or causal factors that trigger conflicts through their adverse and collateral effects on agricultural and pastoral activities.

Figure 5. Obstruction of Animal Passageways by Crops in Bondigui



Source: Taken by Maiga Y., 2025

The analysis of agro-pastoral conflict factors observed in the study area places the environment and natural resources at the core of the disputes. The increasing scarcity of these natural resources (driven by climate variability and anthropogenic pressure) locks both activities into a vicious cycle of competition. This geographical proximity between the two sectors readily gives rise to conflicts, whether overt or latent in nature (Sénécal, 2005). Space, the primary substrate for both pastoral and agricultural practices, has consequently become a locus of conflict. Figure 4-A illustrates the causal relationships between climatic factors and sub-factors, which, through their impact on agricultural and pastoral activities, give rise to conflict. These factors act as catalysts, triggering conflicts through their effects on pastoral and agricultural activities.

Climatic factors thus shape the rural landscape through deforestation, the destruction of vegetation cover, the reduction of natural pastureland, and the expansion of agricultural land. These analyses corroborate previous studies that identify the indirect role of climate change and variability as triggers of agro-pastoral conflicts (Clionadh & Henrik, 2007; Brown & Crawford, 2010; Devesh & Shanker, 2012; Seiyefa, 2019; Nowag, 2020; Bello & Kazibwe, 2021; Qian et al., 2023). Bontogho (2025), in analyzing the impact of land tenure and land use dynamics on conflicts between farmers and herders in the Pama, Manga, and Ouahigouya regions of Burkina Faso, concludes that the expansion of agri-

cultural land and the mining boom intensify competition for land and are therefore major drivers of conflicts related to pastoralism.

Land Tenure Insecurity, Infrastructure, and Security Challenges: Drivers of Farmer–Herder Conflicts in the Bougouriba Region

Regarding infrastructural and security factors in agro-pastoral conflicts (with importance indices of 0.76/1 and 0.54/1, respectively), these rank second and third. These factors are underpinned by the inadequacy of agro-pastoral infrastructure, which fosters conflict through competition not only between farmers and herders but also among herders themselves.

According to the local livestock administration, the study area comprises approximately twenty pastoral wells, boreholes, and *boulis* or artificial ponds (Figure 6). It also includes a 30-kilometer network of livestock track—currently obstructed by agricultural encroachment and human settlements—as well as 200 hectares of grazing lands spanning Kobja, Mougue, Nabéré, and Nabalê, which are presently undergoing development or rehabilitation³:

...For instance, there are two livestock tracks in Bondigui. The first was developed by the PNGT 2⁴ project, covering a distance of 25 km and connecting Bondigui, Nabéré, and IntiéDougou. The second is a traditional track of about 15 km linking Bondigui, Obro, and Mougué. Unfortunately, everything is obstructed by farm fields, and it is impossible to identify them accurately today because the markers have disappeared some have been torn out (certainly by either farmers or herders).

Interview extract, C. I., Livestock Officer (Bougouriba). In addition, D. K., one of the representatives of the leading livestock farmers in Bougouriba, adds that:

Is it even possible to find animal tracks here that people still respect? Everything is occupied, either by fields or by houses. We try as best we can to pass through with our livestock (in other words, to carve out our own passage track) There were tracks dating back to the revolution of Thomas Sankara that stretched from Houndé all the way here. But today, those animal routes are no longer visible.

These interview excerpts further indicate that traditional tracks, even if they existed in the past, are now largely obstructed and, in some cases, erased from the landscape. This situation contributes significantly to exacerbating tensions between farmers and herders. Furthermore, these obstructions highlight the land tenure insecurity of pastoral sites and routes, which particularly affects pastoral systems and limits herders' and their livestock's access to vital pastoral resources (Banaon, 2016).

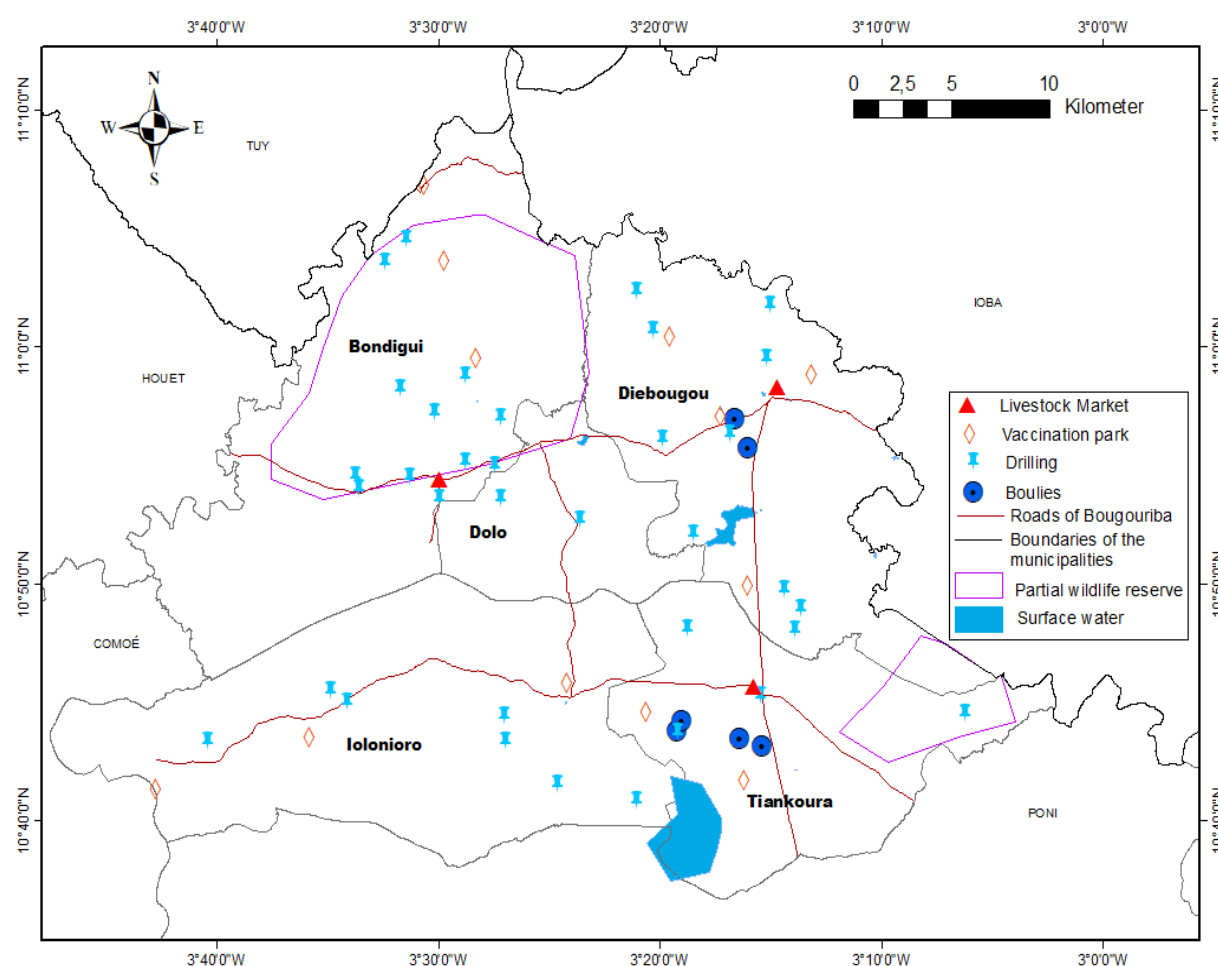
The analysis of the map reveals a geographical area that is nearly devoid of pasture and marketing infrastructure, alongside a critical shortage of livestock trails. Conversely, it indicates an acceptable density of watering and veterinary health facilities (Marivoet & Sall, 2019, p. 8). However, the use

³ These ongoing developments are part of the Regional project to support pastoralism in the Sahel (PRAPS)

⁴ National Land Management Program – Phase II (PNGT2)

of these water supply infrastructures for agricultural, domestic (dishwashing, drinking), fishing, and gold mining purposes threatens their sustainability and their capacity to meet the various agricultural and pastoral needs of the province. This documented absence of agro-pastoral facilities—specifically grazing areas and secured livestock tracks—is attributed, according to field reports, to the prevailing climate of insecurity currently affecting Burkina Faso.

Figure 6. Agro-pastoral Infrastructure in Bougouriba



Source: IGB/BNBT 2012; Marivoet et Sall, 2019; Prafts-BF2, 2021; Field data 2025;

MAIGA Yaya December 2025

In fact, the presence of terrorist camps in forests and wooded areas has, in some cases, slowed the development of grazing areas in the province under study, as evidenced by this excerpt from an interview with C. I., a livestock officer in Bougouriba: “In reality, the PRAPS project intended to rehabilitate approximately 2,000 hectares of grazing land within the Nabéré forest area; however, due to the security context, the project’s ambitions were revised.” This limited coverage of agro-pastoral infrastructure in the study area can also be explained by the agricultural orientation of the South-Sudanese zone of Burkina Faso and, consequently, by the prioritization of development projects toward agricultural activities.

Indeed, development policies in the study area appear to favor agriculture over livestock farming, thereby marginalizing the pastoral sector, as evidenced by the limited coverage of the provincial

territory by grazing areas and the near absence of livestock trails. Interview excerpts such as “the authorities’ failure to establish breeding programs or livestock reserves; lack of livestock trails; delays in developing grazing sites; problems with watering sites for animals; etc.”—highlighted by nearly all herders—also reveal the infrastructure-related problems in the study area that contribute to conflicts between herders and farmers. As for farmers, although they recognize the need for grazing sites (as temporary or occasional herders or small-scale livestock keepers), they remain concerned and hesitant because their primary activity is farming.

The lack of adequate watering infrastructure (surface water or artificial water sources) in the province does not facilitate the storage of rainwater for the benefit of agro-pastoralists. Without opposing the demarcation of classified or managed forests, one may ask how it is possible that such sites exist or are planned by decision-makers, yet livestock reserves are absent in the study area. The recorded migration of Fulani herders to the commune of Diébougou (due to the national security situation) has also contributed to exposing the infrastructure crisis facing Bougouriba. According to field reports, internally displaced Fulani herders have, in response, transported their livestock to Côte d’Ivoire, Galgouli, and Bâtié.

This infrastructure crisis is further exacerbated by a local land tenure system that is more agricultural than pastoral. Indeed, local or customary land governance is dominated primarily by indigenous populations and native farmers, who are the landowners. These include the first occupants and the first waves of migrant farmers. Pastoral lands, as well as sites of existing or planned agro-pastoral development, are mostly negotiated with these indigenous and native farmers, who are the custodians of land, local authority, and ritual practices. It is also these communities that temporarily or occasionally host migrant Fulani herders, offering them land for settlement in the form of farming hamlets when conditions are favorable for the sharing of natural resources.

Thus, in the name of customary authority and land rights, sites traditionally used for grazing are being converted into settlements or exploited for agro-sylvo-pastoral activities by relatively wealthy individuals who have negotiated or purchased land from landowners. The interview excerpt below further illustrates this emerging dynamic of precariousness in pastoral lands—the few remaining traditional grazing sites that struggle to persist amid increasing human pressure and growing demand for land for various uses (housing, commerce, agro-sylvo-pastoral activities, etc.): “As far as I know, grazing land is very scarce here these days; everything is in the process of being titled (titling or demarcation), and all the land is now used for farms (mostly agricultural). The Diebougou–Gaoua road used to be used for grazing, but now it’s all farms and homes...” (Excerpt from an interview with a livestock farmers’ leader, Diebougou).

The same applies to traditional livestock trails, whether established through negotiation or developed by the authorities; they rarely persist in the landscape, as they are blocked by crops or fall victim to the actions of individuals—often farmers and landowners—who remove the markers or signposts delineating these routes. This land tenure dynamic also explains the occupation of lowland areas or natural surface water sites by vegetable crops, especially during the dry season, which are

used by herders as fallback sites in search of water for their herds. All of this reflects a local land power structure dominated by agriculture rather than pastoralism.

Beyond conflicts between herders and farmers, local land governance can also be a source of disputes between indigenous and migrant farmers, between gold miners and farmers, or even within the same groups, as illustrated by the land dispute that broke out in 2018 between an indigenous farmer (Lobi) and Moossé migrants in Toména (Iolonioro).

According to Grünewald (2023, p. 13), the absence of agro-pastoral infrastructure in certain areas, its underdevelopment, or its deterioration in others are additional factors contributing to conflict. Similarly, Gonin and Gautier (2015, p. 2), through an analysis of political discourse and official reports dating back to the colonial era, followed by field research, demonstrated the territorial marginalization of herders in western Burkina Faso. Daré (2016, p. 10), for his part, identified the lack of water sources and access routes to water and forage as constraints on agro-pastoralism in the Bougouriba sub-basin, which may escalate into violent conflicts. Furthermore, the study by Thor et al. (2025) demonstrates the contribution of pastoral infrastructure (particularly demarcated pastoral zones) to conflict prevention in the Sondré-Est pastoral zone in Burkina Faso. Indeed, they report a symbiotic relationship and cooperation between these two groups following the implementation of pastoral intensification methods by herders in that zone. However, Gonin A. and Gautier (2015, p. 8) argue that this resolves only part of farmer–herder conflicts, as these livestock policies favor sedentary livestock systems at the expense of transhumance or large-scale pastoralism.

Furthermore, the security situation is believed to have contributed to a deterioration in the social climate between herders and farmers through the emergence and intensification of mistrust, isolation, and reservation between the two groups. Alliances are now forming within the same communities, taking the form of groups and subgroups willing to defend their own members, which does not facilitate the resolution of incidents (such as herds grazing in farmers' fields, shootings, or the poisoning of animals by farmers) that may escalate into violent conflicts.

This sense of mistrust or defiance is also fueled by the lingering effects of past incidents that did not favor one of the two groups, as indicated in this excerpt from an interview with K.M., a farmer from Bondigui: “For example, some Fulani’s animals wandered into my field; we took the matter to the prefect, but I didn’t like the way it was handled.” Furthermore, these shared alignments may be interpreted as forms of inter-ethnic solidarity, characterized by a retreat into identity and kinship. These dynamics are also shaped by notions of indigeneity, outsiders, and migrants. According to Ogu (2022), the interplay between citizenship, ethnicity, and marginalization plays a crucial role in shaping conflicts between farmers and herders. Hellendorff (2012) adds that the environment is only one of several factors exacerbating tensions, alongside socioeconomic and, above all, political factors. Bello & Kazibwe (2021), for their part, also identify ethnic and religious factors as drivers of agro-pastoral conflicts.

Thus, in addition to the climatic variability that already undermines these two activities by paving the way for increased competition, there is a national and local security context that affects the social

climate and also hinders the development of pastoral infrastructure. Furthermore, these analyses further corroborate environmental and climatic determinism (natural, environmental, and climatic constraints, or the scarcity of forage, land, and water resources, as well as floods) and socio-political factors (including insecurity and agro-pastoral policies). These elements are increasingly highlighted by proponents of political ecology approaches (Gautier & Tor, 2012). Natural resources (water, land, pasture), when linked to human activities such as livestock raising and agriculture in an environment characterized by a variable climate that negatively impacts these activities, create intense competition over these resources. These natural resources thus become the subject of conflict, triggering competition among stakeholders.

Climate variability thus intertwines with crises of inequality and pre-existing socio-spatial divisions between Fulani herders (labeled as foreigners or migrants) and indigenous or first-generation farmers. Understanding the contestation of inequalities, marginalization, and injustices related to access to and control over natural resources is therefore the strength of political ecology analysis, according to Tschakert (2012). Several other sources (Djohy & Sounon, 2020; Bone et al., 2024) present all the aforementioned motives as drivers of rivalry between farmers and herders. Furthermore, Tor & Ba (2018 and 2024) explain conflicts between farmers and herders in Mali using approaches rooted in political ecology, emphasizing the disastrous consequences of environmental and biodiversity degradation under the impact of climate change and variability.

Additionally, agro-pastoral policies have long marginalized and discriminated against pastoral activities (Bonnet, 2013). Combined with population growth and ecological crises, the fluctuating role of the State—manifested through modest pastoral infrastructure development (Thébaud & Batterbury, 2001)—has contributed to the isolation and precariousness of pastoralism, as well as the degradation of existing facilities such as wells and boreholes (Habibou et al., 2018). This disparity in development policies between agriculture and livestock farming induces vulnerabilities within the pastoral sector, creating sources of conflict. Indeed, the flourishing and development of western and southwestern Burkina Faso are largely attributable to these public agricultural policies (Ouédraogo, 1986; Gonin, 2014, p. 35).

CONCLUSIONS

This study highlights a diversity of agro-pastoral conflicts within the research area. Although these conflicts are all inherently linked to agricultural and livestock activities, they differ in nature and manifestation. They encompass subtle or less violent forms (insults, taunting, stereotyping, stigmatization, and threats) as well as violent and overt manifestations (evictions and persecution of herders, crises or open threats of confrontation during crop raiding by livestock, sorcery, and cases of livestock poisoning). These conflicts stem from the repercussions of climate change and variability on agricultural and pastoral activities, the limited spatial coverage of agro-pastoral infrastructure, and the security context at both the national level (since 2015) and the local level (between 2018 and 2022).

The analysis of the drivers of agro-pastoral conflict in the study area thus places the environment and natural resources at the core of these tensions. Furthermore, socio-political dynamics—manifested by the current security crisis and the scarcity of pastoral development policies—provide a framework for understanding the ongoing conflicts between farmers and herders. These issues have a greater impact on the livestock-raising community because, in addition to the climatic crises that are certainly undermining these two activities, there are risks of marginalization and the expropriation of pastoral lands or farming hamlets that were historically negotiated with indigenous farmers and landowners.

In the current context of climatic variability and security crises, the recorded agro-pastoral conflicts stimulate the migration of herders and livestock mobility toward neighboring countries (Côte d’Ivoire and Ghana) and other provinces within Burkina Faso (Poni, Nounbiel, Ioba, Sissili, and Cascades). Furthermore, these tensions trigger internal movements toward refuge sites—such as mountain ranges, wooded or forested areas, urban lowlands, and the rivers and watercourses of the Bougouriba province—particularly during the peak cropping season. These dynamics disrupt the agricultural landscape through the unplanned expansion of cultivated fields.

In the process of resolving agro-pastoral conflicts, stakeholders engage a diverse range of actors and institutions. These include support from farmer and herder leaders, as well as technical assistance from agricultural and livestock extension agents. Furthermore, defense and security forces—specifically the Police, Gendarmerie, and Forestry Service—are involved alongside administrative and customary authorities, such as the Special Delegations (PDS) and Village Development Councils (CVD). Recourse is also made to the formal judicial system through the Dieboungou High Court (Tribunal de Grande Instance). These entities are mobilized based on the nature and intensity of the conflict, as well as the interests and objectives of the complainants. This behavior often reflects a strategy of “forum shopping”—for instance, a herder injured by a farmer would be more inclined to report the matter to the police rather than seeking mediation through the Village Development Council (CVD).

Consequently, stakeholders are encouraged to prioritize endogenous and traditional mechanisms—such as customary authorities or Village Development Councils (CVD)—to achieve amicable settlements. The second tier involves the Prefecture (represented by the Special Delegation/PDS), which may commission agricultural or livestock extension agents to conduct formal damage assessments and propose technical solutions. Should these fail, defense forces are engaged to ensure security, with the modern judicial system serving as the final recourse for legal enforcement. This tiered approach facilitates the rapid internal resolution of moderate disputes while simultaneously addressing the challenges posed by the geographical distance of state institutions in remote localities.

In the field of conflict management, given that proactive intervention constitutes the most effective strategy, the government—through the ministries responsible for agriculture, livestock, and the environment—should prioritize developing conservation strategies for high-palatability forage species currently threatened by climatic extremes. Furthermore, emphasis should be placed on the development of pastoral infrastructure (particularly grazing reserves) and the establishment of secured livestock tracks.

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Youth Festival Life Cycles and Their Impact on Accommodation Demand: The Case of Hungary

ABSTRACT

The study aims to analyse the developmental trajectories of Hungary's market-leading youth and university music festivals—the National Touristic Meeting of University and College Students (EFOTT), the Szegedi Youth Days (SZIN), and the Campus Festival (Campus)—as well as their impact on the tourist accommodation sectors of their respective host settlements (Sukoró, Szeged, and Debrecen). The applied methodology combines trend analysis based on secondary sources with a statistical examination of guest turnover data (number of guests and overnight stays) from the Hungarian Central Statistical Office (KSH) for the period 2021–2025. The primary finding of the research is that, although the investigated festivals—unlike major international events—demonstrated strong resilience and stable attendance figures following the COVID-19 pandemic, this success is hardly, if at all, reflected in accommodation turnover. The impact of festivals held in major cities on local accommodation is statistically insignificant, while the effect of EFOTT, held at Lake Velence, is primarily local and relatively modest in absolute terms, albeit with spillover effects on surrounding settlements.

Keywords: festival tourism, guest turnover, life cycle, university, youth

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INTRODUCTION

The primary target audience of popular music festivals consists of young adults and individuals in the 14–18 age group, who perceive participation primarily as a social event, a cultural experience, and a form of recreation (Robertson et al., 2015); for younger attendees, these events also serve as venues for socialisation and networking (Kinnunen et al., 2020; Quinn et al., 2025). Given their age, many are university students who view music festivals as a form of entertainment alongside their studies, often linked to their respective university towns.

In the Hungarian festival market, university and youth events were typically local or regional for a long time; however, following the turn of the millennium, several have evolved into attractions with national or international appeal. The expansion of the festival-goer base is due, on the one hand, to the increasing accessibility of higher education for a growing segment of youth, which has elevated university social life and entertainment to a new level (Bácsné Bába, 2014). On the other hand, festival management has adopted market-based operations—similar to those of leading Hungarian festivals (Sziget Festival, Balaton Sound, VOLT Festival)—while maintaining their specific profile as university and youth events.

Among numerous festivals, three have followed extraordinary developmental trajectories: the National Touristic Meeting of University and College Students (EFOTT) (Fenyves et al., 2019), the Szeged Youth Days (SZIN) (Süli & Martyin-Csamangó, 2017), and the Campus Festival in Debrecen (Bácsné Bába, 2014; Fenyves et al., 2020), which now each attract over 100,000 visitors annually. Due to these attendance figures, the latter two have become prominent mid-sized attractions at both domestic and international levels, functioning as significant tourism draws for their host settlements. While SZIN and Campus are tied to specific cities, EFOTT—the most significant event targeting university students—operated as a peripatetic (itinerant) festival from its founding in 1976 until it found a permanent home on the shores of Lake Velence in 2015. These events have essentially become flagship tourism programmes in their host settlements, owing to the volume of visitors mobilised, the resulting expenditures, and their multiplier effects.

The present research seeks to address a research gap, as domestic scholars have thus far paid limited attention to these expanded youth and university festivals. It is also noteworthy that no comparative analysis has yet been conducted regarding these festivals or their impact on the guest turnover of the host settlements; these three prominent representatives of the Hungarian festival market have mostly been analysed only in theses and dissertations.

Before defining the research objectives, it is necessary to clarify what is meant by “tourism impact” in this study. The tourism impacts of festivals can be interpreted across multiple dimensions: these may include the local effects of festival-goer spending, image and awareness effects, attractiveness as event tourism, and impacts on commercial accommodation turnover. Due to the nature of the available data, this study—beyond analysing numerical visitor data—focuses primarily on the latter: the impact on accommodation turnover, measured using monthly accommodation statistics derived

from the KSH/NTAK (Hungarian Central Statistical Office/National Tourism Data Reporting Center) databases. Consequently, the study's conclusions are valid exclusively within the dimension of accommodation impacts and cannot be extrapolated to the overall tourism or economic role of the festivals. Other impact dimensions—particularly consumption by local visitors, image building, or non-registered forms of accommodation—cannot be captured with the current methodology; therefore, the study does not make substantive findings regarding these aspects. Based on the above, the following research objectives have been formulated:

1. To examine the developmental trajectories and characteristics of EFOTT, SZIN, and the Campus Festival as tourism products;
2. To analyse the impact of these events on the tourism of their host destinations, primarily based on available accommodation data;
3. To investigate, using accommodation data as a basis, how these festivals influence the seasonality of tourism in the host destinations.

LITERATURE REVIEW

Categorization and Significance of the International Music Festival Market

Festival tourism is a defining form of international travel and leisure, distinguished by its diversity and various methods of classification. According to Davies (2020), festivals can be categorized into indoor and outdoor events, by organisational structure (public, private, and non-profit), and based on type, size, or attractiveness. Newbold and Jordan (2016) further distinguish between global, diasporic, and festivals with local cultural or religious roots. In some cases, unique festivals serve as flagships for their host settlements, attracting hundreds of thousands of visitors.

The scale of a festival is most fundamentally determined by attendance figures. Based on visitor numbers alone, popular music festivals are among the most sought-after types, with the largest events exceeding half a million attendees (e.g., Coachella, Tomorrowland, Sziget). These are internationally recognised events primarily frequented by foreign tourists. The second tier includes festivals attracting domestic and international audiences of approximately 100,000 to 200,000 (e.g., VOLT, EXIT) (Pavlukovic et al., 2020), followed by those of regional significance (e.g., Fishing on Orfű) (Oroszi et al., 2018), and finally, festivals of local importance, which possess negligible tourism appeal.

Festivals can also be categorized by venue: they may be hosted by capital cities (Budapest – Sziget), large cities (Antwerp – Tomorrowland), medium-sized cities (Sopron – VOLT), or even small towns (Zamárdi) and micro-regions (Varga et al., 2025a). Depending on the size of the settlement, festival visitors may play a cardinal role in shaping tourism accommodation indicators (Varga et al., 2024). During the summer season, waterfront music festivals are particularly popular, offering memorable experiences through programmes integrated into the natural environment (e.g., Montreux Jazz Festival, Balaton Sound, Fishing on Orfű, Bánkitó).

A further classification can be based on musical genre. There are complex events with mixed offerings, whose success stems from the simultaneous presence of various genres (Coachella, Glastonbury, Sziget), contrasted with niche festivals focusing on specific genres, such as electronic music (Tomorrowland, Balaton Sound), jazz (Montreux Jazz Festival), or rock (Rockmaraton).

The significance of popular music festivals lies in their ability to mobilise large crowds, contribute to a settlement's brand awareness and economic revenue, and serve as a travel motivation for youth. According to Pegg and Patterson (2010), the young audience of these festivals develops a long-term commitment to the host location. Consequently, festival studies have primarily examined economic (Paleo & Wijnberg, 2006), social (Bácsné Bába, 2014), and environmental impacts. However, analyses of visitor motivation (Dunne et al., 2023), satisfaction (Hinek & Papp-Váry, 2024; Varga et al., 2025b), technological shifts (Robertson et al., 2015), and sustainability (Ásványi & Jászberényi, 2017; Lőrincz et al., 2022; 2023), as well as sustainable urban development (Nagy-Szijártó & Szalmáné, 2023), are also frequent. Varga et al. (2025b) found that university graduates are generally more satisfied and demonstrate a higher demand for supplementary cultural programmes, allowing festivals with complex offerings to attract a more diverse visitor base.

At the beginning of the decade, the dynamic growth of festival tourism was halted by the pandemic, impacting the survival of the entire sector and leading to the collapse of numerous businesses (Kinnunen & Honkanen, 2021; Rothschild et al., 2020). This coincided with shifting trends in international musical tastes, which significantly influenced attendance at certain festivals (Nunes & Birdsall, 2021). During COVID-19, established festivals sought opportunities for a comeback, which most achieved; thus, festival tourism remains a cornerstone of international tourism (Drummond, 2022; Su et al., 2024). Research by the latter authors suggests that youth interest in and demand for outdoor music festivals have been rebuilt, resulting in a post-pandemic resurgence of mass-attendance events. Conversely, negative examples exist where previously successful, decades-long festivals were forced to close (Drummond, 2022). In this turbulent period, analysing the specific category of multi-day events organised explicitly for youth and university students is of particular interest.

The Tourism Role of Hungarian Youth and University Festivals

Following international trends, significant changes occurred in the Hungarian popular music scene during the 1960s and 1970s, with the formation of numerous bands and an increased demand for live music (Buzinkay, 2012). The oldest music festivals began as youth events well before the regime change, aiming to provide entertainment for the youth of that era (Bácsné Bába, 2014). Although most early festivals ceased or were transformed, this study focuses on two “legal successors” and a third, later-founded festival, examining their impact on local tourism. The Szeged Youth Carnival (founded in 1964 and known as Szeged Youth Days – SZIN since 1968) and the National Touristic Meeting of University and College Students (EFOTT), established in 1976, survived the regime change and remain among the most well-known and popular music festivals today (Bácsné Bába, 2014; Fenyves

et al., 2019). They were later joined by the Campus Festival, established in 2002 (adopting its current name in 2007) (Bácsné Bába, 2014).

The general appreciation of festival tourism after the millennium is highlighted by the fact that 2010 was declared the “Year of Festivals” by the former Hungarian Tourism Plc., turning events based on Hungarian culture and tradition into a national marketing campaign. Domestic research linked to this thematic year compared Balaton Sound and VOLT Festival (Indra, 2009), while Sija and Schauer mann (2009) analysed the attendance habits of the 15–25 age group, although neither study focused on the youth–university festivals central to the present research. The latter study emphasised the high level of awareness of music events among young festival-goers; out of thirteen festivals surveyed, eight belonged to this category. Awareness followed a descending order: Sziget, VOLT, Balaton Sound, Hegyalja, Coke Club, EFOTT, Rockmaraton, and SZIN. This confirms that awareness of university-specific festivals is correlated with educational attainment; nearly three times as many graduates had heard of EFOTT compared to those without a high school diploma. This high level of awareness has made Hungarian popular music festivals a prominent area of research, with most publications focusing on Sziget (Hinek, 2021; Hinek & Kulcsár, 2019; Hinek & Papp-Váry, 2024; Indra, 2009; Iványi & Bíró-Szigeti, 2021; Kovács, 2009). However, due to differences in organisational structure, these flagship festivals are not directly comparable to youth-focused events.

Research concentrating on university festivals is limited, with significant gaps in guest turnover analysis. Nevertheless, Szabó and Závodi (2018) concluded that a stable festival portfolio contributes integrally to the growth of tourism in Szeged. Of the 51 festivals in 2017, three were popular music events with national reach, with SZIN notably closing the national summer festival season. For a comprehensive overview, the analysis of the “sharing economy” (P2P accommodation) is indispensable due to the price sensitivity of the youth demographic (Einav et al., 2016). Finally, the impact of festivals on the seasonality of host settlements is examined using the Gini index (Gini, 1912), a crucial factor for success, given that outdoor events are highly weather-dependent (Csapó & Végi, 2023).

METHODS

The study is based on a complex methodological approach combining quantitative and qualitative elements, applied by the authors in three steps within the following causal framework:

- A literature review, during which recent international and Hungarian academic articles and studies were examined.
- Selection of the units of analysis and determination of the characteristics and market positioning of the chosen festivals based on attendance data reported by organisers and various media platforms.
- Analysis of the festivals’ impacts on the tourism of the host destinations, based on tourism accommodation data available from the Hungarian Central Statistical Office (KSH).

In the first phase of the study, the most significant Hungarian and international publications on festival tourism were collected and analysed according to thematic aspects, with a particular focus on major events targeting youth audiences.

In the second phase, Hungarian university and youth festivals were surveyed in terms of their supply structure and visitor volume. Based on these criteria, the “target group” of the present study was selected, comprising three festivals: the National Touristic Meeting of University and College Students (EFOTT), the Szeged Youth Days (SZIN), and the Campus Festival in Debrecen. The selection methodology was twofold: first, the event had to possess a complex, multifaceted offering rather than serve a niche musical genre; second, it had to reach an annual attendance volume of 100,000 visitors. In the festival tourism market, this magnitude represents events that are well known and attended at a national level. The festivals’ performance indicators were gathered from secondary sources (articles, interviews, and press releases published in various media).

In the third step of the research, the impacts of the investigated festivals were identified within the host settlements and, where justified, at a broader destination level. Methodologically, guest turnover indicators for tourist accommodation—sourced from the Dissemination Database of the Hungarian Central Statistical Office (KSH)—were subjected to time-series and comparative analyses.

The investigation covers a five-year period (2021–2025). The methodological rationale for this timeframe is that, since 2021, monthly time-series data have been available at the settlement level for private and other types of accommodation, in addition to commercial establishments. The use of accommodation guest turnover data as the primary indicator is justified by several factors: these data are uniformly available in monthly breakdowns at the settlement level from the KSH/NTAK database, thus enabling temporal and spatial comparisons across the three festivals. However, it is important to note that this indicator has limited sensitivity in measuring the tourism impacts of university and youth festivals—a point that our results also emphatically highlight.

This study intentionally limits the investigation of impacts to tourism accommodation turnover and the three largest youth/university festivals. Accordingly, the results reflect impacts on these specific types of turnover and pertain exclusively to figures appearing in official statistics. They do not account for the impact of non-registered accommodation, which may be significant for the youth target group.

The findings are valid for the investigated period of 2021–2025, during which the locations and structures of the festivals remained stable. These results cannot be extrapolated to earlier or later periods, as similarly detailed data are not available for those timeframes. To more accurately map the motivations behind the statistical data and hidden turnover, future research involving qualitative, in-depth interviews with festival organisers is justified in order to further explore impact mechanisms and refine these findings.

RESULTS

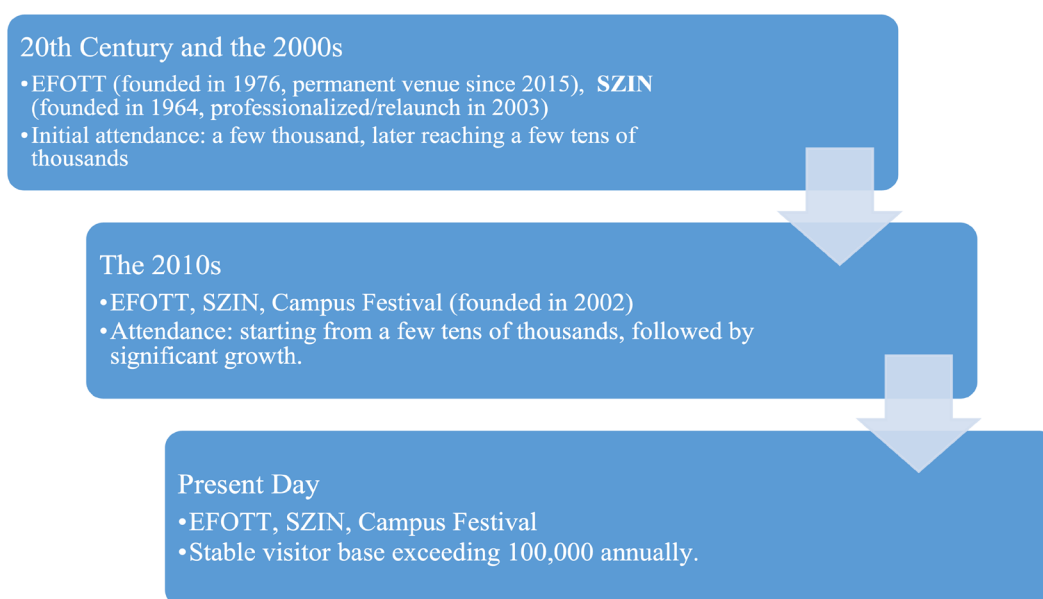
Developmental Trajectories of University and Youth Festivals

In Hungary, numerous university and youth festivals are organised annually. A significant proportion is still directly managed by universities (e.g., Pécs University Days, Szeged University Days), while others are typically organised at the municipal or city level (e.g., Szeged Youth Days). Their common characteristic is that they are generally popular music festivals specifically targeting young age groups, with both their marketing activities and performer line-ups tailored accordingly. While their organisation shows similarities to major, prominent music festivals (e.g., Sziget Festival, Balaton Sound), they differ in maintaining young demographics as their primary target audience.

Nearly every major higher education institution in the Hungarian festival market has a related event of varying scale (e.g., University of Pécs: Pécs University Days; Budapest University of Technology and Economics: BME University Days; University of Miskolc: Miskolc University Days; Eötvös Loránd University: Lágymányosi Eötvös Days). However, their scope is typically limited to the respective university, settlement, or region. This is a natural consequence of their primary function: providing entertainment and experiences for the youth of a specific institution or town. Consequently, attendance ranges from a few thousand at smaller events to a few tens of thousands at larger ones.

Three festivals constitute an exception at the national level, having become market leaders within the youth/university category: the National Touristic Meeting of University and College Students (EFOTT), the Szeged Youth Days (SZIN), and the Campus Festival in Debrecen. The developmental trajectory of these festivals can be divided into three stages (Figure 1).

Figure 1. Developmental Stages of the Analysed Festivals

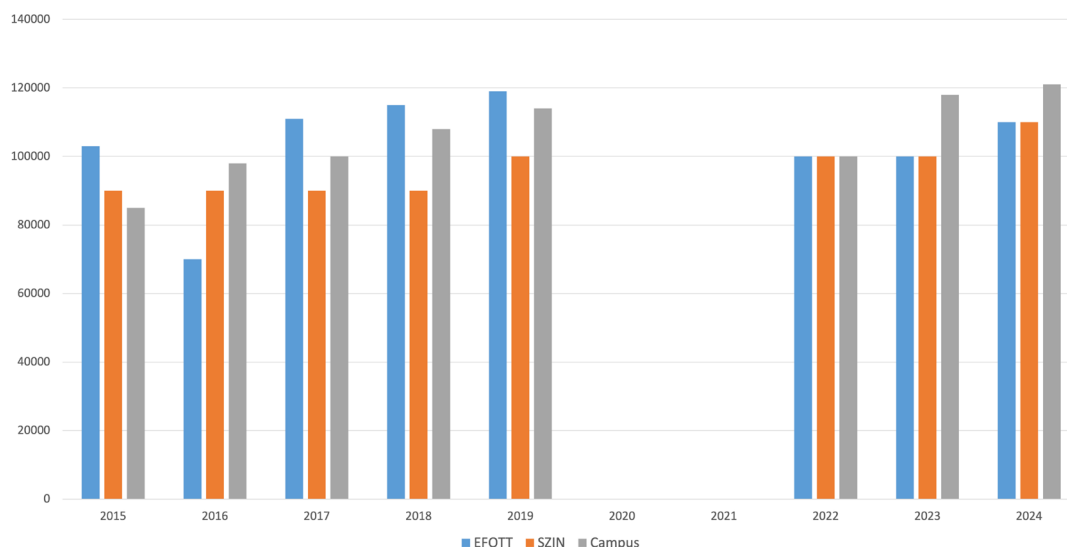


Source: Data published by festival organisers and media reports

SZIN and EFOTT were founded in the second half of the 20th century (1964 and 1976, respectively), while the Campus Festival was established in 2002 (under the name Vekeri-tó Festival). The first developmental stage—lasting until the 2010s—spanned decades for the former two and only a few years for the latter. Key characteristics of this period include the pioneering role of SZIN and EFOTT in the Hungarian festival market, although they benefited only marginally from this in the period immediately following the regime change. This is evidenced by the fact that in the 1990s and 2000s, along with many other university/youth events, they maintained a smaller audience of a few tens of thousands annually.

The Hungarian festival market underwent significant development in the 2010s; attendance at Sziget Festival exceeded 500,000 annually, while Balaton Sound and VOLT Festival reached 150,000, placing them among Europe’s largest festivals. The professionalisation of the investigated events also took place during this period (Stage 2). Organisers continuously expanded the three youth festivals following the model of market-leading events, both by booking major international performers and significantly broadening their service offerings. As a result, all three festivals reached the “100,000-visitor” threshold by the late 2010s (Figure 2), becoming defining tourism attractions and cultural-music festivals for their respective settlements.

Figure 2. Guest Turnover of the Analysed Festivals

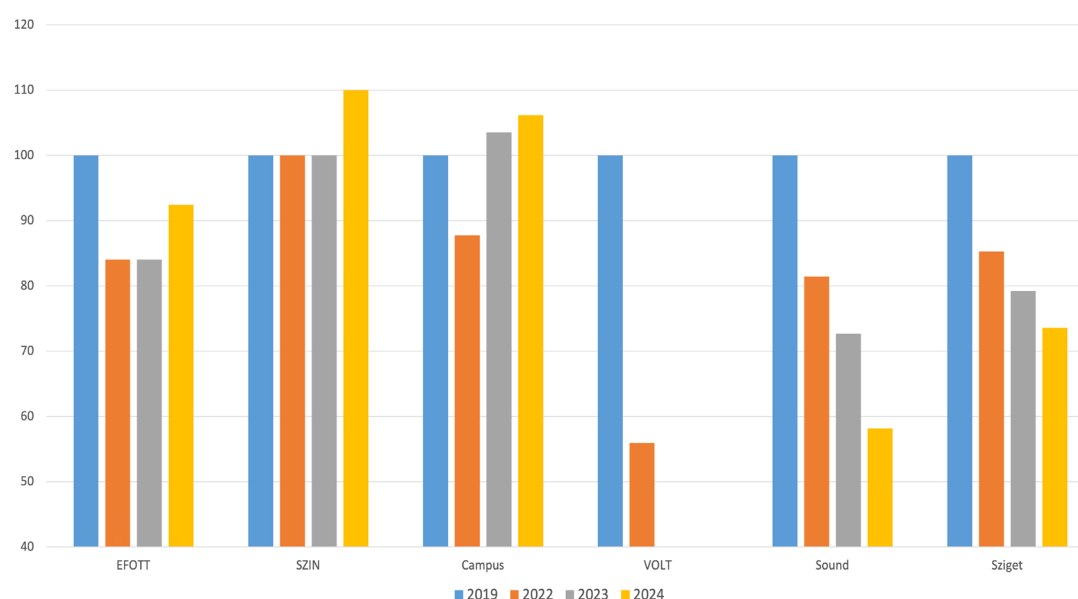


Source: Data published by festival organisers and media reports

The third stage encompasses the COVID-19 pandemic and the subsequent period. Events were cancelled in 2020 due to the pandemic and were held with restrictions in 2021 (typically requiring COVID-19 immunity certificates); therefore, these years were excluded from the analysis. From 2022 onwards, visitors could attend without restrictions, and as shown in the figure, all three festivals demonstrate continuity in attendance. Each investigated event maintained an attendance level exceeding 100,000 in the post-pandemic years, and by 2024, they even showed growth (EFOTT and SZIN: 110,000; Campus Festival: 120,000).

Another important characteristic of the investigated university and youth festivals is their high level of resilience. Their recovery indicators following the COVID-19 pandemic were significantly stronger than those of Hungary’s flagship, market-leading festivals. Using 2019—the last pre-pandemic year—as the base year, market-leading festivals showed a significant decline, whereas no such decrease was observed for the events examined in this study (Figure 3).

Figure 3. Change in Guest Turnover of the Analysed Festivals Compared to the 2019 Base Year (%)



Source: Data published by festival organisers and media reports

Following the pandemic, the festival market changed significantly due to several factors: increased production costs (higher artist fees, energy prices, rental fees, etc.), significant inflation in Hungary, and declining discretionary income on the consumer side. Consequently, a substantial drop was observed in the consumption—primarily domestic—of market-leading festivals. As a result, the VOLT Festival ceased after 2022, Balaton Sound after 2024, and the Sziget Festival recorded 416,000 attendees in 2025, falling far short of its pre-COVID volume of over 500,000.

In contrast, the smaller and more flexibly organised university and youth festivals, owing to their higher resilience, were better able to respond to these changes. As demonstrated, they not only avoided decline but were also able to increase their visitor numbers by 2024.

Impacts of University and Youth Festivals on Accommodation Turnover

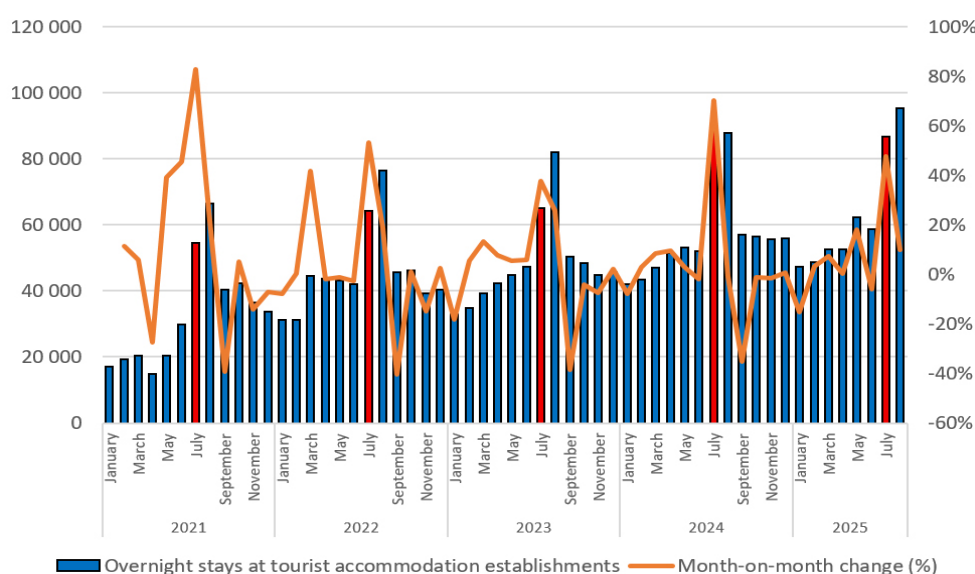
To evaluate the impact of festivals, we analysed the effect of the three highlighted youth festivals (Campus, SZIN, EFOTT) on accommodation turnover based on tourism accommodation data for the 2021–2025 period. The limitation of the investigation period was intentional; the rationale for this restriction is that monthly data for private and other types of accommodation have been available since 2021, whereas in previous years, such data were only accessible for commercial accommodation.

Given that visitors to university and youth festivals primarily seek low-cost accommodation—where private and “other” types represent a significant share—we examined the dataset and period in which all accommodation types were consistently available for each month.

The analysis was primarily conducted through time-series and comparative analyses, focusing specifically on the months in which the respective festivals took place (EFOTT: first half of July; Campus Festival: second half of July; SZIN: late August).

The most significant finding of the study—which somewhat contradicts our preliminary expectations—is that none of the investigated festivals shows a substantively identifiable impact on accommodation turnover. In most cases, the turnover data for the festival months either do not stand out from the natural seasonal peaks characteristic of the region (this is particularly striking in the case of Lake Velence) or—in the case of major urban venues (Debrecen, Szeged)—the potential impact of the event is absorbed within the total accommodation turnover of the settlement and does not generate a detectable surplus.

Figure 4. Development of Overnight Stays in Debrecen's Tourist Accommodations, Highlighting the Month of the Campus Festival (July)



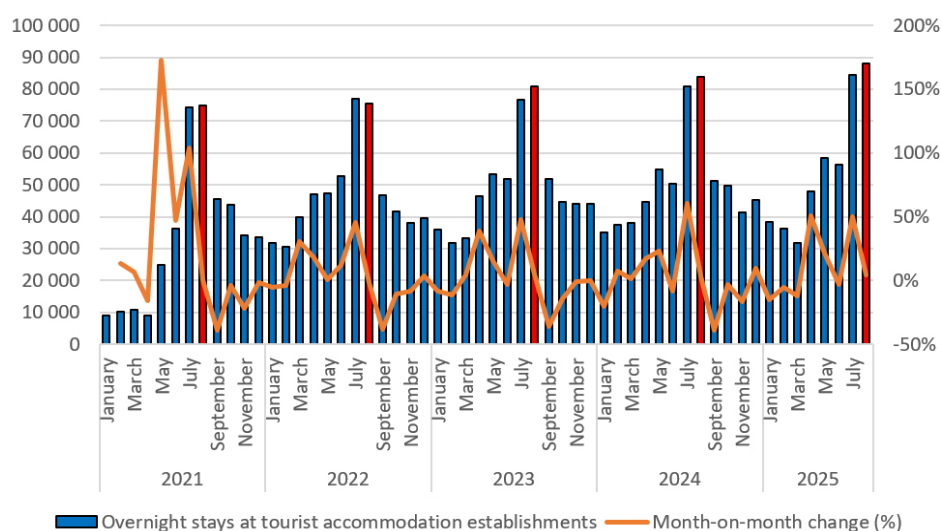
Source: KSH Dissemination Database, authors' own construction

The cases of the major urban venues—Debrecen and Szeged—clearly illustrate this general finding. In the case of the Campus Festival in Debrecen, an examination of the monthly guest and overnight stay data for July reveals no consistent spike attributable to the festival (Figure 4). While a sharp increase is observed in July compared to June, this growth continues into August. Furthermore, in 2021—when the Campus Festival was held in a reduced format due to COVID-19—the July increase did not differ significantly from those observed in subsequent years. This implies that, in terms of accommodation turnover, July and especially August are the peak summer months, and the festival does not substantially modify this pattern. Although a significant increase was observed in 2024 (a 36% increase in overnight stays compared to the previous year and a 70% increase compared to

the previous month), this was not accompanied by a corresponding trend in guest numbers (+8% compared to the previous year). The picture is further nuanced by the fact that in July 2025, a decrease (–2%) was already recorded compared to the previous year. It can be concluded that the 2024 anomaly was likely not the result of the festival but rather of other independent factors (e.g., major industrial investments in and around the city) increasing demand for accommodation. It is also worth noting that in Debrecen, August is a stronger month for tourist accommodation (likely due to the Flower Carnival) than July (the month of the Campus Festival), which supports the finding that the Campus Festival has no detectable impact on accommodation turnover. The data analysis therefore shows that, within the tens of thousands of overnight stays in Debrecen, there is no “anomaly” (surplus) that can be attributed to a festival effect.

A similar situation is observed in Szeged, where August is also the peak month when SZIN is held; however, the data do not show a significant turnover surplus (Figure 5); in fact, barely any increase is observable compared to the previous month.

Figure 5. Development of Overnight Stays in Szeged’s Tourist Accommodations, Highlighting the Month of the SZIN Festival



Source: KSH Dissemination Database, authors’ own construction

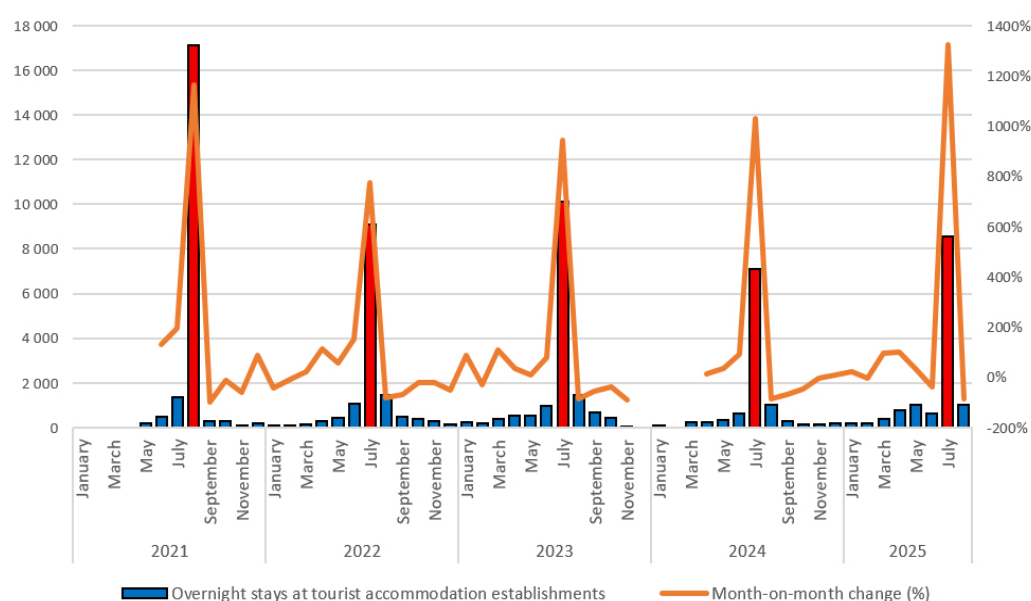
When examining the surroundings of the settlements, we found no evidence of the festivals’ impact on accommodation guest turnover in the vicinity of Debrecen or Szeged. Near Debrecen, with the exception of Hajdúszoboszló, there are no settlements with significant accommodation capacities, and the data for Hajdúszoboszló show no detectable impact from the Campus Festival. Near Szeged, Mórahalom and Hódmezővásárhely possess more significant capacities, but neither city experienced a substantive change in accommodation turnover during the festival month.

Research on other festivals (Indra, 2009) also shows that visitors rarely stay beyond the immediate vicinity of the festival venue, and a significant proportion spend the night on the festival grounds (e.g., Sziget Festival). It was also characteristic of Balaton Sound that the majority of visitors find accommodation in Zamárdi or in neighbouring Szántód, very close to the venue (Hinek et al., 2026).

Based on this, even if university and youth festivals have an impact in Szeged and Debrecen (our data suggest they do not, or that it is negligible), it is typically concentrated within the city where significant capacities are available, while no spillover effects are generated in the surrounding settlements.

The most complex case among university festivals is EFOTT and the Lake Velence region, which at first glance appears to be an exception. In the host settlement of Sukoró, a dramatic “festival shock” that can no longer be explained by natural seasonality is observed in the guest turnover statistics. On average for the 2021–2025 period, the number of overnight stays in July increased more than tenfold in certain years compared to June (Figure 6). When compared to the average of June and August, the number of guests in July exceeded the average of the preceding and following months by +337%, and the number of overnight stays by +597%, producing a pronounced spike in the settlement’s data. Between 2022 and 2025, approximately two-thirds of the settlement’s total annual accommodation turnover typically fell within this single month.

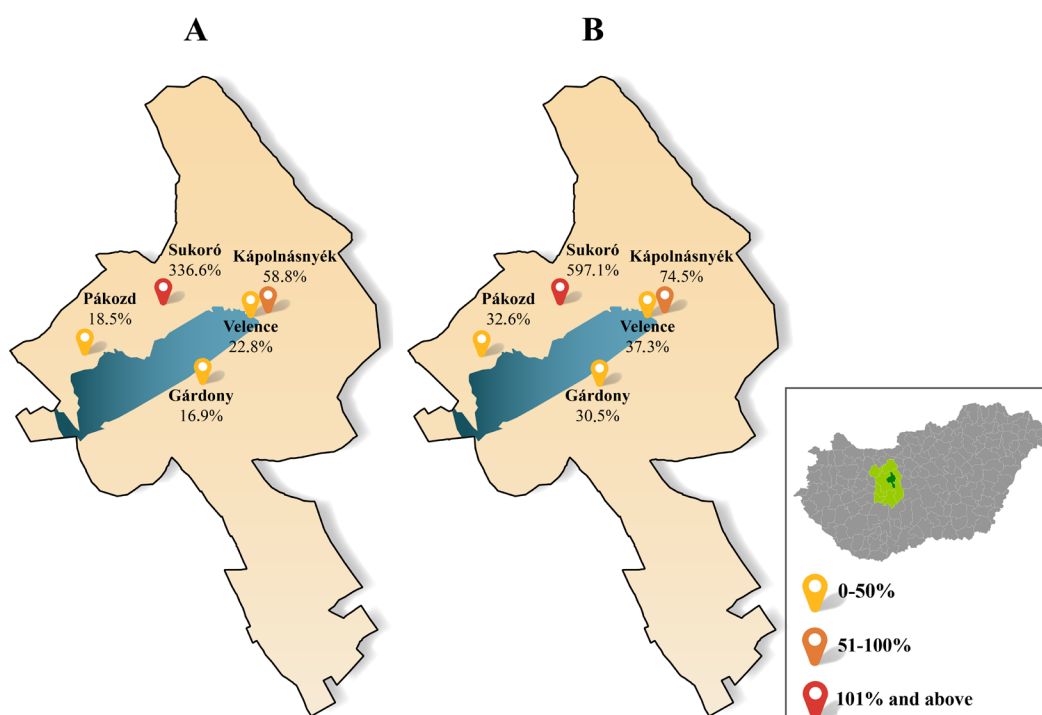
Figure 6. Development of Overnight Stays in Sukoró’s Tourist Accommodations, Highlighting the Month of the EFOTT Festival



Source: KSH Dissemination Database, authors’ own construction

However, this striking relative growth must be qualified, as the scale of accommodation capacities and their turnover in Sukoró is very low; between 2022 and 2025, the annual number of guests ranged only between 3,000 and 5,000, with overnight stays around 12,000–15,000. This is roughly equivalent to the performance of a single medium-to-large-capacity hotel in Budapest. Consequently, the jump attributable to the festival is much more modest in absolute terms: it represents an average surplus of +1,297 guests and +4,653 overnight stays compared to the arithmetic mean of turnover in the months preceding and following the festival period.

Figure 7. Change (Surplus Turnover) in the Number of Guests (A) and Overnight Stays (B) in the Tourist Accommodations of Settlements Around Lake Velence Compared to the Average Turnover of the Months Before (June) and After (August) the Festival, 2022–2025 Average



Source: KSH Dissemination Database, authors' own calculation/construction

Since Sukoró's capacities are minimal, to better estimate the festival's impact, we also examined turnover in the surrounding Lake Velence settlements during the month of EFOTT. We applied the same method as in Sukoró: calculating the arithmetic mean of turnover for the months before (June) and after (August) the festival, then comparing this average to the July (festival month) turnover. These percentage increments were averaged for the years 2021–2025. The five-year average July guest and overnight stay increments, compared to the averaged turnover of the surrounding months, were not outstanding (Figure 7), leading to the conclusion that the festival's impact does not radiate significantly to the surrounding settlements and does not generate substantive regional turnover growth. The July surplus measured in the investigated settlements (Gárdony, Pákozd, Velence) aligns with turnover growth resulting from natural summer seasonality. In Velence and possibly Kápolnásnyék—although the latter is not an immediate neighbour of Sukoró—a spillover effect may arise due to geographical proximity. In Velence, the absolute surplus (average +1,181 guests, +5,742 overnight stays) is similar to that of Sukoró, but these figures occur alongside a much higher total settlement turnover and are likely largely due to natural seasonal peaks.

An analysis of EFOTT 2022 by the Hungarian Tourism Agency (MTÜ), based on NTAk and mobile cell data, showed similar results. In 2021, 10,000 overnight stays were recorded in Sukoró, which decreased to 7,900 in 2022—a negligible figure compared to the festival's 80,000–90,000 visitors and five-day duration, even if some accommodation impacts appeared in Gárdony and

Velence (MTÜ, 2022). These data are consistent with our results; absolute differences stem from methodological variations between our approach (growth relative to the average of the preceding and following months) and the agency's approach (turnover during the festival week compared to the preceding week).

In summary, the impact of EFOTT on tourist accommodation turnover is local—although in this case some spillover effects are observable—and is negligible for the host region (Lake Velence) as a whole. Across the five settlements (Pákozd, Sukoró, Velence, Kápolnásnyék, Gárdony), the annual guest turnover averaged over 90,000 guests and 250,000 overnight stays. Based on available data, approximately 4–6% of the annual guest turnover is attributable to EFOTT. This is not significant, especially considering that turnover along the lake is highly seasonal; within this concentrated volume, only every twentieth overnight stay is linked to the festival.

Factors Mitigating Accommodation Impacts

Given that the attendance of university and youth festivals has developed favourably—characterised by rapid post-COVID recovery, high resilience, and visitor numbers reaching or approaching 100,000—the evaluation of the above results raises a critical question: where are festival-goers staying if the impacts of these festivals are undetectable or only limitedly identifiable in tourism accommodation turnover?

The most likely explanation is that a significant proportion of festival-goers (especially in urban venues such as Debrecen and Szeged) are local residents or arrive from surrounding settlements (e.g., from Székesfehérvár to EFOTT) and thus do not utilise accommodation. In this context, it is important to note that registered attendance figures for festivals essentially represent the aggregate number of passes and day tickets sold. Many attendees arrive with day tickets, which are not only more affordable than purchasing a full-event pass but also allow visitors to select specific days (evenings) for particular programmes. For day-ticket visitors, the utilisation of accommodation is typically non-existent or occurs at a much lower rate. If we assume that day-ticket holders constitute the majority—as is also the case for the Sziget Festival—it is unsurprising that these festivals have a negligible impact on accommodation guest turnover.

Another factor is the price sensitivity of the target group (students and youth), which likely results in an overrepresentation of non-registered accommodation (e.g., staying with friends or relatives) that does not appear in official datasets.

A third key factor that nuances the previous two is that the festivals themselves provide accommodation. In the case of SZIN, the Szeged Partfürdő Camping and Apartments operates as a permanent campsite on the festival grounds, recommended by the organisers. In Sukoró, during EFOTT, organisers provide camping opportunities on a section of the public beach further from the waterfront and the stage, accessible with a festival/camping ticket. This “pop-up” campsite almost

single-handedly explains the surplus in guest and overnight stay numbers observed in Sukoró's statistics, given that the settlement's permanent accommodation capacity is otherwise minimal.

CONCLUSIONS

The study reaches two seemingly contradictory conclusions. On the one hand, the investigated university and youth festivals (EFOTT, SZIN, Campus) demonstrated extraordinary market resilience in the post-COVID-19 period; their attendance figures not only recovered but grew, in contrast to the recession or disappearance of major market-leading festivals.

On the other hand—representing the central paradox of the research—this outstanding market success and six-figure attendance volume are not detectable in the accommodation turnover of the host destinations using the applied methodology (analysis of tourism accommodation data), with the exception of EFOTT, where the settlement's size and baseline tourism turnover are relatively modest.

In the two major cities investigated, Debrecen and Szeged, the accommodation impact of the Campus Festival and SZIN is not statistically identifiable. This does not mean that such an effect does not exist, but rather that tourism accommodation data do not allow for an isolated estimation of the surplus generated by these festivals within overall urban turnover.

In the Lake Velence region, the July turnover increase is generally observable across settlements, but this is predominantly the result of natural seasonality. The “festival effect” is primarily detectable in Sukoró and, among the surrounding settlements, in Gárdony and Velence. The growth in accommodation turnover attributable to EFOTT along the lake accounts for approximately 4–6% of the annual guest and overnight stay figures.

In summary, while these three successful youth festivals host over 100,000 visitors annually, their impact is either undetectable in municipal accommodation statistics (Campus, SZIN) or the detected turnover is only locally prominent and cannot be considered significant in a broader regional context (EFOTT).

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Other Sources

The annual guest turnover indicators for the National Touristic Meeting of University and College Students (EFOTT), the Szeged Youth Days (SZIN), and the Campus Festival in Debrecen used in this study were derived from various sources. The vast majority of the data consists of figures released directly or indirectly by the organizers. These were either published directly by the organizers on various

media platforms (official websites, press conferences, etc.) or were reported in various interviews and accounts (e.g., reports by the Hungarian News Agency [MTI] or Hungarian Television, as well as feature articles on major domestic media platforms) where the organizers provided statements to the respective outlets. A smaller portion of the data originates from official event reports and coverage produced by various offline and online media outlets regarding the festivals.

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Hungary's Border Sections After the Schengen Opening: Integration Potential in the Context of Population Concentration and Urban Gravity

ABSTRACT

With Croatia's accession to the Schengen Area in 2023, followed by Romania's in 2025, Hungary's border regions have once again come to the fore. The expansion of the Schengen Area has created a new spatial context in which population concentration in border areas and the gravitational pull of nearby urban centers indicate varying levels of integration potential across different border sections. This study provides a bilateral comparative analysis of Hungary's border sections based on population concentration in border areas and the urban gravity of nearby centers. The analysis draws on NUTS 3-level population data, the Border Population Concentration Index (BPCI), and the gravitational weight of nearby urban centers located on both sides of the border. The results show that Hungary's border sections exhibit considerable differences in terms of integration potential: in regions with larger urban centers, denser opportunities for spatial linkages emerge, whereas along sections characterized by weaker urban networks and lower population concentration in border areas, the spatial conditions for integration are more limited. These differences suggest that the possibilities and anticipated directions of cross-border cooperation vary significantly across border sections. An important question for further research is which territorial and institutional instruments may help strengthen linkages in less favorably positioned areas.

Keywords: state border, border region, Hungary, urban gravity, population concentration, integration potential

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Acknowledgments: Project no. 152305 has been implemented with the support provided by the Ministry of Culture and Innovation of Hungary from the National Research, Development and Innovation Fund, financed under the Starting funding scheme.

INTRODUCTION

In recent years, Hungary's Schengen border system has been expanded to include two new sections: the accession of Croatia (2023) and Romania (2025) has created a new spatial situation in Hungary's border regions (European Parliament [EP], 2022; European Commission [EC], 2024a). The enlargement of the Schengen Area necessitates a novel approach to the bilateral comparative analysis of border regions, particularly in cases where population concentration, transport linkages, and the spatial organizing role of urban centres vary significantly from one border section to another. An issue that deserves special emphasis is the rising prominence of the Hungarian–Romanian border, which has emerged as a zone of connectivity within the European Union [EU] as a result of spatial structural transformation processes in the Schengen Area (Horeczki & Szilágyi, 2025).

In the EU narrative, the concept of periphery may refer to macro-regional (Central and Eastern European) entities, remote, sparsely populated, rural (mountainous) areas, as well as internal peripheries, border regions, peri-urban zones, or less developed Member States (EC, 2024b; Kühn, 2015). Our previous analyses emphasize the co-existence of a variety of peripheries in Hungary. Dependency as an underlying condition and the issue of inequality are defining concepts in centre–periphery theories (Pike et al., 2011; Wallerstein, 1974). Regions undergoing peripheralization can be distinguished by their less favourable socio-economic situation and lower accessibility compared to neighbouring regions. Hungary provides an interesting study area due to its semi-peripheral position in the global economy, facing the classic dilemma of “catching up” (Arrighi, 2014; Molnár, 2021): fulfilling its role in the international division of labour, facilitated by the liberalization of trade and capital flows, or striving for central functions through comprehensive economic restructuring. Spatial polarization manifests itself in various forms in Hungary: between the capital and the countryside; between the western and eastern parts of the country; across different border sections; and between regional centres, small towns, and villages. This division is also apparent in the geographical characteristics of border regions. Throughout history, central places and areas have consolidated their economic base by attracting labour, knowledge, and thus entrepreneurial and innovation capital from other settlements (Nagy et al., 2022; Péntzes, 2013a).

The authors have analyzed border sections extensively, focusing on the socio-economic implications of the enlargement of the Schengen Area and the geographical fragmentation of border sections. Increased border permeability has strengthened everyday interactions and cross-border cooperation in a number of regions, as documented in the literature, but their intensity is decisively shaped by the specific location of the border region, its transport infrastructure, and the structure of the settlement network (Lados, 2005; Rechnitzer, 2005). The present study, while adhering to this strand of research, does not address the direct implications of open borders but rather focuses on the comparative characteristics of the newly emerging spatial situation. A study by Péntzes (2013b) modeled the cross-border catchment areas of the Hungarian–Romanian border region using the gravity method, based on different scenarios of border openings and road network development (Péntzes, 2013b).

Fragmentation is a dominant characteristic of European border regions, often acting as a barrier to integration. In Central and Eastern Europe, the systemic change and subsequent EU accession have promoted and reinforced horizontal, cross-border interactions both within and beyond the region, with access to EU funds serving as a powerful incentive (Péntes et al., 2024). Border regions are particularly affected by policies targeting the mitigation of development disparities and the catching-up of lagging regions. Importantly, borders are not depicted in the literature as simple dividing lines, but rather as spatial constructs shaping social, economic, and geopolitical relations (Van Houtum, 2005). This has inspired the investigation of cross-border aspects of regional integration, such as cooperation in governance (Perkmann, 2003), analyses in various geopolitical and retrospective contexts (Konrad et al., 2026), sustainability-related issues (Liu et al., 2021), as well as demographic perspectives (Gwiażdzińska-Goraj, 2026).

Drawing on the results of our previous analyses, which highlighted the vulnerability of border-area populations in the Central European region (Horeczki et al., 2025), this study examines the size of border-area populations and the gravitational pull of cities on border crossing points. The objective of this research is to explore the spatial disparities in population concentration and urban gravity along Hungary's Schengen borders, as well as the resulting integration potential across different border sections.

METHODS

The subjects of our analysis are Hungary's Schengen borders as of January 1, 2025, more specifically the country's state border sections shared with Austria, Slovenia, Slovakia, Croatia, and Romania. The present situation developed in three stages. On December 21, 2007, Hungary—together with Slovakia (679 km) and Slovenia (102 km)—joined the Schengen Area, which had already included Austria (356 km) for ten years, increasing the proportion of Schengen border sections from 0% to 50.6%. Croatia's accession (355 km) on January 1, 2023 further raised this proportion to 66%, which reached 86% with Romania's (453 km) accession on January 1, 2025.

The total length of the Schengen border sections (1,945 km) can be divided into two non-contiguous parts, as the Hungarian–Ukrainian (137 km) and Hungarian–Serbian (164 km) sections—external borders of the EU located in the northeast and southeast—interrupt the continuity of Hungary's Schengen borders. Together with the Hungarian–Slovenian border section, these represent the shortest external border sections of Hungary (Vukovich, 2022, p. 423).

The broader geographical scope of the analysis covers NUTS 3 units located on both sides of the Schengen border; however, the main focus of the research is the border zone defined by a 20 km straight-line distance. Within this 20 km border zone, 37 NUTS 3 units contain inhabited areas on both sides of the border (Hungary: 15; Croatia: 6; Austria: 6; Slovakia: 5; Romania: 4; and Slovenia: 1). According to the 2021/22 census, the combined population of these units exceeds 14 million people;

however, when narrowing the focus to the 20 km border zone, this figure decreases to nearly one-third (4.8 million inhabitants).

Table 1. Categories of the Examined Sample Sizes by the Population Intervals of NUTS 3 Units

Sample size	Country	Average population	Data source
Large unit size	Slovakia	674,000 (interval: 566,000 – 782,000)	Census Slovakia 2021, 2023
Average unit size	Romania	485,000 (interval: 330,000 – 650,000)	Rezultate definitive RPL 2021 – Recensământul Populației și Locuintelor, 2025
Average unit size	Hungary	447,000 (interval: 182,000 – 1,333,000)	Census database – Central Statistical Office, 2025
Low unit size	Croatia	133,000 (interval: 70,000 – 258,000)	Population, Households and Families by Statistical Region, Year and Measures
Low unit size	Slovenia	114,000 (one examined unit)	2025SODB2021 – Population – Basic results, 2025
Low unit size	Austria	99,000 (interval: 37,000 – 63,000)	STATcube – Log in, 2025

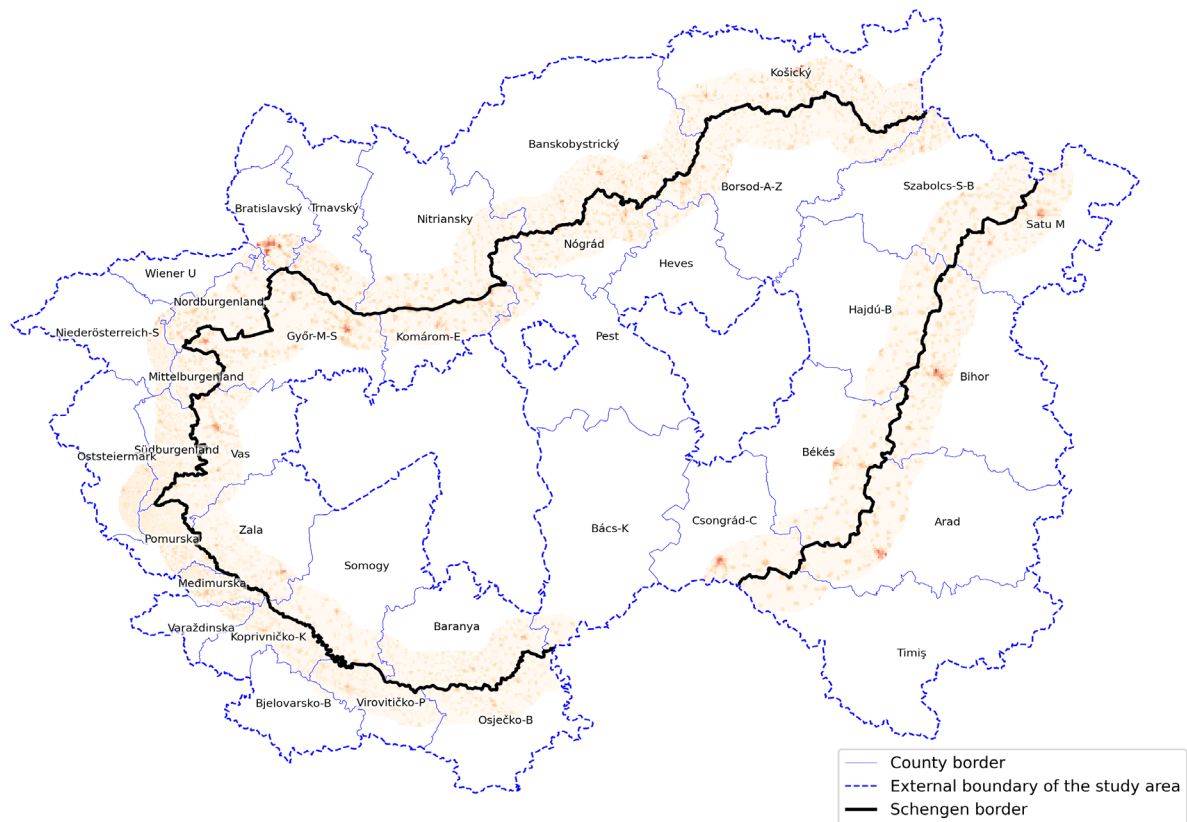
Source: own compilation

Given the sometimes considerable variation in the size of NUTS 3 territorial subdivisions across the countries of the examined region, the sample was divided into two distinct groups (see Table 1): countries with large-sized units (Slovakia, Romania, Hungary) and those with NUTS 3 units of a smaller average population size (Croatia, Slovenia, Austria). The most common units of observation are counties; however, Slovenian and Austrian NUTS 3 level units do not perform administrative functions. In Austria, districts represent the administrative tier between the province and the municipality, and these may coincide with the NUTS 3 level (as in the case of Central Burgenland and the Upper Pula District). Within the selected sample, Central Burgenland in Austria represents the NUTS 3 unit with the smallest population, with fewer than 38,000 inhabitants.

Contrary to previous analyses in Hungary focusing on border buffer zones with a depth of 25–30 km, the present enquiry defines the study zone with a depth of 20 km. This is fully consistent with the 30 km threshold defined in the Local Border Traffic Regulation (1931/2006/EC), as well as with the 20 km “frontier worker” band applied to daily cross-border commuters (e.g. Italy–Switzerland) (Gazzetta Ufficiale, 83/2023.06.30). As indicated by previous Hungarian data, the majority of commuters from Hungary to Austria live within 20 km of the state border, with 40% residing in settlements adjacent to it (Hungarian Central Statistical Office [HCSO], 2015).

A 25–30 km radius would have enabled the inclusion of additional Hungarian and non-Hungarian NUTS 3 regions (e.g. Fejér, Tolna counties, Budapest), which, however, do not fall within the category of “border regions,” and their inclusion would have distorted the analytical focus. In several neighbouring countries, even a zone with a depth of 20 km may encompass entire small-sized NUTS 3 regions, as the size of statistical-administrative units implies different territorial scales across countries (Figure 1).

Figure 1. The Examined Schengen Border Zone



Source: own compilation

When examining NUTS 3 units in Hungary, although several counties and Budapest do not directly border Schengen states, they may still be partially covered by the buffer zone (e.g. the northwestern corner of Heves County). Due to the smaller territorial extent of NUTS 3 regions on the other side of the border—particularly in Austria and Croatia—the 20 km zone in some cases not only includes but extends beyond border units. As a result, the size of the border-area population can also be calculated for units without direct adjacency to the Hungarian state border, such as Oststeiermark, Niederösterreich-Süd, or Wiener Umland/Südteil, as well as Croatia's Varaždin County ("behind" Medimurje) and, to a lesser extent, Bjelovar-Bilogora County.

To analyze the border sections, we used and modified 1:1 million-scale shapefiles from the EU GISCO database (Eurostat, 2021). The use of this dataset raises a methodological issue, as the total length of Hungary's border derived from this method is 2,000 km—approximately 10% shorter than the 2,246 km reported by the HCSO. For comparison, we also included the OpenStreetMap representation of Hungary's border (2,214 km), which closely approximates the official value.

This discrepancy can be attributed to the course of the boundary line, the resolution of the map, and potential vertical deviations; the GISCO-derived boundary can therefore be considered a simplified representation. The discrepancy is not uniform: borders following rivers and mountain ranges (i.e. natural borders) appear to be the most simplified, whereas smaller deviations occur along more

conventional, angular border sections (Table 2). This is important because the impact of border-length simplification on indicator values (such as the BPCI), which are relative to border length, may vary across different border sections.

Since meter-level accuracy of the state border line has no direct implications for the daily lives of inhabitants, the use of a simplified boundary was deemed justifiable for ensuring comparability across different types of border zones.

Table 2. Difference Between the Lengths of the Shapefile and the HCSO Border Line

Schengen border (km)	Austrian	Slovak	Slovenian	Croatian	Romanian	Total
HCSO	356	679	102	355	453	1945.0
GISCO	314	577.4	87.5	322	421	1721.9
Deviation, %	11.80	14.96	14.22	9.30	7.06	11.47

Source: own compilation

We refined the method for calculating the border-area population used in our previous comparative analyses of the Hungarian–Romanian and Hungarian–Croatian Schengen border sections (Horeczki & Szilágyi, 2025; Szilágyi, Rácz, & Horeczki, 2025). As a point of departure, we calculated the 2021 population by grid cell, while delineating the 20 km border zone based on centroids; that is, the inclusion of a given cell in the analysis was determined by the straight-line distance between the center of the grid cell and the border line. This refinement primarily concerns the treatment of cells “divided” across administrative boundaries or state borders.

We created a separate centroid layer from the GISCO 1×1 km population grid and then spatially linked these points to the NUTS 0 and NUTS 3 polygons (using the “within” predicate). As a result, the total population of a grid cell could be assigned to only a single territorial unit. The methodological justification for this step lies in the fact that border lines and administrative boundaries often intersect grid cells, and aggregation based on pre-stored territorial codes does not always allow for unambiguous classification. By contrast, centroid-based assignment ensures that a cell’s population is attributed to the unit containing its center, thereby preventing populations of cells split by borders from being counted on both sides (in extreme cases, multiple times). This adjustment directly affects the BPCI numerator, i.e. the N_d value representing the border-area population.

A separate control study was conducted to validate the calculation of the border-area population. A total of 4,991,405 people were counted within the 20 km zone on both sides of Hungary’s Schengen borders, while the estimated number was 4,990,734 when grid cell centers were matched with the examined NUTS 3 units using the centroid-based assignment method. The slight discrepancy between the two values (671 people) suggests that the centroid-based method can estimate the total size of the border-area population without significant distortion.

It should be noted that, when computing the BPCI, the absence of a border section implies that the indicator can only be interpreted for NUTS 3 units directly adjacent to the state border. A total of 30 such units were identified in the full sample, with a corresponding border-area population

of approximately 4,791,405 people. This indicates that, within the 20 km border zone, 199,329 people reside in eight NUTS 3 units that have a border-area population but no direct border section; consequently, individual BPCI values could not be assigned to them.

To address this issue, we did not apply a uniform solution but introduced adjustments tailored to specific spatial configurations. In cases where a NUTS 3 unit without a direct border section had infrastructural access to the state border via a single adjacent cross-border unit, its entire border-area population was added to the “intermediate” unit, thereby increasing the corrected BPCI value of the directly adjacent unit (e.g. the border-area population of Oststeiermark increased the BPCI of Südburgenland, while that of Varaždin County increased that of Međimurje County).

In situations where the border could be accessed via two alternative routes—that is, where two intermediate NUTS 3 units provided effective connections—the border-area population was distributed evenly between them (e.g. the population of Heves County was divided between Borsod-Abaúj-Zemplén and Nógrád). Cases in which a NUTS 3 unit was located along the Schengen border but lacked road crossings, and where significant natural barriers (in this study, rivers) hindered such connections, were treated as a separate category. This situation characterizes the Slovak border section of Szabolcs-Szatmár-Bereg County (Tisza River), as well as the Croatian border section of Bács-Kiskun County (Danube). In such cases, crossing the border required passage through another Hungarian NUTS 3 unit, implying a substantial detour.

As this disrupts the logic of the 20 km border zone measured as the crow flies, such grid cells were only partially assigned to the de facto connecting NUTS 3 unit, namely with half of their population (e.g. Baranya in the case of Bács-Kiskun, and Borsod-Abaúj-Zemplén in the case of Szabolcs-Szatmár-Bereg). Overall, the application of the halving rule reduced the population base used for calculating the BPCI: the total border-area population from which corrected BPCI values were derived amounted to 4,956,013 people.

To determine the relative proportion of the border-area population, we used the Border Population Concentration Index (BPCI). This indicator cannot be substituted by the conventional population density of the 20 km border zone. Population density is an areal indicator that expresses the size of the population relative to the area of the examined zone (people/km²) and does not treat the border line as an independent factor. In this study, however, the length of the border section (L) is the key variable. The emphasis is therefore not on the general “density” of the border zone, but rather on the concentration of the border-area population along different Schengen border sections, relative to border length. This highlights the nature of the BPCI as a linear concentration indicator: it expresses the number of inhabitants within a border zone of width $d = 20$ km per kilometre of the examined (NUTS 3) border section; its formal unit of measurement is therefore people/km.

$$\text{BPCI} = \frac{N_d}{L}$$

where

N_d is the total population (people) of the border zone with a depth of $d = 20$ km

L is the length of the given land border (km).

A higher BPCI value indicates a greater share of the border-area population and a stronger linear population concentration, which—within the logic of this study—can be interpreted as a spatial precondition for cross-border linkages; however, it does not measure the intensity of actual interactions. The N_d values used for calculating the BPCI were derived and adjusted as specified above. The term “corrected BPCI values” refers to those cases in which the spatial allocation of the border-area population (particularly for units without a direct border section) was carried out using the method presented here.

This approach is not without historical precedent. In the 1930s, András Rónai applied a ratio linking population and border length, motivated by geopolitical considerations; his objective was to determine the “external” demographic pressure exerted by populations on the other side of the border, with higher values interpreted as indicators of a state’s geopolitical vulnerability (Rónai, 1933)⁴. By contrast, the BPCI applied in this study does not express external pressure, but rather internal pressure, more specifically the share of the border-area population along a given border section.

In line with our initial assumption that the concentration of cross-border populations constitutes an important spatial condition for cross-border linkages—and that the BPCI can therefore be interpreted as a proxy for interaction potential—it is reasonable to assume that nearby large cities function as potential organizing hubs for such linkages (Hardi, 2009). The analysis of urban gravity highlights the higher integration potential of major urban centres along different border sections and their role as organizational hubs shaping the directions of cooperation.

Border cities are popular destinations for shopping tourism (Rechnitzer, 2005) and for tourism more generally (Pirisi & Reményi, 2009). Within the Schengen Area, firms from the opposite side are free to establish themselves in industrial parks; similarly, cultural and educational institutions may extend their reach “beyond the border” (EduCultCentre project). In addition, the suburban zones of nearby large cities often extend across national borders (Balizs & Somogyi, 2024).

These asymmetrical processes—for example, the emergence of cross-border educational catchment areas—tend to benefit Hungarian secondary and higher education institutions, while suburbanization typically contributes to the growth of non-Hungarian centres (e.g. Bratislava, Košice, Oradea, and Arad). Whereas population concentration in border areas creates the (random) possibility of interactions, the presence of urban centres introduces rhythm and regularity into these processes. Therefore, it is worthwhile to examine these two components in parallel.

We analyzed the spatial organizing effect of cities on border crossings using a gravitational model. This study does not aim to measure actual traffic volumes, but rather to identify potential linkages shaped by the population concentration of cities and the accessibility of border crossings. The analysis draws on Newton’s law of gravity, where m_1 represents the population of a given city and m_2 the border crossing point; in the absence of population data for the latter, a value of 1 is uniformly assigned. G denotes the gravitational constant, which is commonly used as a weighting factor in similar studies; for the purposes of this analysis, its value is set to 1. Finally, r denotes the distance

⁴ Zoltán Hajdú noted the significance of this historical precedent.

between the city and the border crossing point, calculated here as travel time for passenger vehicles, measured in minutes.

$$F = G \frac{m_1 m_2}{r^2}$$

To apply the above formula, a database of Hungary's Schengen border crossings and the identification of the study cities were required. The analysis included border crossing points that facilitate the uninterrupted passage of road vehicles; accordingly, ferry crossings, as well as those intended exclusively for pedestrians, cyclists, or horseback riders, or lacking a paved surface, were excluded. The finalized database comprised 107 crossing points, of which 38 provide access to Slovakia, 28 to Austria, 22 to Romania, 11 to Slovenia, and 8 to Croatia.

Delimiting the scope of cities under study proved to be more challenging. Ultimately, all settlements with city and town status (regardless of population size) located within the 20 km zone of the Schengen border area (on both sides of the border) were included in the analysis. The seats of NUTS 3 units located within the border zone were also considered among the selected settlements, including those not directly adjacent to the state border (e.g. Eger).

In addition, three capital cities—Bratislava, as well as Budapest and Vienna (the latter two not located within the border zone)—and Graz were included in the database. However, in Bács-Kiskun County, Baja was selected instead of Kecskemét. The final database comprises 187 settlements with city status.

A critical aspect of the study was the identification of an appropriate methodology for calculating urban population. The analysis was conducted using the most recent census data from 2021 (2022 in the case of Hungary) (HCSO, 2025). It should be noted that Austria (Statistik Austria, 2023) and Slovenia (Žnidaršič & Miklič, 2022) did not conduct traditional, comprehensive censuses; instead, they relied on register-based censuses (using institutional data), which differ methodologically from those conducted in other countries (Rezultate definitive RPL 2021 – Recensământul Populației și Locuințelor, 2025; Census Slovakia 2021, 2023; Statistički sustav Republike Hrvatske, 2023).

Due to administrative structural specificities in neighboring countries, the population of the urban core and that of the municipality (as defined within LAU boundaries) show significant divergence in Croatia (e.g. 75,535 vs. 96,313 inhabitants in Osijek), a somewhat smaller difference in Romania, while in the remaining countries municipal and administrative boundaries largely overlap. Ultimately, population data for administrative units were used in the analysis.

An alternative approach could have involved incorporating agglomeration and conurbation areas; however, this option was not pursued.

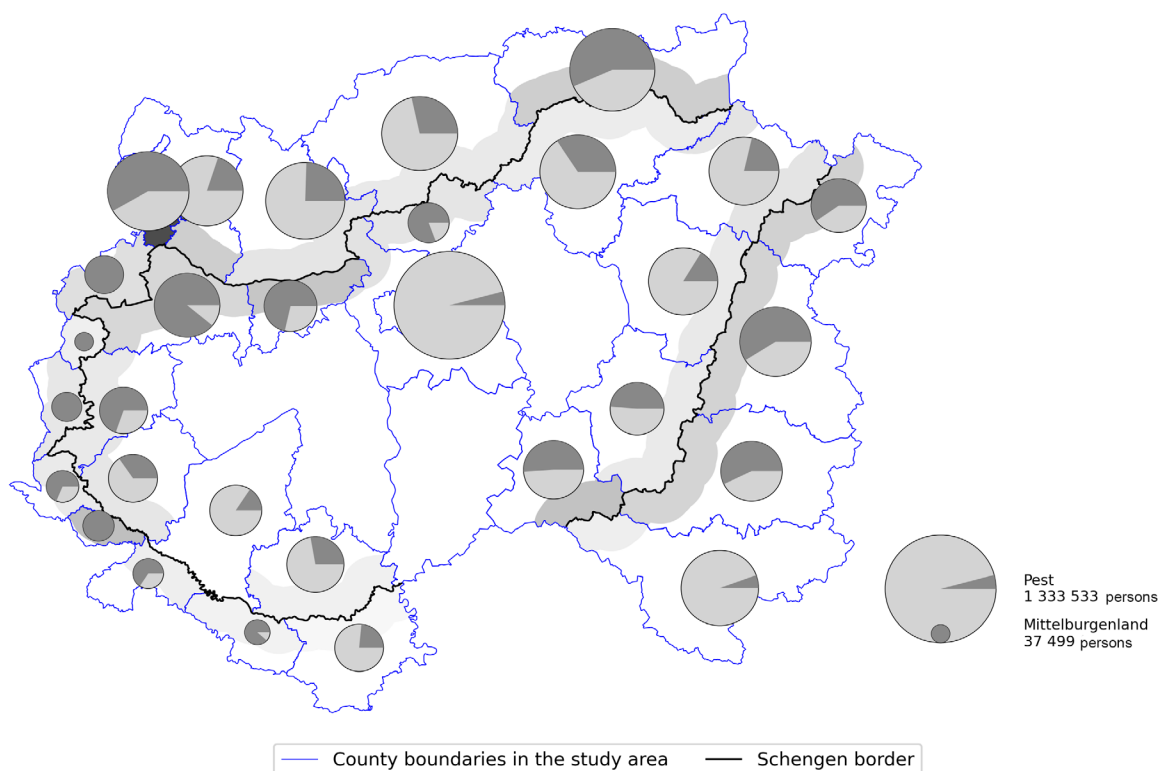
RESULTS

Analysis of the Border-Area Population

Within the 37 NUTS 3 units adjacent to Hungary's border zone, the average proportion of the border-area population is 42.4% (Figure 2), with values ranging from 0.1% to 100% (e.g. Central Burgenland). This may result in an apparent anomaly whereby, in certain units (e.g. Central Burgenland), the proportion of the border-area population appears to exceed the total population; however, this ratio does not affect the calculation of the BPCI. The main justification for excluding the proportion of the border-area population within NUTS 3 units from further analysis is that Slovenian and Austrian census data (register-based census) rely on methodologies that differ from those applied in other countries (Population Census, 2025), which constitutes one of the limitations of the present study.

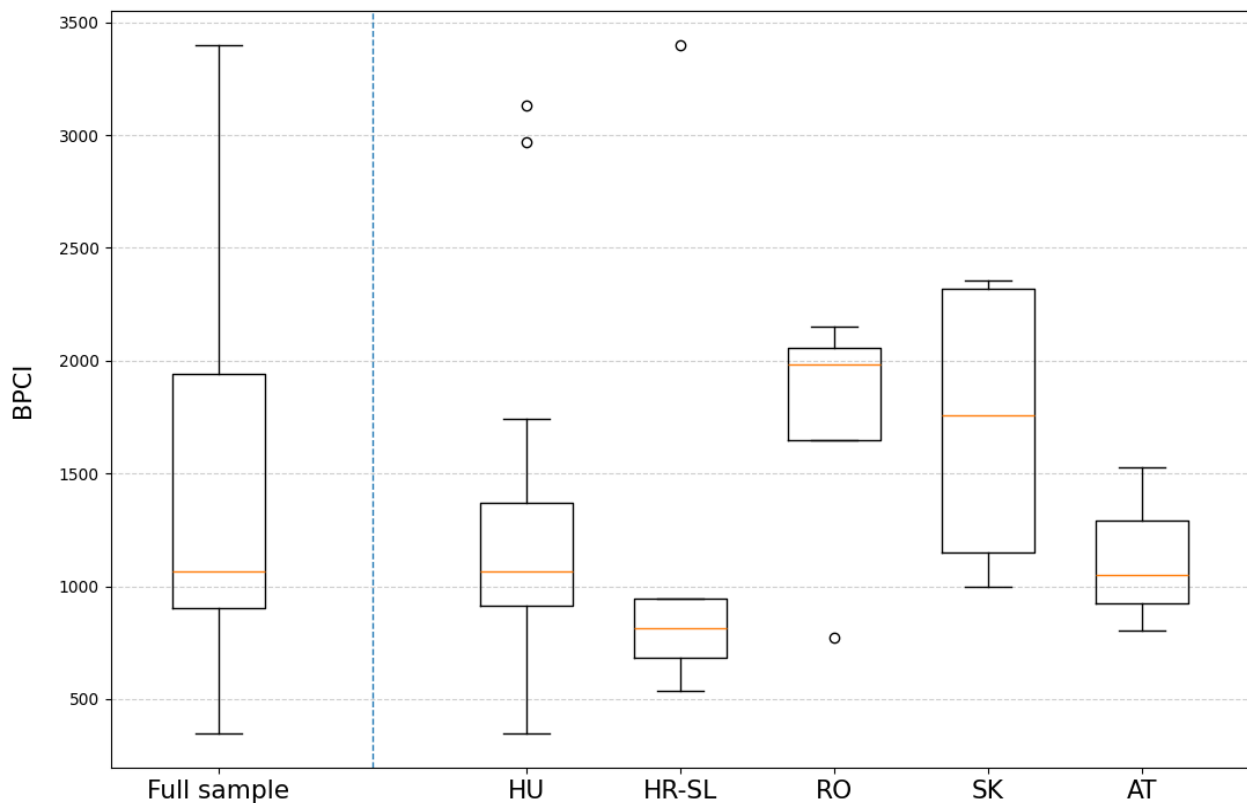
A boxplot analysis of BPCI values identifies a single upper outlier, namely Bratislava County. Excluding this case, the median for the entire sample is 1,064 people/km, while the interquartile range lies between 906 and 1,940 (Figure 3). Based on the regional distribution of the adjusted BPCI values, Hungarian counties (N = 13) have an average value of 1,341 people/km, with an approximately ninefold difference between the extremes: Somogy (347 people/km, the lowest value in the sample excluding Bratislava) and Csongrád-Csanád (3,129 people/km).

Figure 2. Proportion of the Population Living in the Schengen Border Area (20 Km) (Dark Gray) as a Share of the Total Population of the NUTS 3 Unit



Source: own compilation

Figure 3. Boxplot Analysis of BPCI Values (Excluding the Bratislava Outlier (BPCI = 53,842))



Source: own compilation

The Croatian–Slovenian group (N = 5) has an average of 1,276 people/km and a median of 815 people/km, with the maximum value of 3,398 people/km recorded in Međimurje and Varaždin, while the remaining values typically fall within the lower range (538–943 people/km). Within this group, Prekmurje (943) exhibits one of the higher values, although it still falls within the range defined by the Hungarian and Croatian data.

The Romanian side of the border region (Arad, Bihor, Satu Mare, Timiș) shows a higher median (1,721 people/km) and a relatively narrower range (770–2,151 people/km), indicating a more uniform yet higher-density border zone. With the exception of Timiș, all values fall within the upper range, with Arad, Bihor, and Satu Mare each exceeding the overall sample median.

On the Slovak side, Bratislava significantly skews the results; however, even when excluded (N = 4), the group average remains high (1,717 people/km), roughly equivalent to Romanian values and higher than the averages observed in Hungarian, Croatian–Slovenian, and Austrian border regions. Within this group, the only lower outlier is Banská Bystrica County (998 people/km). The extreme value of 53,842 people/km for Bratislava County can be considered an outlier for the entire sample.

Finally, Austrian (Burgenland) units exhibit moderate values, with an average of 1,127 people/km, indicating a relatively balanced population concentration along the border.

As indicated by the corrected BPCI values, the examined Schengen border zones do not form a homogeneous area. Even when excluding Bratislava as an outlier, the greater demographic weight of units along the northwestern border, as well as along the Romanian border sections, is clearly observable. At the same time, the Croatian border area and certain southern and peripheral sections of the Hungarian border exhibit lower linear population concentration.

These findings point to pronounced differences in the population geography of Hungarian border zones affected by the opening of Schengen borders and, consequently, to significant variation in the density of opportunities for spatial linkages across different border sections. This result is consistent with earlier analyses of Hungarian border regions conducted by Tagai and his collaborators approximately one and a half decades ago (Tagai et al., 2009).

The Gravitational Attraction of Cities on Schengen Border Crossing Points

The combined population of the 187 cities in 2021/22 is 8.6 million: 3.9 million in 110 cities in Hungary; 2.3 million in 15 cities in Austria; 1.17 million in 28 cities in Slovakia; 0.8 million in 16 cities in Romania; 0.32 million in 15 cities in Croatia; and 40,000 in three urban settlements in Slovenia. The two extremes are Vienna (1.926 million inhabitants) and Pálháza (977 inhabitants), with an average city size of 46,000 and a median of 8,900.

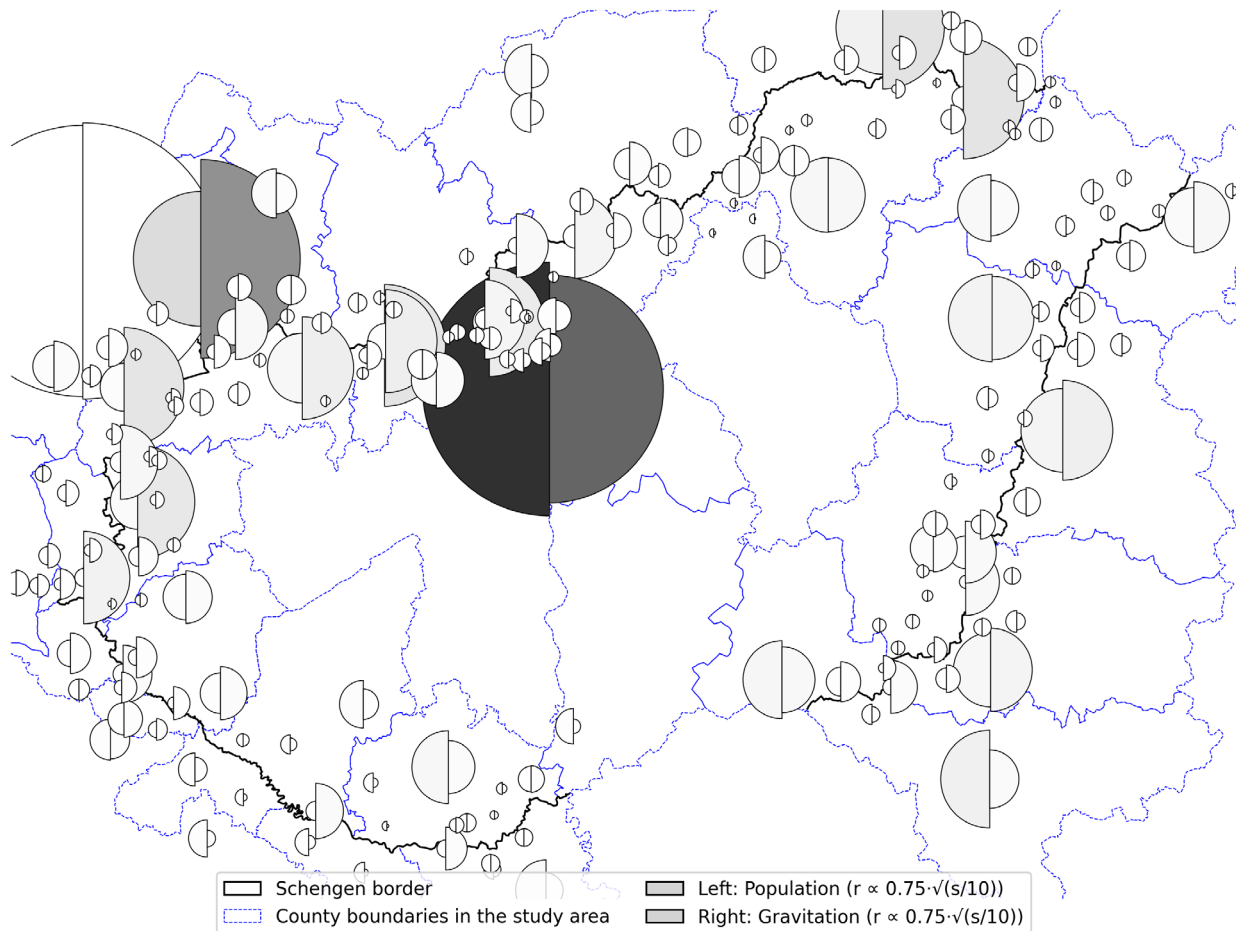
In terms of average values, Austria stands out due to the presence of Vienna (approximately 157,000 inhabitants), while Hungary occupies an intermediate position (35,500) between the upper cluster comprising Romania and Slovakia (50,000 and 42,000, respectively) and the lower group formed by Croatia and Slovenia (21,000 and 13,000, respectively). Half of the cities (93) fall within the 5,000–20,000 population range, one quarter (46) have fewer than 5,000 inhabitants, and one sixth (34) have populations between 20,000 and 100,000. A total of 14 cities with populations above 100,000 were identified in the study area.

To determine the gravitational attraction of the selected cities on the border crossing points included in the database, the shortest travel time had to be calculated, which proved to be the most challenging aspect of the analytical procedure. Rather than pre-filtering cities based on a presumed measurable gravitational influence—an approach deemed excessively time-consuming—we performed queries for the full set of combinations. Identifying all possible pairs of the 187 cities and the 107 border crossing points required a total of 20,009 queries, which were executed automatically in Python using the OpenStreetMap (OpenStreetMap, 2025) Overpass API (Overpass Turbo, 2025).

Within the primary dataset containing approximately 20,000 records, we calculated the gravity coefficient for each city–border crossing pair using the Python pandas library, applying the squared distance factor, which has been shown to preserve the relative importance of dominant centers, although calibration may further refine the analysis (Dusek, 2016). Records with very low values (below 1) were subsequently removed. As a result of this filtering process, 77% of the observations

were eliminated, while only 4% of the total gravitational weight was lost. The resulting reduced (secondary) database contains 4,634 relevant city–border crossing combinations.

Figure 4. Population Size (Left) of the Examined Cities and Their Gravitational Weight (Right) on Border Crossing Points

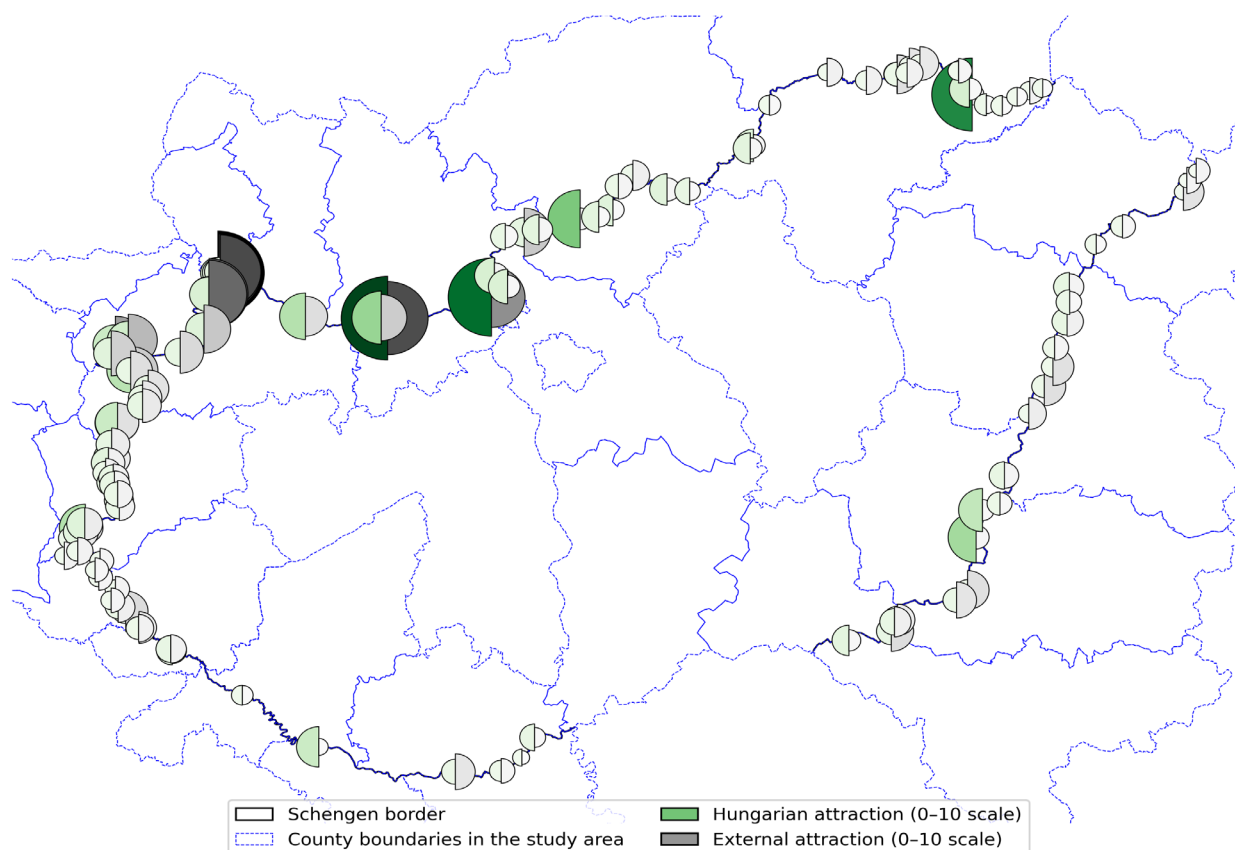


Source: own compilation

When aggregating gravity coefficients at the city level, 16% of the total corresponds to Vienna, 11% to Budapest, over 8% to Bratislava, 5.4% to the twin border cities of Komárom, and approximately 3% each to Sátoraljaújhely and Sopron (Figure 4). The combined share of the 94 cities in the lower segment of the ranking is less than 5%.

The aggregate coefficient calculated for border crossing points again highlights the pre-eminence of the northwestern region: the three Rajka crossing points account for 8.3% of the total gravity coefficient; the two crossings at Komárom account for 4.8%; the two at Hegyeshalom also represent 4.8%; and the Esztergom crossing point accounts for 4.4%. This value can also be disaggregated into Hungarian (“internal”) and foreign (“external”) components (Figure 5), and the gravitational force can be interpreted as having a directional (vector) component.

Figure 5. Aggregated Gravitational Coefficient for Border Crossing Points (Left: “Internal” Coefficient Generated by Hungarian Cities; Right: “External” Coefficient)



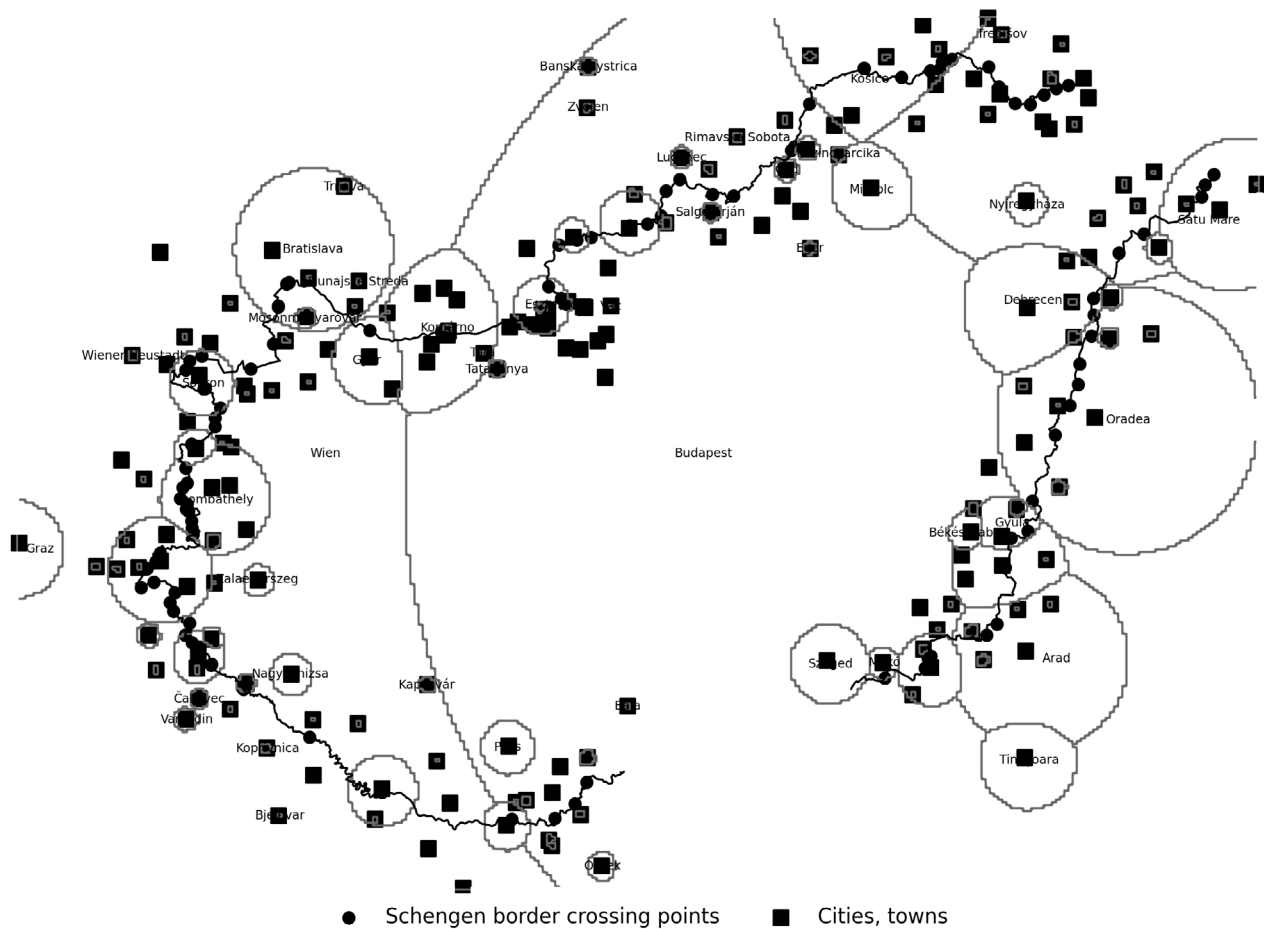
Source: own compilation

We constructed the gravitational dominance map of the examined border crossing points in a Python environment by integrating the two databases. After assigning the aggregated mass (GRAV) and centroid coordinates of the settlements to a GeoDataFrame, we calculated a Newtonian potential function (mass/distance) for each point of a regular grid. Based on the GRAV values assigned to the grid points, each cell was attributed to the settlement with the highest mass, and zones of dominance were delineated by generating square polygons from these dominant cells.

The resulting structure is hierarchical: at the macro level, the territory is divided between Budapest and Vienna, separated by a north–south axis running through central Transdanubia. The gravitational pull of these macro-centres is particularly strong along border sections lacking dominant local centres at the meso- or micro-level.

The Hungarian–Romanian border section is almost exclusively dominated by local centres: at the meso-level, Oradea, Arad, Satu Mare, and Debrecen; and at the micro-level, the spheres of influence of Szeged, Makó, Nagylak, Gyula, and Nagykároly extend to specific border sections.

Figure 6. Gravitational Dominance Map of Hungary's Schengen Border Zones



Source: own compilation

The Hungarian–Slovak borderland is characterized by the dominance of meso-level centres such as Sátoraljaújhely and Košice in the east, while Bratislava, Győr, and the twin border cities of Komárom occupy a similar position in the west. In the central section dominated by Budapest, however, the gravitational influence of micro-centres—such as Esztergom, Ipolyság, Balassagyarmat, Salgótarján, and Ózd–Putnok—extends only to smaller, localized border segments.

Vienna's influence prevails along the Austrian and Slovenian border areas, although it is partially counterbalanced by local meso- and micro-centres on the Hungarian side (Szombathely, Szentgotthárd, Sopron, Kőszeg), as well as by Lendava in Slovenia. By contrast, the Hungarian–Croatian border section appears as a relative “no-man’s-land,” where Vienna’s influence remains dominant in the west and Budapest’s in the east, while the role of local centres (e.g. Barcs, Donji Miholjac) is limited.

In summary, the two analytical perspectives employed in this study demonstrate that Hungary’s Schengen border sections exhibit considerable differences in their integration potential. Where higher border-area population concentration is coupled with significant urban gravity, denser and more hierarchical spatial linkages tend to emerge. This pattern characterizes several sections of the northwestern border area as well as large parts of the Hungarian–Romanian border.

Conversely, along border sections where linear population concentration is lower and the spatial organizing role of local urban centres is weaker, the spatial conditions for integration are more limited. Overall, the observed patterns indicate that the effects of Schengen border opening are not uniform across the entire border region, but rather manifest in zones of connectivity with varying levels of intensity and organizational structure.

CONCLUSIONS

The development of European integration and the expansion of Schengen border sections have created a new spatial context for Hungarian border regions. The diminishing role of physical borders sheds new light on the significance of cross-border linkages and border crossing points, as well as on the spatial organizing role of urban centers across different border sections. The Hungarian–Romanian border provides a clear example, having emerged as a zone of connectivity within the EU as a result of spatial structural transformation processes in the Schengen Area.

Our findings highlight territorial concentration as a persistent characteristic of border regions. Gravitational relations are not evenly distributed across space in the examined region but instead exhibit distinct hierarchies. At the macro level, Budapest and Vienna effectively divide most of the examined Hungarian border areas between them in terms of gravitational influence, particularly along sections lacking a dominant local (meso- or micro-level) urban center. In such areas, the influence of more distant macro-centers becomes more pronounced.

In the Hungarian–Croatian border region, for instance, the role of local centers is weak, the border area exhibits a low level of spatial organization, and major local centers appear only sporadically in the urban gravity structure. In contrast, the western part of this border section is dominated by Vienna, while the eastern part is influenced primarily by Budapest. Conversely, the Hungarian–Romanian border section demonstrates that the presence of regional and local centers with sufficient demographic and functional weight supports the emergence of more hierarchical spatial structures, with the border region being covered by local spheres of influence at both meso- and micro-levels.

These findings suggest that the possibilities for cross-border integration are not evenly distributed within the Schengen Area. From a spatial structural perspective, those border sections exhibit higher integration potential where nearby urban centers with significant population concentrations are accessible. By contrast, along more sparsely populated peripheral sections characterized by weak urban networks and underdeveloped transport linkages, the spatial conditions for integration are more limited.

Accordingly, our results do not support the notion of uniform convergence among border regions; rather, they point to the persistence of existing centre–periphery relations even within the more favorable context of Schengen integration.

The patterns identified through the analysis of urban gravity can be interpreted from social, economic, and transport perspectives; however, such interpretations should be approached with cau-

tion. It can be assumed that in regions with large urban centers, daily interactions are more intense, accessibility conditions are more favorable, and denser opportunities for spatial linkages may emerge. Peripheral areas lacking strong local centers, by contrast, may not benefit equally from open borders. For example, regions characterized by significant natural barriers and weak spatial connectivity are less likely to overcome their peripheral position.

Overall, the findings suggest that, in peripheral border areas, Schengen membership alone is insufficient to generate more favorable integration trajectories. This underscores the need for targeted development of cross-border infrastructure, the strengthening of institutionalized cooperation, and the promotion of integration in regions with weaker urban networks. Based on the results of this research, an important direction for future inquiry is to identify the territorial and institutional instruments that may strengthen linkages in less favorably positioned border regions, as well as the methods that may help reduce persistent development disparities rooted in centre–periphery relations.

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APPENDIX

Appendix 1. Schengen border sections and border-area population

County	Border length	Natural border	Conv.	Border-area population	Natural border %	BPCI	Scores	Average
Békés	169	4.5	164.5	154234	2.66	913	1.83	3.07
Csongrád-Csanád	64.2	21.3	42.9	200899	33.18	3129	6.26	
Hajdú-Bihar	91.7	0	91.7	85879	0.00	937	1.87	
Szabolcs-Sz. RO	96.5	0	96.5	112553	0.00	1166	2.33	
Baranya+B-K/2	134	62	72	100013	46.27	746	1.49	1.43
Somogy	142	108	34	49257	76.06	347	0.69	
Zala (SL+HR)	85.4	56.2	29.2	90837	65.81	1064	2.13	2.70
Vas (SL+A)	188.5	89	99.5	180928	47.21	960	1.92	
Győr-Moson-Sopron	238.9	114.4	124.5	416506	47.89	1743	3.49	
Komárom-Esztergom	77.5	77.5	0	230057	100.00	2968	5.94	3.21
Pest	44.2	33.6	10.6	60513	23.98	1369	2.74	
Nógrád + Hev/2	131	123.7	7.3	154884	94.43	1182	2.36	
BAZ + Hev/2+SzSzSK/2	248	162.8	85.2	224571	65.65	906	1.81	
Eszék-Baranya	114	37.9	76.1	61317	33.25	538	1.08	2.55
Kapronca-K.+BB	82.6	48.6	34	67297	58.84	815	1.63	
Medimurje+Varazdin	33.7	33.7	0	114525	100.00	3398	6.80	
Virovitica -Drav.	91.7	91.7	0	62700	100.00	684	1.37	
Prekmurje	87.5	52.8	34.7	82509	60.34	943	1.89	
Arad	121	0	121	234730	0.00	1940	3.88	3.44
Bihar	161	4.5	156.5	325662	2.80	2023	4.05	
Satu Mare	92	0	92	197926	0.00	2151	4.30	
Timiș	47	21.3	25.5	36175	45.32	770	1.54	
Bratislava	7.9	4.2	3.7	425348	53.16	53842	10.00	4.75
Nagyszombat	49	49	0	115544	100.00	2358	4.72	
Nyitra	145	130.8	14.2	174461	90.21	1203	2.41	
Banská Bystrica	183	168.3	14.7	182589	91.97	998	2.00	
Kosice	193	118.8	74.2	445590	61.55	2309	4.62	
Southern Burgenland +Ostst.	118	23.7	94.3	123848	20.08	1050	2.10	2.25
Central Burgenland+NÖS/2	76.3	34.5	41.8	61198	45.22	802	1.60	
Northern Burgenland+NÖS/2+WUS	120	35.5	84.5	183463	29.58	1529	3.06	

Source: own calculation



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Unpacking Cultural and Creative Industries in Non-Metropolitan Spaces: Insights From Longitudinal Analysis

ABSTRACT

Cultural and creative industries (CCIs) are attracting a growing international scholarship including several notable contributions from geographers. This article represents a modest contribution to the emerging and vibrant African scholarship surrounding the creative economy and CCIs. The aim is to unpack the composition and shifting content of the cultural economy and CCIs in a non-metropolitan space in the Global South. The study focuses on Mahikeng which is situated in South Africa's North West province. Within the extant literature on CCIs this research is novel through applying a historical approach based on a longitudinal analysis of the cultural economy over a 50-year period and understanding the different influences shaping its shifting complexion. This historical perspective on CCIs is a contribution of the research and addresses a knowledge gap in that most existing CCI literature research is characterised by a bias towards present-mindedness. The overall historical evolution of CCIs in Mahikeng is a classic illustration of the rise and demise of a cultural economy cluster in a non-metropolitan space. This trajectory of change in the cultural economy and CCIs can only be understood in terms of the critical moments or junctures of political change which impacted the town.

Keywords: cultural and creative industries; Mahikeng, Bophuthatswana, non-metropolitan spaces

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Acknowledgement: The comments received from journal reviewers were most appreciated. Chris Rogerson acknowledges valued inputs made to the paper by Robbie Norfolk, Betty White and L.Gladys Champagne.

INTRODUCTION

Cultural and Creative Industries in Contemporary Economic Geography

According to UNESCO (2013, p. 2) cultural and creative industries (CCIs) are defined as “those sectors of organized activity that have as their main objective the production or reproduction, the promotion, distribution or commercialization of goods, services and activities of content derived from cultural, artistic or heritage origin”. For Valiati (2025, p. 13) the economy of CCIs “is a broad concept encompassing the application of economic science theoretical tools in cultural production, distribution and consumption”. Arguably, the concept recognizes culture as a source of intrinsic value and a driver of economic activity. CCIs are distinguished by the capacity to transform creative and cultural capital through multiple and innovative channels (Pastore & Corvo, 2025). According to the definition used in the European Union the cultural and creative sectors are comprised of all activities based on cultural values or other artistic individual or collective creative expressions (Wolniak & Jonek-Kowalska, 2022). However, it is observed the concept of CCIs remains slippery. Pratt (2005, 2008) alerts us to conceptual tensions, confusion and imprecision surrounding both concepts and policy around CCIs. According to Pinheiro and Hauge (2014, p. 87) “following the UK, Anglo-Saxon countries like Australia and New Zealand, in addition to a number of Asian nations, have all adopted their own definitions and nuances thus resulting in an individualized framing of (approach to) the notion of CCIs”. UNESCO acknowledges the elasticity of its definition and points to “its localization potential depending either on national, regional or local needs, as well as policy and development discourses” (Gerlitz & Prause, 2021, p. 1). Thus, Gurel (2025) can pinpoint worldwide slightly different definitions of CCIs are adopted.

Notwithstanding some definitional ambiguity and the absence of an internationally agreed definition, Virani (2026, p. 1) avers that CCIs as a policy construct “has come a long way in the past 10 years or so and more so since the global pandemic 2019–2021”. It has transitioned from being a construct which required strong advocacy to substantiate itself as a legitimate part of the socioeconomic policy landscape “to become a mainstay and a priority in macro- and micro-economic policy the world over” (Virani, 2026, p. 1). Indeed, according to Colombo (2025, p. 18) CCIs “occupy a pivotal role in contemporary society, serving not only as drivers of innovation but also as profound reflectors and shapers of societal values”. CCIs have been viewed variously as flagbearer for the digital economy, a fix for uneven geographical development, a stimulus for urban regeneration, a motor for economic growth and a basis for addressing inequality, exclusion and marginalization (Lewis, 2025). Komarowski and Lewis (2023, p. 1) opine that during past decades CCIs “have increasingly been recognized for their role in local, regional, national and supranational economies; as drivers of economic growth, development and regeneration; and for their social and cultural impacts on well-being, place making, inclusion, sustainability, diversity and culture”. Huang and Zou (2024) demonstrate the manner in which CCIs contribute to urban and regional innovation.

CCIs are recognized widely “as important actors in contemporary post-industrial knowledge-based economies” (Salvadore & Pappalepore, 2025, p. 2). Since the turn of the 21st century Ma (2022,

p. 597) can observe that “the term Cultural and Creative Industries (CCI) has spread globally as a post-industrial strategy for socio-economic revival”. Domenech et al. (2021, p. 1777) contend that CCIs represent “a powerful resource for improving the well-being of rich and poor places at all geographic scales”. Malisiova and Kostopoulou (2024, p. 4500) maintain that CCIs “are widely acknowledged in academic and policy discourse as fundamental resources for local development”. According to Zemite et al. (2022, p. 1) CCIs are “an important and expanding part of local economies; they are known to engage in innovation and risk taking and thus in exploration of new avenues for development”. Across much of Europe CCIs are viewed as a source of adaptive response to new imperatives arising from economic shocks and as an aid to helping regions to recover (Capello & Dellisanti, 2023). The role of CCIs in driving regional growth is an issue which has galvanized much debate (Dellisanti, 2024; Lazzeretti et al., 2017). Across Europe CCIs emerged as powerful potential catalysts of regional development and revitalization (Kalfas et al., 2024; Maddah & Arauzo-Carod, 2025). CCIs are revealed to significantly enhance job prospects in peripheral regions and function as drivers for social cohesion and cultural identity (Crociata et al., 2025). Internationally, the contribution of CCIs to sustainability and attainment of SDGs has been profiled (Borre et al. 2023; Gao et al., 2024; Kovaitė et al. 2022; Zemite et al., 2022). An extensive literature confirms the relevance of CCIs both for sustainable development (Borre et al., 2023; Salvatore & Pappalepore, 2025, 2026) as well as social innovation (Sica et al., 2025). The relationship of CCIs to well-being is subject of accelerating research attention underlining that CCIs can play a central role in promoting inclusive, resilient and sustainable development (Sanjuán, 2025).

During the past two decades Kalfas et al. (2024, p. 1) observe that “researchers, decision-makers, and interested parties from all over the world have paid close attention to Cultural and Creative Industries (CCIs)” as critical anchors for regional growth and rejuvenation especially in the context of Europe. Moreover, CCIs potentially might assume a major role in programmes for the post-war recovery and reconstruction such as for Ukraine (Arauzo-Carod & Moroz, 2025). Arguably, according to Colombo (2025, p. 18), within an environment of “accelerating global challenges – ranging from climate change and resource depletion to political conflicts and growing social inequalities – the transformative potential of CCIs has never been more evident”. Moreover, it is considered that “by rethinking production processes, consumption patterns, and the narratives we craft around sustainability, the CCIs can lead the charge in reimagining a future that is both equitable and regenerative” (Colombo, 2025, p. 18). For Virani (2026) the growth of CCIs is inseparable from the rise of neoliberal policy regimes and argues that they are co-constituted rather than merely correlated.

Among others, Brandano and Urso (2023) report that for the past 20 years CCIs have been subject to increased academic as well as policy attention. Undoubtedly, public policy interest in CCIs has been a major impetus for the rise of CCI research (Cho et al., 2018; Ericsson et al., 2024; Valiati, 2025; Virani, 2026) and the recent global burgeoning of academic writing on CCIs (Boos et al., 2025; Duester, 2025; Feng & Yang, 2024; Haugsevje, 2024; Kalfas et al., 2024; Lazzeretti, 2013; Simjanovska, 2026). Gerlitz and Prause (2021, p. 1) reflect worldwide scholars “have intensively studied Cultural and Creative Industries (CCIs) within the last 20 years due to their economic growth potential and their positive impacts on innovation, regional competitiveness, identity, and more recently, resili-

ence”. Especially, in the wake of the COVID-19 pandemic CCIs gained further momentum because of policy developments around resilience and economic recovery (Brandano & Urso, 2023; Daniel, 2024; Drummond et al., 2025 Yue, 2022). Within this expansion of CCI scholarship research contributions made by geographers, urban analysts, cultural scholars and regional scientists have enriched and enlarged CCI debates (Brandano & Urso, 2023; Pratt, 2012, 2017).

Andy Pratt (2012, p. 317) early identified that CCIs exhibit “a distinct geography, one that is dynamic and that has until recently been poorly documented and explained”. Over the past two decades a range of issues around CCIs have consolidated as vibrant topics for discussion and research among geographers, urban studies or regional science scholars (Slach et al., 2015). In particular, Pratt (2012, p. 319) observed that geographers assumed a lead role in interrogating “the localisation of the cultural and creative industries, notably with respect to the clustering of these activities”. It was disclosed that CCIs do not locate haphazardly instead they are in specific locations and clusters (Casadei et al., 2023; Gong & Hassink, 2017). In a landmark contribution Comunian et al. (2010, p. 6) remind us of the importance of understanding more deeply the advantages and disadvantages of particular places for CCIs not only in terms of infrastructure but also with reference to “the kinds of networks, policy and market dynamics that they can offer to facilitate the sector”. The location and spatial distribution of CCIs has been garnering major research attention at national, intra-regional and intra-urban scales of analysis (Antonova, 2025; Biferale et al., 2025; Cabrera-Pereyra et al., 2025; Crociata et al., 2025; Daniela et al., 2014; Maddah et al., 2023; Miguel & Herrero-Prieto, 2020; Sekeroglu & Celik, 2025; Uršič, 2016). One central finding is that as a consequence of heterogeneity, different location behaviour is observable among different kinds of CCIs (Dellisanti, 2023a, 2023b) as well as between new enterprise births and the more established CCIs (Cruz & Teixeira, 2024).

The initial wave of research on CCIs stressed that the dependence of CCIs on large pools of creative labour, extensive local networks of suppliers, access to tacit knowledge and synergies based on spatial proximity strengthened their agglomeration in major metropolitan areas. The emerging international consensus was large cities were considered the best environments for CCIs and especially ‘creative cities’ so as to take advantage of their hard and soft infrastructural benefits including of Richard Florida’s ‘3Ts’ – talent, tolerance and technology (Florida, 2002). In turn, the CCIs and skilled labour pools (talent) attract high technology industries to such creative cities thereby promoting further innovation and economic growth. A critical finding was that in order to derive the benefits of economic growth and development, CCIs needed to co-locate in sufficiently high numbers and to form ‘clusters’ which were viewed as a vital aspect in the formation, expansion and success of CCIs. Overall, the initial burst of scholarly outputs around the economic geography of CCIs was centred mainly on clustering which occurred in the contexts of post-industrial cities of the Global North. This Northern ‘urban bias’ was an inevitable result of the original pioneer scholarship on the ‘creative class’ and ‘creative cities’ which emphasized creativity’s role in restructuring the post-industrial urban economy, galvanizing innovation, entrepreneurship, and new seeds of economic growth (Zhao & Kim, 2025). As articulated by Gibson (2010, p. 3) and others (see Drummond, 2026 in the South African case), one outcome of urban bias has been to foster an “imaginary geography of creativity” which situates CCIs and creativity primarily in the urban context to the exclusion and neglect of other spaces.

In recent years the validity of this ‘urban bias’ which coursed through initial economic geography scholarship on CCIs has come under intense scrutiny. Gibson (2012) demonstrated clearly that creativity beyond city limits occurred in many physically and metaphorically remote or marginal spaces. Drummond (2026, p. 1) points out that whilst CCIs are viewed as “quintessentially urban” arguably “this is not the case in reality”. The landmark works of Gibson (2010, 2012) were critical in debunking this imaginary geography of creativity, instead to highlight that CCIs existed across a range of diverse localities outside of major cities in the Global North. A raft of additional studies confirmed that whilst national geographies of CCIs might be dominated by metropolitan areas “the cultural economy also increasingly thrives in a range of smaller and remote cities” (Yin & Derudder, 2021, p. 12). A growing literature affirms that creativity and CCIs are not merely phenomenon of inner-city spaces. Creative economy development beyond the city is the axis of recent detailed work produced by England and Sendra (2026). Accordingly, whilst CCIs traditionally have been seen as a metropolitan phenomenon, this “predominantly stereotyping approach” has shifted in recent years; Zemite et al. (2022) can observe there is a progressive trend for exploring the traits of CCIs in non-metropolitan spaces. Research by Bell and Jayne (2010) flagged issues around ‘the creative countryside’. Duxbury (2021) points to an emerging international conversation surrounding CCIs in rural and remote areas. Mathisen et al. (2024) demonstrate that in peripheral rural areas creativity, cultural livelihoods are possible. The existence of creative activity clusters in small cities and towns of Spain and Latvia has been interrogated respectively by Escalona-Orcao et al. (2018) and Zemite et al. (2022). Rural and small-town Sweden has been the setting for several research studies on CCIs and ‘creative outposts’ in sparsely populated and peripheral areas of the country (Brouder, 2012; Brouder and Eriksson., 2013). Among other geographical studies are works which have been conducted in relatively remote rural towns of Australia (Daniel, 2013, 2014), and Ireland (White, 2010).

Although the original literature and policy concern around CCIs focused on Europe, the issues around CCIs as vital drivers for economic development inevitably experienced an international spread to include the Global South. As observed by Cunningham and Swift (2019) researchers in the Global South have launched research investigations on the CCIs accompanying the adoption of a cultural and creative economy (CE) development agenda. This surge of research and policy interest around CCIs has been manifest also in sub-Saharan Africa (Drummond, 2026; England & Sendra, 2026; Obiaya et al., 2026; Rodygina & Sinilova, 2025). In particular, CCIs in South Africa have been under investigation and where it has been recorded that the creative economy and CCIs are geographically concentrated mainly in the metropolitan centres of Johannesburg and Cape Town (Gregory & Rogerson, 2018). Nevertheless, in other African studies, a burst of new scholarship is interrogating creative economies and CCIs beyond the confines of major cities and urban areas (Drummond, 2026; Drummond & Rogerson, 2025; England & Sendra, 2026). Given this fluidity, Irma Booyens (2025) calls for an urgent reframing of scholarship around the ‘spatiality’ of the creative economy in Africa.

Figure 1. Location Map of Mahikeng in the North West province and Showing Areas of the Former Bophuthatswana Bantustan.



Source: Map prepared by Fiona Drummond

Within these international debates and research on CCIs, this article represents a modest contribution to the emerging and vibrant African scholarship surrounding the creative economy and CCIs. The aim is to unpack the composition and shifting content of the cultural economy and CCIs in a non-metropolitan space in the Global South. The study is focused on Mahikeng which is located in South Africa's North West province (Figure 1). Within the extant literature on CCIs this research is novel through applying a historical approach based on a longitudinal analysis of the cultural economy over time and understanding the different influences shaping its shifting complexion. This historical perspective on CCIs is a contribution of the research and addresses a knowledge gap in that most existing CCI literature research is characterised by a bias towards present-mindedness.

Study Context: Mahikeng in Historical Perspective

A brief overview of major political events which have shaped Mahikeng's development trajectory provides essential context for understanding the changing complexion of the town's cultural economy and CCIs. It should be appreciated also that since its foundation the settlement has experienced several name changes.

The development history of the original settlement of Mahikeng (meaning "the place of stones") is unusual in South Africa as its origins are as an indigenous African (Batswana) settlement established at a reliable source of water on the banks of the Molopo river. Arguably, Mahikeng has long been something other than an ordinary South African town (Parnell, 1986) with its main claim to international fame deriving from the celebrated role played by Colonel Robert Baden-Powell in the Siege

of Mafeking (October 1899-May 1900) by Boer forces during the Second Boer War. Mahikeng has a complex history with the intertwining of Batswana, Boer, and British cultures and powers. Until Botswana's political independence in 1966 and the construction of a new capital, Mafeking served as the extra-territorial capital of colonial Bechuanaland. In 1966, the Bechuanaland Protectorate gained independence from Britain and the capital function relocated to Gaborone in the newly independent state of Botswana. With its capital status lost Mafeking became a peripheral settlement near the border of the Republic of South Africa (Drummond & Manson, 1991; Drummond & Parnell, 1991). Until 1966 Mafeking managed to remain somewhat apart from the strict implementation of apartheid measures as petty apartheid could not be enforced as stringently as elsewhere due to the British colonial presence. However, with the changing political situation between 1966 and 1977 Mafeking experienced the full weight of apartheid segregation, spatial planning and enforcement of petty apartheid legislation.

The implementation of measures for the making of 'grand apartheid', which centred on the creation of separate 'ethno-states' for South Africa's African population, was a watershed in Mahikeng's history. During the 1960s and 1970s, the architects of apartheid sought to stringently enforce racial segregation through a programme of massive social engineering involving the forced removal of Black Africans from 'White' South Africa to their 'traditional' rural 'Homelands' or what were styled as 'Bantustans'. Four Bantustans' (Bophuthatswana, Ciskei, Transkei and Venda) acceded to 'independence' from South Africa and were given budgetary support from the apartheid government in order to support their sham 'independence' status unrecognised by the international community as legal or separate from South Africa.

Undoubtedly, the most successful of these 'independent' Bantustans was Bophuthatswana, the so-called 'traditional homeland' of the Batswana people, which was established in 1977 with its capital at Mmabatho built six kilometres north of Mafeking. The town of Mafeking was not initially part of Bophuthatswana albeit much debate arose as to possible incorporation. Nevertheless, the white inhabitants of Mafeking, led by the business community, expressed support for joining Bophuthatswana in order to regain the prosperity associated with being a capital and that Mmabatho and Mafeking effectively functioned as one urban centre (Drummond & Parnell, 1991). In 1980 the town was incorporated into Bophuthatswana and renamed Mafikeng to move away from the anglicised spelling and better represent the Setswana language. The local newspaper reported as follows: *"From 19 September it will no longer be Mafeking but MAFIKENG.... Although many Mafekingians will be heartsore that the historic name will no longer appear on world maps, Mafikengians on the other hand will rejoice that the original placename has been restored after 95 years of misspelling"* ("It will be Mafeking no longer," 1980). Further it was pointed out: *"An I for an E and an e for an i - just this simple swap and there you have it - Mafeking becomes Mafikeng. ... There is no question of animosity, it only involves going back to the original Tswana name that was distorted so many years ago"* ("Mafeking – so be it," 1980).

The Bophuthatswana 'independence' years triggered an economic boom for Mafikeng/Mmabatho. Underpinning this new prosperity was the South African state pouring heavy economic subsidies into Bophuthatswana in order to achieve its strategic objective of legitimising grand apartheid.

The town of Mafikeng recovered its status as a political capital. Major infrastructure projects were launched associated with the trappings of any capital city of a newly 'independent' African country (Drummond & Drummond, 2021; Nel & Drummond, 2019). Throughout the period 1980 to 1994, the town was a 'Bantustan boomtown' benefitting from its status as political capital and the lavish subsidies received from the South African state (Drummond, 1991a, 1991b; Drummond & Parnell 1991). Importantly, for CCIs and the cultural economy of the town, Bophuthatswana independence was a pivotal moment. In addition to the construction of a new parliament, ministerial and government buildings and airport, the independence period witnessed the establishment of a new university, radio station, music recording studios, a cultural centre for performances, two hotels and sports stadium complex. Significantly, throughout the years of 'independence' Bophuthatswana's President Mangope prioritised the arts and culture sector in Mafikeng as it was regarded as crucial for legitimisation of the bogus state.

Democratic change in South Africa in 1994 and the rise to power of the African National Congress (ANC) closed this era of plenty through the generous apartheid state subsidies that flowed into the town. In the period of democratic transition it was assumed that the Bantustans would be seamlessly re-incorporated into the new South Africa. Nevertheless, this was not the case as intense opposition occurred from the Bophuthatswana authorities in the hope that an independent Bophuthatswana would still be possible (Lawrence and Manson, 1994). This option was not feasible and with the collapse and crushing of opposition, Bophuthatswana was re-incorporated into South Africa (Jones, 1999). This said, the local opposition towards re-incorporation impacted the attitude of the new African National Congress government towards Mafikeng's development. At the time of transition, considerable anxiety existed regarding the town's future. Although Mafikeng was granted the status of provincial capital of the new North West province, negative sentiment resulted in an effective investment strike and sentiment in the town effectively pivoted from boomtown to ghost-town.

With the demise of apartheid and expansion of democracy, the new ANC government dismantled the legacies of the Bantustans, viewed as institutions of apartheid (Drummond & Nel, 2021). One consequence was the loss or degradation of many of Mafikeng's cultural assets. For example, the local orchestra was disbanded and the former Bophuthatswana television and recording studios shut down. In terms of tangible and intangible culture, the town became a shadow of its former self, no longer a cultural melting pot, nor a town with a cultural infrastructure and institutions to support a vibrant CCI economy. Indeed, the town entered an economic slump due to the after-effects of the 2008–2009 global financial crisis. With the ANC government reclaiming the African heritage of South Africa which had been suppressed during both colonial and apartheid rule, the North West provincial government emphasised the town's African Batswana heritage and thus in 2012 returned to the original Setswana spelling of Mahikeng. Locally, an attempt was made to rebrand Mahikeng as South Africa's cultural capital with a focus on new cultural festivals celebrating the Setswana language and resurgence in Batswana culture (Drummond et. al., 2021).

METHODS

This research on Mahikeng's CCI economy uses an historical approach with primary documentary source materials extracted from archives. The pursuit of archival research is a valued research method in geography and most especially in respect of research in historical geography. The merits of utilising archival methods in uncovering various issues in the historical geographical research on tourism in South Africa are demonstrated in several recent studies (Drummond et al., 2021; Drummond et al., 2022; Rogerson, 2020, 2025a, 2025b, 2025c, 2026; Rogerson & Rogerson, 2024a, 2024b, 2025a, 2025b; Sixaba & Sixaba, 2026). Analysis is undertaken of evidence obtained through the archive of the local *Mafikeng Mail* weekly newspaper across the 50-year period, 1974 to 2023. The newspaper collection was investigated both at the *Mahikeng Mail* offices in Mahikeng and at the National Library of South Africa, Cape Town depot; since 2020 the *Mahikeng Mail* is available online.

A longitudinal approach was adopted to track the evolution and changing complexion of the CCI economy and link this to shifts in the political economy. This research method provided longitudinal data across the historical period under scrutiny. Using newspaper sources the archival approach provided information and facilitated the development of a data base on the cultural economy and CCIs in Mahikeng over the 50-year period. The database was constructed based upon the notices of activities taking place in the town's creative sector over this period. Because of its general international acceptance and comparison, as well as broad range of cultural and creative activity classification, the UNESCO (2009) framework was applied to define and capture the CCIs. The UNESCO framework is the standard classification system used in South Africa for defining CCIs and for purposes of statistical analysis. In the Framework for Cultural Statistics (FCS), culture is defined as "the set of distinctive spiritual, material, intellectual and emotional features of society or a social group, that encompasses, not only art and literature, but lifestyles, ways of living together, value systems, traditions and beliefs" (UNESCO, 2009, p. 9). The FCS identifies six 'domains' which give a sense of the structure and breadth of CCIs. These are (1) Cultural and Natural Heritage, (2) Performance and Celebration, (3) Visual Arts and Crafts, (4) Books and Press, (5) Audio-Visual and Interactive Media; and, (6) Design and Creative Services. These six domains are based on the grouping together and consolidation of existing international classification systems such as the International Standard Classification of Occupations for cultural employment (UNESCO, 2009). To avoid double-counting, the FCS categorises items in accordance with the subject rather than the form in which it appears. Thus, whilst music spans both the categories of Performance and Celebration, and Audio-Visual and Interactive Media as it consists of both live performance and recorded music, it is situated in the Performance and Celebration domain (UNESCO, 2009). Allied to these six cultural domains UNESCO identifies the two related domains of (1) tourism and, (2) sports and recreation which include economic and social activities considered partially cultural (UNESCO, 2009). As several large cultural and sporting events have taken place in Mahikeng the domain of tourism is explored in some detail and use is made of the category 'Tourism events' in the database. Salvatore and Pappalepore (2025, p. 6) assert that "CCIs and tourism have an inseparable relationship".

Overall, for the purposes of this research, the term ‘cultural economy’ is adopted because the main CCI activities found in Mahikeng are considered part of the cultural domains based on the above UNESCO definitions. Such activities include the performing arts, festivals, visual arts, broadcast media as well as cultural heritage. Table 1 lists in detail the identified sub-categories that apply to each domain. The sub-categories were based on the UNESCO guidelines as outlined in the FCS (2009) as well as the specific domain activities identified in the archival research. For example, under the category of music in Performance and Celebration are listed several different genres such as classical, modern/contemporary (including popular music like pop, rock, R&B, house, kwaito), traditional, choral and gospel, and jazz. These sub-categories represent the composition of each domain and link to the evolution of the cultural economy in Mahikeng as these sub-categories shift over time.

Table 1. UNESCO Domains Used in This Research

<i>Cultural Domains</i>	Cultural and Natural Heritage	Cultural Heritage Museums Setswana Heritage Afrikaans Heritage Mafikeng Historical Heritage
	Performance and Celebration	Dance Music: classical, modern, contemporary, pop/rock, hip-hop, house, R&B, Kwaito, Motswako, amapiano, African/Afrikaans/ Indian traditional, choral, gospel, jazz Plays, Drama, concerts, circus Festivals Beauty Pageants
	Visual Arts and Crafts	Fine arts Photography Crafts
	Audiovisual and Interactive Media	Film and Video TV Radio
	Books and Press	Book fairs Book launches
	Design and Creative Services	Fashion Shows Graphic Design
<i>Related domains</i>	Tourism	Sports and recreation: events that lead to tourism such as festivals, national sports events and tournaments

Source: Authors

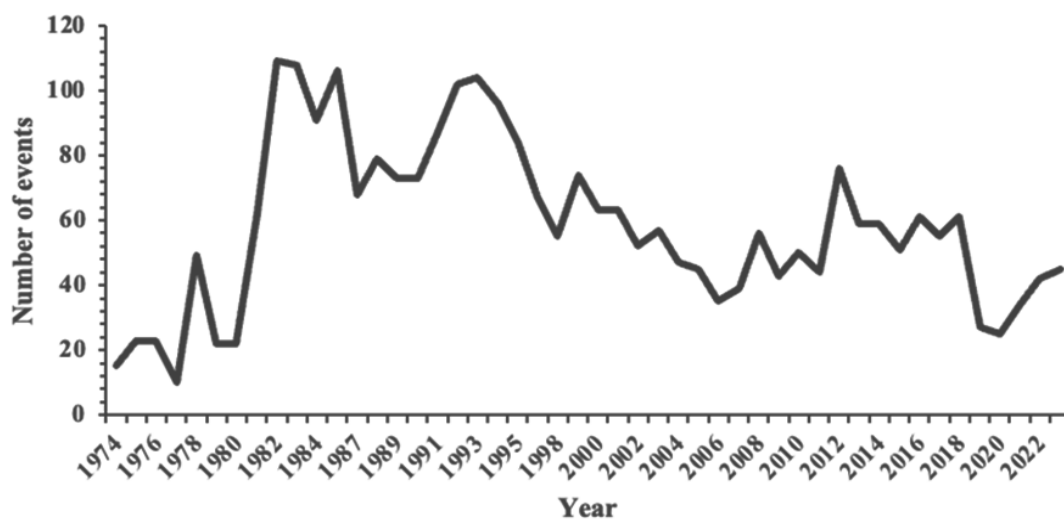
The adoption of the archival approach thus provides information on the local cultural economy and of CCI clustering in Mahikeng over the 50-year period. No other research method could yield data of this type for time-period. Moreover, in taking this historical path, the evolution of the cultural economy can be linked to macro-trends of political shifts. The database was analysed to derive a series of statistical graphs and charts. A detailed and rich tableau of evidence from the archives of the *Mahikeng Mail*³ was generated for analysis.

³ The Mafeking Mail was established in 1899, and in 1900 became the Mafeking Mail and Protectorate Guardian. With the advent of the independence of Botswana in 1966, the paper became the Mafeking Mail and Botswana Guardian. In 1980, following the incorporation of Mafeking into Bophuthatswana, the paper changed to the Mafikeng Mail and Botswana Guardian, in line with what was considered the authentic spelling of the name of the historical town. In

RESULTS

Using the newspaper as resource base, the macro trends in the cultural economy of Mahikeng over the 50-year period can be identified. The total database consisted of almost 3000 data points which provides evidence of changes in the cultural economy of this non-metropolitan space. Figure 2 provides an overview of the cultural economy during the study period in Mahikeng and gives the total number of events in each year. The ‘events’ are classified across the six cultural UNESCO domains as well as the related category for tourism events which includes important events such as national sporting competitions.

Figure 2. Total Number of Events in Mahikeng Cultural Economy 1974–2023



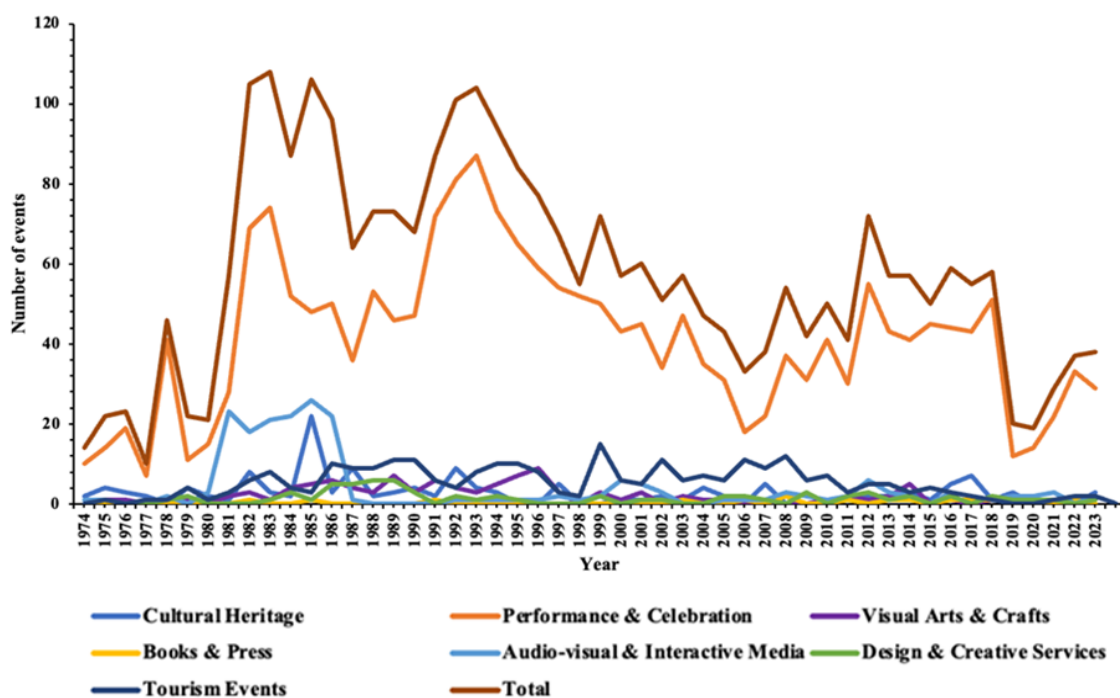
Source: Author Compilation

It is disclosed that from a low base in the mid-1970s prior to the establishment of Bophuthatswana there occurs a sharp upturn following Mahikeng’s incorporation. The peaks of cultural activity occur during the independence and followed by a period of general decline in the democratic era. A marginal revival in activity is evidenced in the early 2010s decade before a steep drop off and recovery linked to COVID. The most significant turning point is Bophuthatswana “independence” in 1977 and the subsequent incorporation of Mafikeng in 1980. The cultural economy experienced a general upward trajectory from 1977 which was driven by government support and investment in cultural infrastructure. In the period 1982 to 1985 the number of events peaked with 108 events being held in 1983. For the next decade the cultural economy exhibits a high-level plateau until 1993 when 104 events are recorded. From that point there is a clear gradual trend down until 2007 with only 38 events being held during the year. In the post-1994 democratic era of South Africa and following the reincorporation of Bophuthatswana with its different priorities and objectives, the new ANC government

1982 it became a newspaper for all Bophuthatswana, and changed name again to The Mail (“The end of an era,” 1982). In 2014 it became the Mafikeng Mail, and in 2015 changed to the new spelling and became the Mahikeng Mail. For clarity, it is referred to as Mafeking Mail (until 1980), Mafikeng Mail (1981–2014) and Mahikeng Mail (from 2015) in line with the spelling of the name of the town.

was not as supportive of the town's cultural economy and this is reflected in the general downward trend of total events. A degree of stabilisation and recovery is discernible from 2008 until 2018, albeit at significantly lower levels than the peak years. The precipitous decline from 2019 to 2021 is attributable to the effects of the COVID-19 pandemic. A small recovery is observed for 2022-2023.

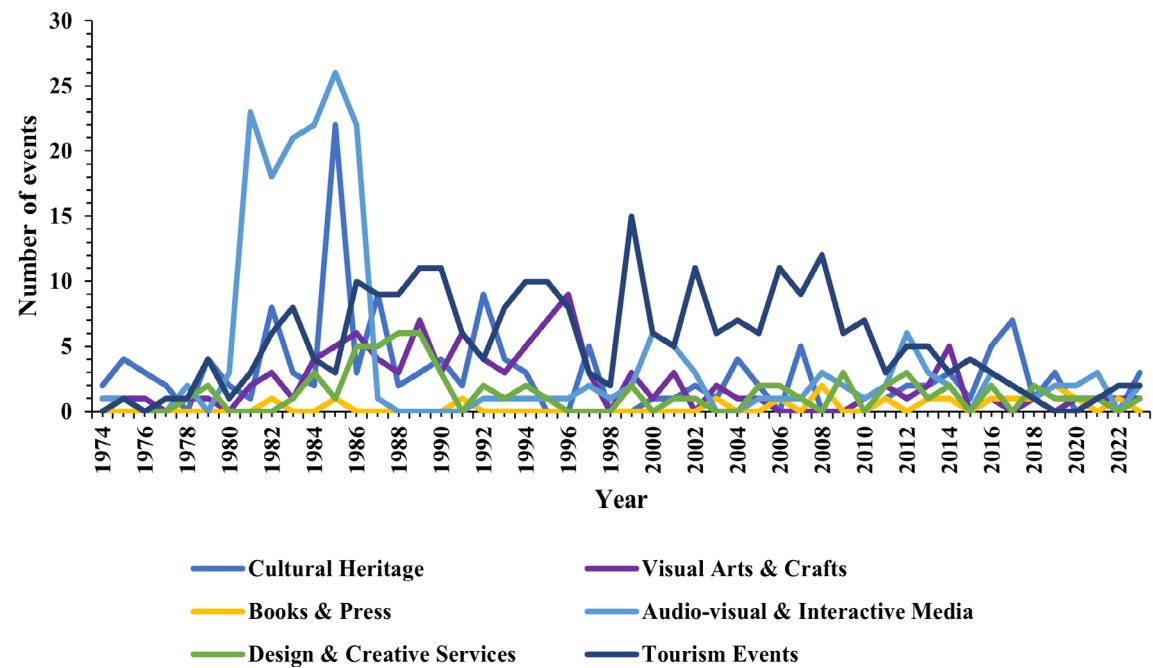
Figure 3. Mahikeng Cultural Economy per Domain, 1974–2023



Source: Author Compilation

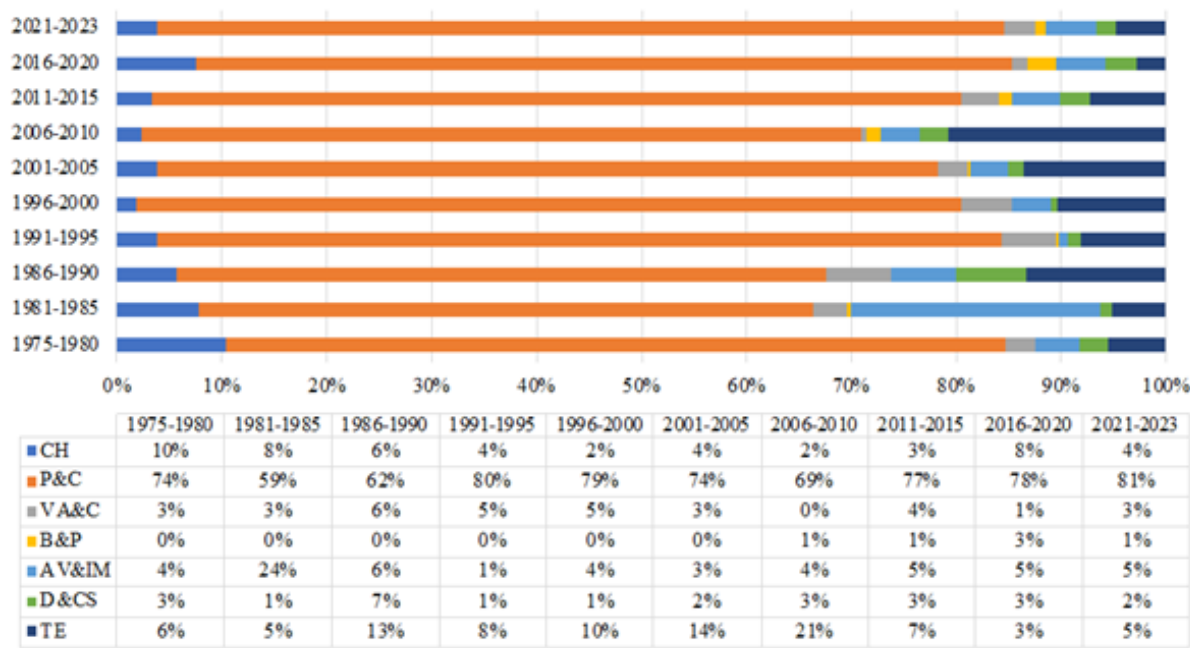
These trends can be unpacked in further detail in terms of the differentiation of the different domains. Figure 3 charts the recorded event by domain across the 50-years investigation. Several points can be noted. First, is to observe that for a former Bantustan capital and now secondary centre in peripheral space on the margins of South Africa, Mahikeng reveals an extraordinary depth and diversity of the cultural economy. Arguably, no other former Bantustan capital, current provincial capital or secondary city in South Africa could match this record. Second, in terms of activities by domain Figure 3 shows clearly the dominance of Performance and Celebration within the cultural economy of Mahikeng. Over the 50-year period are recorded 2062 events in Performance and Celebration which constitutes 72 percent of all cultural activity in the town. Thirdly, Figure 3 indicates the relative contribution of each domain activity and shows that the second largest category is Tourism Events (TE) with 265 events or 9 percent of total activity. The domains of Audio-visual and Interactive Media, Cultural Heritage and Visual Arts and Crafts follow with a share respectively of 7, 5 and 4 percent. The two smallest categories in the town's cultural economy are those of Design and Creative Services, and Books and Press. The smaller domains are represented in Figure 4.

Figure 4. Zoomed in View of Smaller Domains



Source: Author Compilation

Figure 5. Cumulative Percentage Breakdown of Domain Activities in 5-Year Intervals (1975–2023)

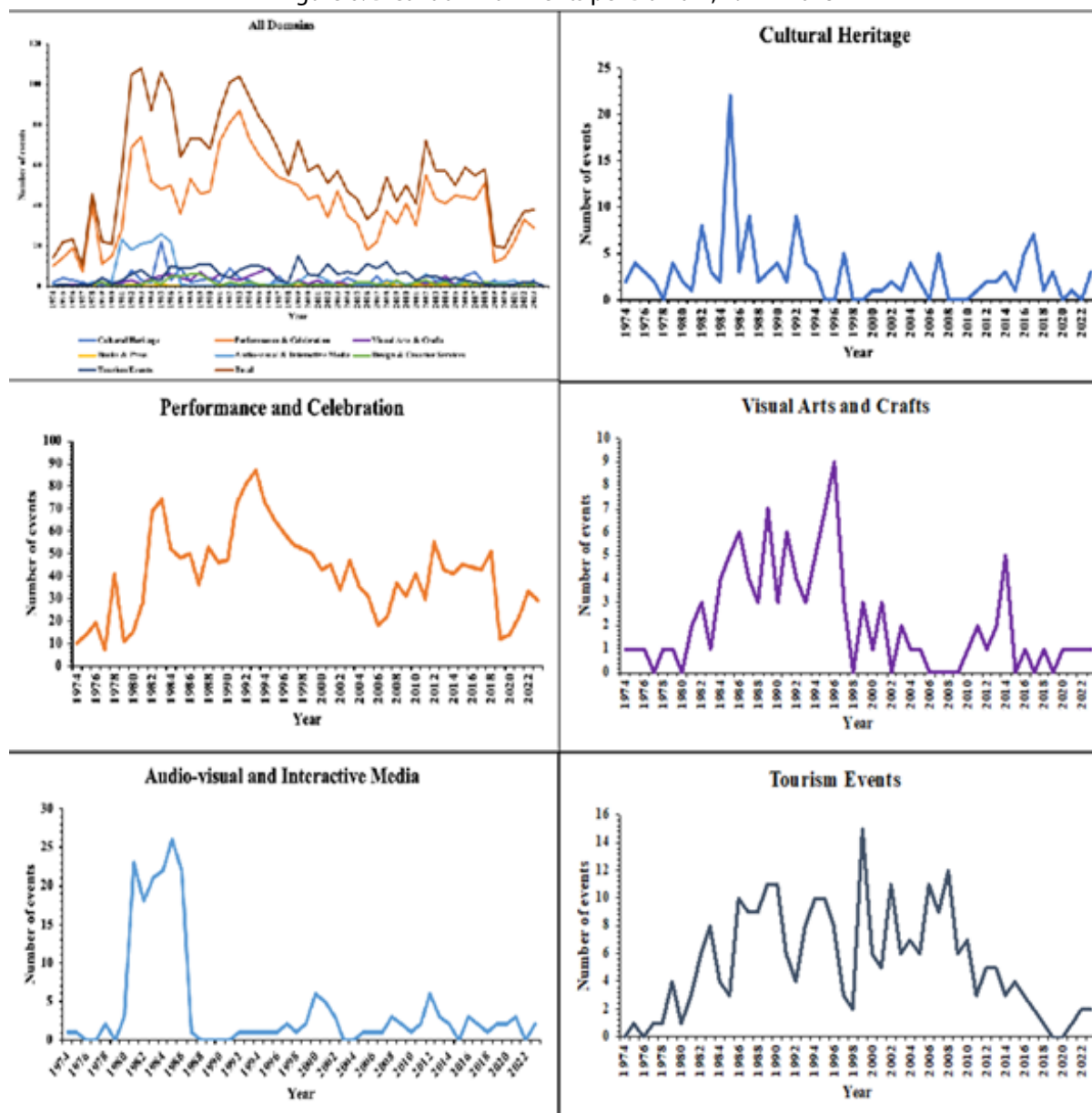


Source: Author Compilation

Using cumulative domain activity across five-year intervals, Figure 5 displays the shifts over time in each domain activity. It is evident that during the peak and plateau of cultural activity in the 1980s to the early 1990s there is a greater degree of diversity in domain activity. Of particular interest is the spike in Audio-visual and Interactive Media during the period 1981-1985 when this domain accounts for 24 percent of total activity. It is disclosed also on Figure 5 that the domain of Tourism Events is

particularly important for the 2006-2010 period accounting for 21 percent of total activity. Further detail of the ebb and flow of activities in each domain across the study period is provided on Figure 6.

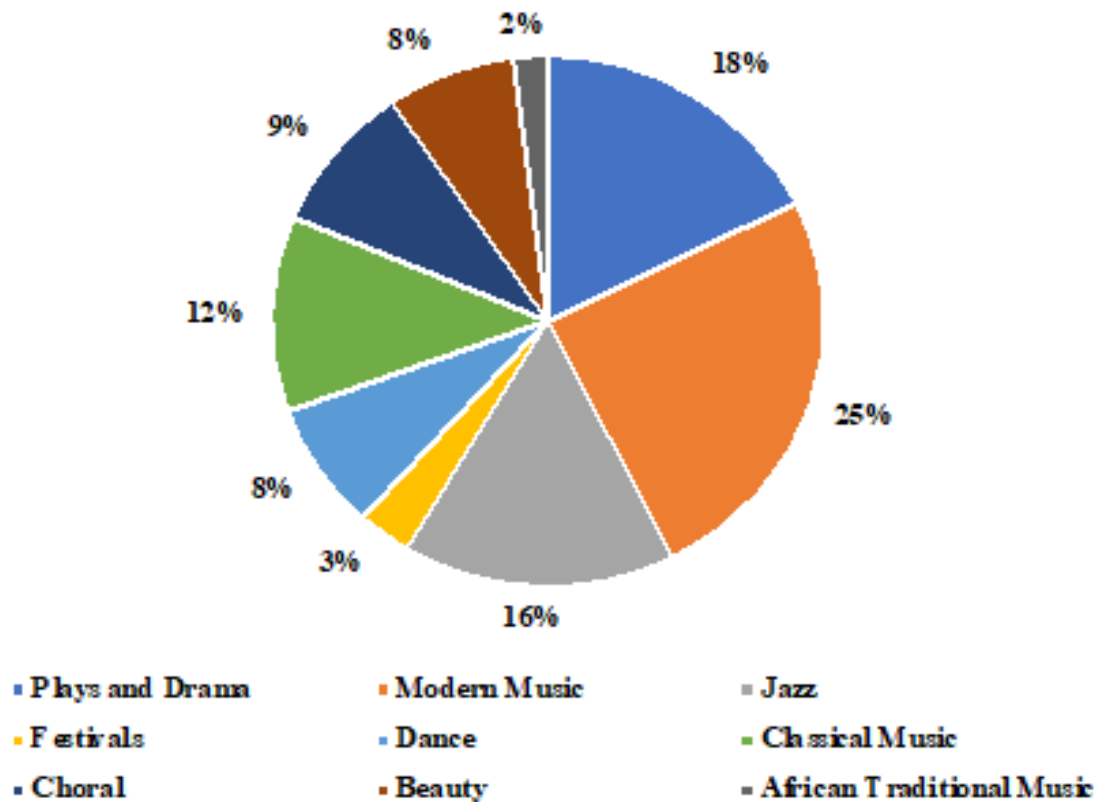
Figure 6. Breakdown of Events per Domain, 1974–2023



Source: Author Compilation

Taken together the analysis provided in Figures 3-6 indicates the dominance of the Performance and Celebration domain throughout the fifty-year period. Indeed, for the local cultural economy of Mahikeng a close association exists between the annual Performance and Celebration domain data and the total number of events over time. This reinforces how important this single domain is to the overall cultural economy of Mahikeng as the main type of CCI activity in the town (Drummond & Rogerson, 2025).

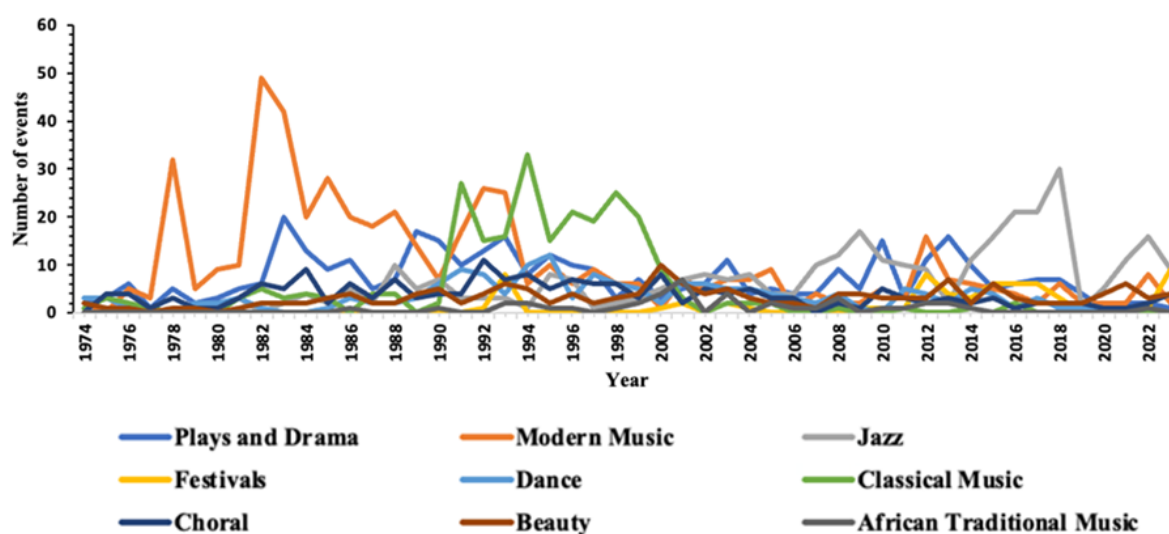
Figure 7. Proportion of total events, 1974–2023



Source: Author Compilation

The data collected from the newspaper archives allows further differentiation of Performance and Celebration domain into its constituent sub-categories as set forth in Table 1, namely Plays and Drama, Festivals, Dance, Beauty Contests and Music. Moreover, given the wide variety of musical genres, the music sub-category was further disaggregated into Modern Music, Jazz, Classical Music, Choral and African Traditional Music. This classification illustrates the wide range of performance events that occurred in the town covering a breadth of genres. As is disclosed on Figure 7 music is the largest category overall as it represents 64 percent of events in the Performance and Celebration domain. Modern Music is the largest musical genre, representing 25 percent of total domain activity and followed by Plays and Drama (18%), Jazz (16%) and Classical Music (12%). Although festivals of music represent only 3% of total domain activity events, it must be highlighted that these are large events such as Mahika Mahikeng with a significant local economic impact on the town (Drummond et al., 2021). Just as the earlier analysis of the UNESCO domains in the cultural economy of Mahikeng pinpointed changes occurring over time a narrowed focus on the category of Performance and Celebration reveals that this has also experienced shifts over time as different sub-components gained and lost in prominence. Arguably, at one level these change over time are a reflection of shifting consumer tastes across the 50-year period but also a reflection of patterns of government funding support for the arts.

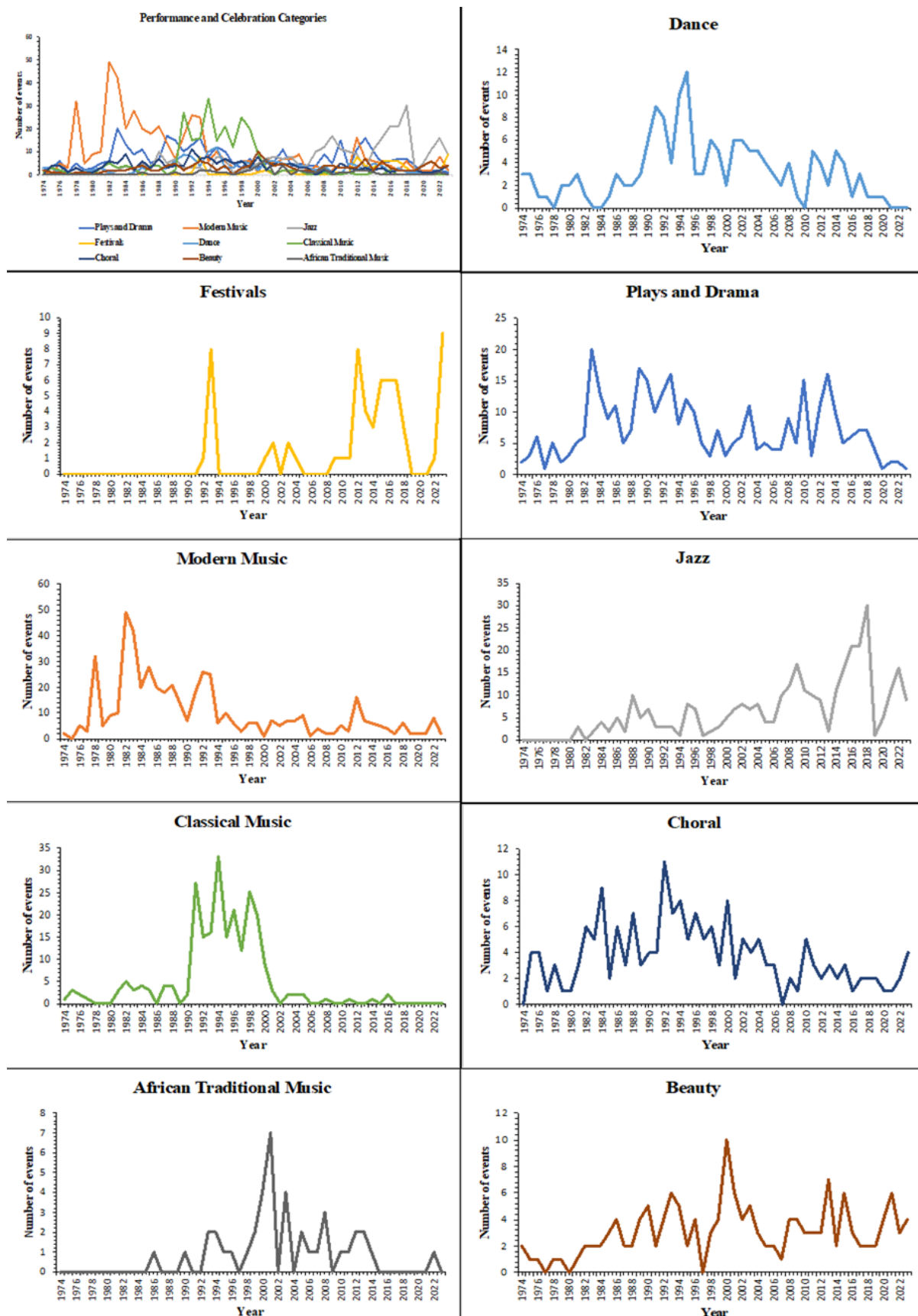
Figure 8. Categories of Performance and Celebration, 1974–2023



Source: Author Compilation

Figure 8 illustrates the patterns over time in relation to these different forms of Performance and Celebration. From Figure 8 it is evidenced that different types or sub-categories of performance peak at different times across the study period. Several points can be highlighted. First, that Modern Music, which includes modern, contemporary, pop/rock, hip-hop, house, R&B, kwaito, *motswako* and *amapiano*, experienced a peak in 1982 and 1983 with 49 and 42 events respectively. A secondary peak was also recorded in 1978 when there were 32 events. Of note is that this secondary peak of modern music occurred during the Bophuthatswana independence era when there was in place a political and development agenda of hosting events for prestige purposes through the attraction of top musicians (Brownell, 2021). Another significant category in the independence years was Plays and Drama, fairly constant through the time period. Second, is the sharp rise and fall of the category of Classical Music from 1991 to 2000. This corresponds to the years between the inauguration and closing of the local Chamber Orchestra. Third, it is observed that Jazz music gained in popularity from 2007 onwards, rising to prominence as the largest sub-category by the decade of the 2010s. Finally, Figure 9 isolates each of the categories of Performance and Celebration allowing the trends over time for each category to be recognised. Details of these categories are discussed elsewhere (Drummond & Rogerson, 2025).

Figure 9. Breakdown of Events per Category of Performance and Celebration, 1974–2023



Source: Author Compilation

CONCLUSIONS

In an international overview of the development of scholarship on CCIs since 2000 Lazzeretti et al. (2018, p. 14) asserts “the increasing relevance of research on CCIs”. This paper represents a modest contribution to the recent burst of global scholarship concerning cultural economies and CCIs. More specifically, it is a response to Fiona Drummond’s (2026, p. 1) observation that “a comparative knowledge gap has formed as the urban bias obscures how non-metropolitan spaces act as important locales of creativity”. Unquestionably, whilst national geographies of CCIs consistently highlight the dominance of metropolitan areas this is not to say that other marginal or peripheral spaces more marginal or peripheral spaces, including non-metropolitan spaces, are not creative. A novel aspect of this contribution is application of an historical approach and use of a longitudinal analysis to unpack the composition and changes taking place over time in cultural economies and CCI activities. Using an historical approach the analysis underlines the dynamic nature and changing complexion of the cultural economy over the 50-year horizon of this investigation. The results of the mining of the archive of the local Mahikeng Mail newspapers provided a comprehensive base for analysing the macro- and micro-shifts occurring in the changing cultural economy of the town. The analysis was conducted through the application of the standard UNESCO cultural domain categories with the addition of the related domain of tourism events. The results disclosed the overwhelming dominance of the domain of Performance and Celebration throughout the study period.

The overall historical evolution of CCIs in Mahikeng is a classic illustration of the rise and demise of a cultural economy cluster in a non-metropolitan space. Arguably, this trajectory of change in the local cultural economy can only be understood in terms of the critical moments or junctures of political change which impacted its rise and fall. It is demonstrated that the rise of Mahikeng’s cluster occurred during the era of the former ‘independence’ of Bophuthatswana from 1977 to 1994 when there occurred substantial government support for CCIs and the construction of an infrastructure which nurtured the expansion of a local cultural economy. In particular, the findings demonstrate the vital importance of infrastructure and generous funding for the arts which was a distinctive feature of the Bophuthatswana era. In effect, the investment in cultural infrastructure projects created a CCIs cluster in the combined town of Mafikeng–Mmabatho. The tangible cultural assets forming the basis for a CCI cluster in the town encompassed a vibrant local newspaper, radio station, and television broadcaster (BopTV); orchestra, dance, drama, and arts and crafts at the Mmabana Cultural Centre; recording studios (where the soundtrack to the Lion King was produced); cultural festivals and, the activities of the University of Bophuthatswana’s fine art department (Drummond & Drummond, 2021).

Post-1994 a dramatic shift occurs in the status of Mahikeng and in the accompanying policy environment that conditioned the cultural economy. It was shown that within an overall trajectory of decline the local cultural economy evidences certain changes in its complexion. The year 1994 saw the re-incorporation of Bophuthatswana into South Africa and marked the start of a steady decline of events held, which bottomed in 2007. This demise in the local creative cluster was largely due to a withdrawal of and reprioritization of funding by the national ANC government. In some cases,

local institutions (the orchestra) and infrastructure (recording studios) closed down; in others such as BopTV and radio these were absorbed into national structures but on a much-diminished scale. Another significant element for change in the cultural economy was the political unrest and the resultant damage to local cultural infrastructure which occurred with the unrest and riots of 1994, and again in 2018.

In final analysis a critical examination of the evolution of the cultural economy in Mahikeng offers certain policy lessons from its historical experience. First, is to highlight that although it was unplanned, a non-metropolitan cluster emerged and consolidated in Mahikeng during the Bophuthatswana era. This confirms the findings of previous research that creative clusters can emerge in non-metropolitan spaces both in the environments of the Global North (Brouder, 2012) and Global South (Drummond & Snowball, 2019). Second, it is important to acknowledge that the Mahikeng cluster was state-led and of the critical significance of government support for the overall development and health of the cultural economy and of its various domains. The analysis confirms that this cluster did not continue to prosper after the state was transformed and was accompanied by the withdrawal of support and funding which, in turn, caused decline, retrenchments and a loss of cultural talent. Lastly, the experience of the Mahikeng cluster shows that following its loss of impetus it has proved difficult to revive. This suggests in policy terms that non-metropolitan cultural clusters require some degree of state support with private sector and community buy-in, as no one sector has been able to successfully take up the mantle and maintain the CCIs cluster without the support of the other.

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A sporttudatos magatartás és az egészségtudatosság térbeli különbségei a fitnessterembe járó sportoló lakosság körében

Geographical Patterns of Health Consciousness Among Fitness Center Users in Hungary

ABSZTRAKT

A kutatás célja annak feltárása, hogy a fitnessterembe járó női sportolók körében milyen térbeli különbségek mutathatók ki az egészségtudatosság és az egészségmagatartás különböző dimenzióiban Magyarországon. A vizsgálat kérdőíves adatfelvételen alapul, 201 fő bevonásával, kényelmi mintavétellel. A változókat településtípus szerint hasonlítottuk össze keresztábrák-elemzéssel, khi-négyzet próbával és ANOVA-val. Az eredmények szerint az attitűdök terén korlátozott térbeli különbségek jelennek meg, míg a viselkedési dimenziókban (szűrővizsgálatok, edzésgyakoriság, táplálkozási szokások, kiegészítőhasználat) markáns város–vidék eltérések figyelhetők meg. A fővárosi és nagyvárosi lakosok magasabb prevenciós aktivitást, tudatosabb étrendet és diverzebb kiegészítőhasználatot mutatnak, míg a kisebb településeken élők esetében strukturális korlátok dominálnak. Az antropometriai mutatók és a testkép nem mutattak szignifikáns térbeli különbséget. Az eredmények rámutatnak, hogy a fizikai aktivitás önmagában nem szünteti meg az egészségmagatartás területi egyenlőtlenségeit.

Kulcsszavak: egészségtudatosság, egészségföldrajz, fitnesstermi sportolók, város–vidék különbség

ABSTRACT

The aim of this study is to explore spatial differences in various dimensions of health consciousness and health behaviour among female fitness gym users in Hungary. The research is based on a questionnaire survey involving 201 participants, selected through convenience sampling. Variables were compared by settlement type using cross-tabulation analysis, chi-square tests, and ANOVA. The results indicate that spatial differences are limited in terms of attitudes, whereas clear urban–rural disparities emerge in behavioural dimensions (screening participation, training frequency, dietary habits, and supplement use). Residents of the capital and larger cities show higher levels of preventive health behaviour, more conscious dietary practices, and more diversified supplement use, while structural constraints are more dominant in smaller settlements. No significant spatial differences were found in anthropometric indicators or body image. The findings suggest that physical activity alone does not eliminate territorial inequalities in health behaviour.

Keywords: health consciousness, health geography, fitness gym users, urban–rural differences

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BEVEZETÉS

Az egészségtudatosság és egészségmagatartás vizsgálata az utóbbi évtizedekben a társadalomtudományi és egészségtudományi kutatások egyik kiemelt területévé vált (Faragó et al., 2019; Kim et al., 2020; Shi et al., 2025). A fizikai aktivitás, a táplálkozási szokások, valamint az egészségmegőrző viselkedésformák együttesen járulnak hozzá az egyének életminőségéhez és egészségi állapotához (Eime et al., 2023; Regis et al. 2016). A fitneszterembe járó sportoló lakosság szempontjából különösen releváns célcsoportot képez, mivel esetükben feltételezhető az átlagpopulációhoz képest magasabb szintű egészségtudatosság, ugyanakkor ezen belül is jelentős különbségek mutakozhatnak.

A jelen vizsgálat kiindulópontja, hogy az egészségmagatartás nem csupán egyéni döntések eredménye, hanem szorosan összefügg a társadalmi és térbeli környezettel (Faragó et al., 2019; Shi et al., 2025). A lakóhely típusa (különösen a város–vidék dichotómia) befolyásolhatja az egészséges életmódhoz való hozzáférést, az információk elérhetőségét, a szolgáltatások színvonalát, valamint a társadalmi normákat (Kumar et al., 2015; Kim et al., 2020). A fővárosi, városi, községi környezet eltérő lehetőségeket kínál és kórlátokat szab a rendszeres testmozgás, a tudatos táplálkozás, illetve az egészségmegőrző magatartás terén. Ennek megfelelően feltételezhető, hogy a fitneszterembe járók egészségtudatossága és kapcsolódó viselkedésmintái térben differenciáltak (Zhang, 2021; Zhong et al., 2022; Waters et al., 2024).

A problémafelvetés alapját az adja, hogy bár a fizikai aktivitás növekvő népszerűsége jól dokumentált jelenség, kevesebb figyelem irányul arra, hogy e populáción belül milyen strukturális különbségek figyelhetők meg (Machado-Rodrigues et al., 2012; McCormack & Meendering, 2015; Kellstadt et al., 2021; Dong et al., 2024). Különösen hiányosak azok a vizsgálatok, amelyek a térbeli dimenziót az egészségtudatosság, a táplálkozási magatartás, az edzési szokások, vagy akár a testkép kontextusában elemzik. Így nem egyértelmű, hogy a rendszeres fitnesztermi aktivitás csökkenti-e vagy eltünteti-e a különböző térségek (pl. város–vidék, fejlettebb–elmaradottabb területek) közötti különbségeket az egészségtudatosságban és életmódban.

A vizsgálat aktualitását több tényező is indokolja. Egyrészt a modern életmódhoz kapcsolódó egészségkockázatok (elhízás, mozgásszegény életvitel, vagy nem megfelelő táplálkozás) továbbra is komoly társadalmi kihívást jelentenek (Tabak et al., 2012; Machado-Rodrigues et al., 2012; Regis et al., 2016). Másrészt a fitneszipar és az egészségtudatos életmódhoz kapcsolódó szolgáltatások gyors bővülése új térbeli mintázatokat hozhat létre az egészségmagatartásban (Newsome et al., 2024). Harmadrészt a testkép és az egészségpercepció kérdése egyre hangsúlyosabbá válik, különösen az urbanizált térségekben, ahol a társadalmi elvárások és a média által közvetített ideálok erőteljesebben érvényesülhetnek (Groesz et al., 2001; Van Den Berg et al., 2007).

A jelen vizsgálat általános célja ezért annak feltárása, hogy a fitneszterembe járó sportoló lakosság körében kimutathatóak-e a lakóhely típusa szerinti különbségek az egészségtudatosság, az edzési és táplálkozási szokások, az egészségmegőrző viselkedés, a kockázattvállalás, valamint az antropometriai és a testképpel kapcsolatos mutatók tekintetében. A kutatás hozzájárulhat annak megértéséhez, hogy a térbeli különbségek milyen módon strukturálják az alapvetően aktív és egészségtudatos populációk

viselkedését, ezáltal alapot teremthet területileg is célzott egészségfejlesztési beavatkozások kidolgozásához.

Ez az általános célkitűzés az alábbi részcélokon keresztül valósul meg. Vizsgáljuk egyrészt az egészségtudatosság és a kapcsolódó attitűdök eltéréseit, különös tekintettel az egészséges életmód fontosságának megítélésére, a táplálkozási tudatosságra és az étrendi preferenciákra. E célkitűzések fókuszába tartoznak tehát alapvetően az értékek, a motivációk és vélekedések. A vizsgálat további célja, hogy az egészségmagatartás komplexebb dimenzióinak elemzése, azaz a táplálkozási és az egészségmegőrző attitűdök (alvás, szűrővizsgálatok) valamint a táplálékkiegészítő-használat térbeli különbségeinek feltárása. Ezzel összefüggésben célunk az is, hogy feltárjuk, hogy a különböző településtípusokban élők edzési szokásai és a szakmai támogatás igénybevétele mennyiben tér el egymástól. Tehát e rész célkitűzés fókuszába a konkrét viseledések, gyakoriságok és egészségmegőrző gyakorlatok tartoznak. Végül célunk annak meghatározása, hogy a településtípus szerinti különbségek megjelennek-e az objektívebb mutatók szintjén is, így az antropometriai jellemzőkben, valamint a testkép alakulásában.

SZAKIRODALMI ELŐZMÉNYEK

Az egészségtudatosság és a sporttudatos magatartás térbeli különbségeinek vizsgálata az elmúlt évtizedekben jelentős fejlődésen ment keresztül. A kutatási fókusz a korai, egyszerű urbanizációs különbségektől fokozatosan eltolódott a komplex, több szinten értelmezhető társadalmi, környezeti és strukturális tényezők irányába. A szakirodalom alapján jól kirajzolódik egy olyan kutatástörténeti ív, amelyben a területiség szerepe egyre hangsúlyosabbá válik, és egyre árnyaltabb értelmezést nyer.

A korai kutatások elsősorban a vidéki és városi lakosság közötti egészségi különbségekre koncentráltak, gyakran normatív megközelítésben, amely a vidéki lakosság hátrányait hangsúlyozta. Már ezekben a vizsgálatokban megjelent az a felismerés, hogy a vidéki populációk egészségi állapota kedvezőtlenebb, amit az alacsonyabb egészségtudatosság, a korlátozott egészségügyi hozzáférés és a kedvezőtlenebb életmódbeli szokások magyaráznak (Townsend et al., 2002; Aljassim & Ostini, 2020). Emellett a vidéki lakosság körében gyakran magasabb a krónikus betegségek előfordulása, valamint bizonyos kontextusokban alacsonyabb a fizikai aktivitás szintje is (Aljassim & Ostini, 2020). A vidéki–városi különbségek az egészségtudatosság szintjén is megjelennek: serdülők körében például alacsonyabb egészségügyi ismeretszint és gyengébb egészségügyi szolgáltatáshasználat figyelhető meg vidéki térségekben (Kumar et al., 2015), míg a vidéki fiatalok esetében komplex, egyéni, társadalmi és egészségügyi rendszerhez kapcsolódó akadályok nehezítik az egészségtudatosság fejlődését (Wahyuningsih et al., 2024).

A 2010-es évek elején a kutatások fókusza a fizikai aktivitás és az egészség kapcsolatának részletesebb feltárására helyeződött különböző térségi kontextusokban. Az eredmények azonban nem voltak egységesek. Egyes vizsgálatok szerint a vidéki fiatalok aktívabb életmódot folytatnak és kevesebb ülő tevékenységet végeznek (Regis et al., 2016), míg más kutatások nem találtak szignifikáns különbséget a fizikai aktivitás szintjében (Tabak et al., 2012), vagy éppen a városi lakosság magasabb aktivitását

mutatták ki bizonyos csoportok esetében (Dong et al., 2024). A vidéki fiatalok körében megfigyelhető kevesebb ülással töltött idő és magasabb fizikai aktivitás háttérében ugyanakkor strukturális tényezők, például a munkavégzés is állhatnak (Regis et al., 2016). Hasonlóan vegyes eredmények születtek a sportolási részvétel és az érdeklődés tekintetében is, ahol a lakóhely szerepe mellett egyéni és társadalmi tényezők is meghatározónak bizonyultak (Chen et al., 2017). Ez az inkonzisztencia rámutatott arra, hogy a város–vidék dichotómia önmagában nem elegendő a sport- és egészségmagatartás magyarázatára.

Ezzel párhuzamosan a kutatások egyre inkább a háttértényezők feltárására irányultak. A szocioökológiai modellek alkalmazása lehetővé tette az egyéni (életkor, nem, jövedelem), a társadalmi (közösségi normák, társadalmi tőke) és a környezeti (infrastruktúra, sportlétesítmények elérhetősége) szintek együttes vizsgálatát (Hoekman et al., 2016). Az eredmények szerint a sportolási különbségek jelentős része nem pusztán a fizikai környezetből fakad, hanem a társadalmi környezet és a közösségi támogatás szerepe is meghatározó. Különösen vidéki közösségekben a sport nemcsak fizikai aktivitásként, hanem közösségépítő és mentális egészséget támogató tényezőként is megjelenik, amely erősíti a társadalmi kohéziót (Leipert et al., 2014).

A fizikai környezet szerepe ugyanakkor új értelmezést nyert a későbbi kutatásokban. A beépített környezet hatásait vizsgáló tanulmányok kimutatták, hogy az urbanisztikai struktúrák közvetlenül befolyásolják az életmódot, a közlekedési szokásokat és a fizikai aktivitást (Zhong et al., 2022). A városi terek, parkok, sportlétesítmények és közösségi helyszínek mind hozzájárulnak az egészségmagatartás alakulásához. Ezzel összhangban az informális sport jelentősége is felértékelődött, amely gyakran spontán módon, köztereken vagy újrahasznosított városi terekben valósul meg, és különösen fontos szerepet tölt be a marginalizált csoportok esetében (Neal et al., 2023). Emellett a sportprogramok egészségfejlesztési eszközként is megjelennek, amelyek akár eltérő földrajzi térségekben – városi és vidéki környezetben egyaránt – képesek javítani a mentális egészségi mutatókat, különösen megfelelő szakmai támogatás és hibrid (online–offline) megvalósítás mellett (Waters et al., 2024).

A kutatások egy másik meghatározó iránya a társadalmi egyenlőtlenségek és a területi különbségek összekapcsolása volt. Egyre több bizonyíték támasztja alá, hogy az egészségtudatosság és a sportolási szokások nemcsak földrajzi, hanem társadalmi-gazdasági tényezők mentén is differenciálódnak. A jövedelem, az iskolai végzettség és a társadalmi tőke jelentős hatással van a sportolási részvételre és az egészségtudatosságra (Shi et al., 2025; Chen et al., 2017). A vidéki térségekben gyakran alacsonyabb az egészségügyi ismeretek szintje és korlátozottabb az információhoz való hozzáférés (Yuan et al., 2015), míg a városi környezetben bizonyos csoportok magasabb egészségtudatosságot mutatnak (Kim et al., 2020). Ugyanakkor a fiatalok körében az étkezési szokások és az önszabályozási stratégiák is összefüggést mutatnak a lakóhely típusával (Gaspar et al., 2014), és a vidéki fiatalok körében az elhízás gyakorisága is magasabb lehet, amely összefügg a fizikai aktivitás és táplálkozás eltéréseivel (McCormack & Meendering, 2015).

A gyermekek és serdülők körében végzett vizsgálatok tovább árnyalták a képet, rámutatva arra, hogy a fizikai aktivitás, az ülő életmód és az egészségi állapot összefüggései szintén térben differenciálódnak. Ezeket azonban erősen befolyásolják olyan tényezők, mint a családi jövedelem, a nem és az életkor (Kellstedt et al., 2021; Machado-Rodrigues et al., 2012). A térbeli különbségek az objektív

mutatók szintjén is megjelennek: serdülők körében kimutatták, hogy a városi fiatalok alacsonyabb BMI-értékekkel rendelkeznek, míg regionális különbségek is megfigyelhetők az antropometriai jellemzőkben (Katanic et al., 2023). A vidéki fiatalok esetében például gyakran magasabb fizikai aktivitási szint, de eltérő szociális és gazdasági korlátok figyelhetők meg.

Az utóbbi évek kutatásai egyre inkább a komplex, rendszerszintű megközelítések felé mozdultak el, ahol a hangsúly nemcsak a különbségek leírásán, hanem azok magyarázatán és a beavatkozási lehetőségek azonosításán van. A közpolitikai megközelítések kiemelik az egészséget támogató környezet kialakításának fontosságát, valamint a sport és a fizikai aktivitás ösztönzésének szerepét (Zhang, 2021; Zhong et al., 2022). Emellett a sport, mint közösségi tér egyre nagyobb figyelmet kap, különösen a mentális egészség és a társadalmi kohézió szempontjából (Eime et al., 2023).

A nemzetközi trendekkel párhuzamosan a hazai kutatások is hasonló fejlődési ívet mutatnak. Az egészségmagatartás jelentőségének hangsúlyozása alapvető kiindulópontot jelentett, amely rámutatott arra, hogy az egyéni életmódbeli döntések kulcsszerepet játszanak az egészségi állapot alakulásában (Boros, 2019). Ugyanakkor ezek a döntések nem függetlenek a társadalmi és környezeti kontextustól, így az egészségmagatartás szorosan összefügg a társadalmi rétegződéssel.

A hazai empirikus vizsgálatok már korán kimutatták, hogy a lakóhely jelentős hatással van a fiatalok életmódjára és egészségmagatartására. A különböző településtípusok eltérő szabadidős mintázatokat és egészségkockázatokat eredményeznek (Keresztes et al., 2006). A regionális szintű elemzések pedig rámutattak arra, hogy Magyarországon jelentős területi egészségyenlőtlenségek figyelhetők meg, amelyek szoros kapcsolatban állnak a gazdasági fejlettséggel. A nyugat–kelet irányú különbségek, valamint az alacsonyabb jövedelmű térségek kedvezőtlenebb egészségi mutatói jól mutatják ezt az összefüggést (Uzzoli, 2016).

A vizsgálatok egyre részletesebb térleptékű elemzések felé mozdultak el, és a városi szintű kutatások feltárták, hogy a városokon belül is jelentős egészségyenlőtlenségek léteznek. Az egészségi állapot és a gazdasági fejlettség között kölcsönös, egymást erősítő kapcsolat áll fenn, amely mind egyéni, mind makroszinten érvényesül (Egri, 2017). Az egészség ebben az értelemben nemcsak következmény, hanem gazdasági erőforrás is.

A legújabb hazai kutatások az egészségtudatosság és a gazdasági tényezők kapcsolatára is rámutatnak. Magyarországon az egészségmagatartás általános szintje elmarad az európai átlagtól, és az egészségtudatosság nem minden esetben függ össze közvetlenül a gazdasági fejlettséggel (Farágó et al., 2019). Ugyanakkor az iskolai végzettség kiemelt szerepet játszik, ami alátámasztja a társadalmi tényezők meghatározó jelentőségét.

A jelen kutatás célkitűzései szervesen illeszkednek az egészségtudatosság és egészségmagatartás vizsgálatának fejlődési ívébe, amely az egyéni szintű megközelítésektől a komplex, térbeli és társadalmi meghatározottságok felé mozdult el. Az egészségmagatartás meghatározó szerepe (Boros, 2019) rámutat arra, hogy az életmódbeli tényezők alapvetően befolyásolják az egészségi állapotot, ugyanakkor ezek mintázatai társadalmi és strukturális tényezők mentén különböznek. A lakóhely szerepét hangsúlyozó kutatások igazolták, hogy a különböző településtípusok eltérő életmódmintákat eredményeznek (Keresztes et al., 2006), míg a regionális vizsgálatok az egészségi állapot és a gazdasági fejlettség térbeli összefüggéseire mutattak rá (Uzzoli, 2016; Egri, 2017). Ugyanakkor az

egészségtudatosság és gazdasági tényezők kapcsolata nem minden esetben egyértelmű (Faragó et al., 2019), ami indokolja annak vizsgálatát, hogy egy aktív, fitneszterembe járó populációban hogyan jelennek meg ezek a különbségek az életmód és az egészségmagatartás dimenzióiban.

A kutatás innovativitása abban rejlik, hogy a korábbi, általános populációra fókuszáló vizsgálatokkal szemben egy specifikus, sportoló célcsoportra koncentrál, és ezen belül vizsgálja a térbeli különbségeket. Emellett komplex megközelítést alkalmaz: az attitűdök és viselkedések mellett objektívebb mutatókat (pl. antropometria, testkép) is bevon, valamint az egészségmagatartás több dimenzióját (edzés, táplálkozás, alvás, szűrővizsgálatok, kiegészítő-használat) integráltan elemzi. Ez lehetővé teszi a mélyebb összefüggések feltárását és a területileg célzott egészségfejlesztési beavatkozások megalapozását.

MÓDSZEREK

A vizsgálat során az adatgyűjtéshez kérdőíves vizsgálatot alkalmaztunk, amely több részből állt. A vizsgálat kényelmi, önkéntes mintavételen alapult. A kutatás célcsoportja a női fitnesztermi sportolókra irányult. A vizsgálatban összesen 201 fő vett részt. Beválasztási kritériumként szerepelt, hogy a megkérdezettek minimum két éve végezzenek edzőtermi súlyzós edzést. Kizárási kritériumként pedig azt határoztuk meg, hogy a konditermi súlyzós edzéseken kívül más rendszeres fizikai aktivitást ne végezzenek. A vizsgálat során két kérdőívet alkalmaztunk, amelyet országosan Google Forms használatával online elérhetővé tettünk. A kérdőívek kitöltésére 2025. március 23-a és 2026. január 9-e között volt lehetőség.

Az adatgyűjtés több csatornán keresztül történt: egyrészt személyesen, pécsi edzőtermekben töltöttük ki a kérdőíveket a résztvevőkkel, másrészt online, a célcsoportot tömörítő közösségi médiás csoportokban is megosztottuk azokat. Emellett felvettük a kapcsolatot a Magyar Fitness és Testépítő Szakszövetséggel is, akiket megkértünk arra, hogy a kérdőívet minél szélesebb körben juttassák el tagjaikhoz a nagyobb elemszám és a reprezentatívabb minta elérése érdekében.

A felméréshez alkalmazott saját szerkesztésű nyílt, zárt és Likert-skála kérdéseket tartalmazott. A kérdőív első részében a szociodemográfiai adatokat mértük fel, a második részében az általános egészségtudatosságra és egészségmegőrzésre irányuló kérdéscsoport következett. A harmadik kérdéscsoport a kitöltők étrendi tudatosságára vonatkozott. A negyedik részben a kitöltő táplálékkiegészítő-fogyasztási szokásait vizsgáltuk.

A Likert-skálás kérdéseknél hatos beosztást alkalmaztunk, hogy elkerüljük a középérték választásának lehetőségét, így ösztönözve a válaszadókat egyértelműbb állásfoglalásra.

A testképpel kapcsolatos vizsgálatok során egy sportpszichológusok által létrehozott validált kérdőívet használtunk (BSQ-34) (Cooper et al., 1987). A 34 kérdésből álló önértékelés a testalkattal kapcsolatos elégedetlenséget méri. Minden válasz egy hatpontos Likert-skálán értékelhető. Az összpontszám a válaszok pontszámainak összege, így a lehetséges tartomány 34 és 204 között van, ahol a magasabb pontszám nagyobb mértékű testelégedetlenséget jelez. A kérdőív kiértékelése során kapott eredmények a következők lehetnek: ≤ 110 pont: nincs, vagy minimális testalkattal kapcsolatos

elégedetlenség, 111–140 pont: enyhe testalkat miatti elégedetlenség, 141–170 pont: mérsékelt testalkat miatti elégedetlenség, ≥ 171 pont: súlyos testalkat miatti elégedetlenség.

A vizsgált célcsoport szociodemográfiai adatait az 1. táblázat mutatja be. A résztvevőknek lehetőségük volt kihagyni a jövedelmükre vonatkozó kérdést. A megkérdezettek 13 %-a ($n = 26$) nem válaszolt erre a kérdésre, míg 2% ($n = 4$) eltartottként jelölte meg magát. A kitöltők településtípusonkénti térbeli megoszlását az 1. ábra mutatja. A válaszadók településtípus szerinti megoszlása alapján a minta legnagyobb részét városok és megyei jogú városok lakói adják, mellettük jelentős arányban szerepelnek a fővárosiak, valamint kisebb arányban a falvak és nagyközségek lakói.

1. táblázat: A vizsgálati személyek megoszlása főbb szociodemográfiai jellemzőik szerint
Table 1. Distribution of Participants According to Their Main Sociodemographic Characteristics

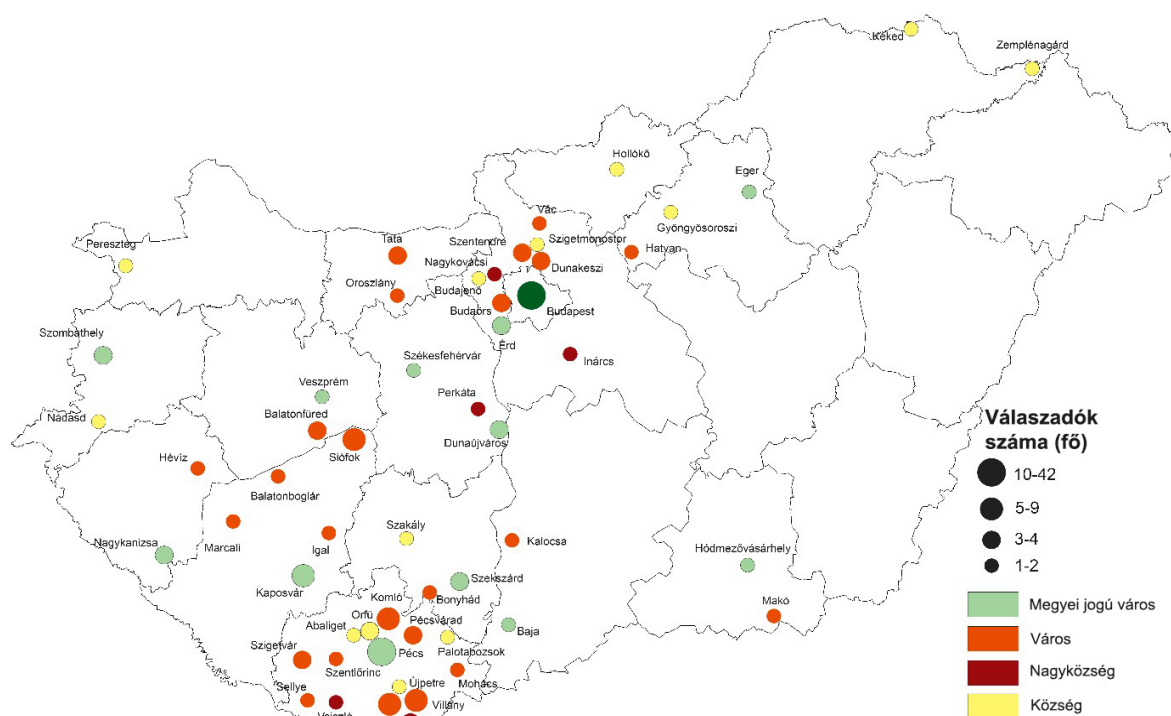
Kategória megnevezése	Csoportok	Válaszadók megoszlása (%)
Korcsoporthok (év)	21–25	44
	26–30	14
	31–35	15
	36–40	9
	40–45	18
Legmagasabb iskolai végzettség	PhD-fokozat	1
	Egyetem	49
	Gimnázium	28
	Szakközépiskola	16
	Szakiskola	3
	Általános iskola	3
Lakóhely típusa	Város	38
	Megyei jogú város	33
	Főváros	13
	Nagyközség	7
	Község	9
Havi nettó jövedelem (EUR)	0–500	13
	501–1000	26
	1001–1,500	36
	1,501–2,500	9
	2,500 felett	1
	Eltartott	2
	Nem válaszolt	13

Az adatok statisztikai elemzéséhez leíró statisztikát, keresztábra-elemzést, valamint khi-négyszet próbát alkalmaztunk. A keresztábra-elemzés a változók közötti kapcsolat irányának és mintázatának feltárására szolgált, egyúttal lehetővé tette, hogy egyidejűleg vizsgáljuk a két változó együttes eloszlását. Ennek keretében minden egyes vizsgált egészségmagatartási, egészségtudatossági és antropometriai változót a lakóhely típusával (amelyet három dimenzióban, főváros, város, község felbontásban mértünk) vetettünk össze. A keresztábra-elemzéshez kapcsolódó statisztikai szignifikancia vizsgálatához Pearson-féle khi-négyszet próbát alkalmaztunk. A jelenlegi, valamint a valaha

mért legmagasabb testtömegindex (BMI) és a lakóhely típusa közötti összefüggés vizsgálatához egy-
szempontos varianciaanalízist (one-way ANOVA) alkalmaztunk. Az ANOVA alkalmas arra, hogy
egyszerre több csoport – jelen esetben a különböző településtípusok – átlagértékei között fennálló
különbségek statisztikai szignifikanciáját meghatározza. A szignifikanciaszintet valamennyi vizs-
gálati dimenzióánál $p < 0,05$ értéknél határoztuk meg. Az elemzéseket az IBM SPSS Statistics 22.0
szoftverrel végeztük el.

1. ábra: A válaszadók településtípus szerinti megoszlása

Figure 1. Distribution of Respondents by Settlement Type



Megjegyzés: A résztvevők száma esetében az osztályképzés nem egyenlő intervallum- és nem kvantilisalapú, az adatok erősen jobbra ferde eloszlásához igazított, közel logaritmikus jellegű bontás, folytonos intervallumokkal. *Note:* The classification of participants is not based on equal-interval or quantile grouping, but on a near-logarithmic categorization with continuous intervals, adjusted to the strongly right-skewed distribution of the data.

EREDMÉNYEK

Az egészségtudatossághoz kapcsolódó attitűdök

A vizsgálat központi elemét adó területi–közigazgatásföldrajzi dimenzió, illetve az egészségtudatos-
ság és a hozzá kapcsolódó attitűdök (életmód, edzésmotiváció, étrend) között egy esetben figyelhetünk
eg statisztikailag szignifikáns kapcsolatot⁴, mégpedig az egészségtudatos életmód fenntartásának

⁴ Pearson-féle Khi-négyzet: 25,731, df: 8, $p=0,001$

fontossága kapcsán. A nagyvárosi, különösen a fővárosi népesség általában magasabb jövedelmi és iskolázottsági szinttel rendelkezik (Kosztyán et al., 2021), ami szoros kapcsolatban áll többek között az egészségtudatossággal. A magasabb iskolai végzettség növeli az egészséggel kapcsolatos információk befogadásának képességét, míg a kedvezőbb jövedelmi helyzet lehetővé teszi az egészséges életmódhoz szükséges erőforrások (minőségi élelmiszerrel, sportolási lehetőségek, szűrővizsgálatok) elérését. Ezzel szemben a kisebb településeken élők körében gyakrabban jelennek meg alacsonyabb státuszú csoportok, ahol az egészségtudatos életmód fenntartása nem feltétlenül prioritás, ráadásul sokszor anyagi és időbeli korlátokba ütközik.

Településföldrajzi szempontból a szolgáltatások térbeli elérhetősége erősen differenciált, hiszen a városokban fejlettebb az egészségügyi infrastruktúra, több a precenziós program, a fitneszlehetőség, valamint az egészségtudatosságot támogató önkormányzati és civil kezdeményezés (Uzzoli, 2001, Bálint et al., 2021). A községekben ezzel szemben gyakran még az alapellátás is hiányos, a távolságok is nagyobbak, korlátozottabb a választék, amely objektív értelemben is csökkenti az egészséges életmód megvalósíthatóságát. A településtípus tehát nem csak a társadalmi–gazdasági pozíciókat és az infrastruktúra területi differenciáit határozza meg, hanem befolyásolja az egyének erőforrásait és lehetőségeit. Mindez hat az egészséggel kapcsolatos tudásra, attitűdökre és normákra is, amelyek az egészségtudatos életmód fontosságának megítélésében fejeződnek ki. Tehát többről van szó, mint egyéni preferenciákról, hiszen a lakóhely által közvetített lehetőségek és korlátok befolyásolják, hogy ki mennyire tartja reálisan elérhetőnek, és ezáltal fontosnak azt.

2. táblázat: Az egészségtudatosság változóinak legkedvezőbb kategóriájába tartozó válaszok aránya településtípusonként

Table 2. Proportion of Responses in the Most Favorable Category of Health Awareness Variables by Settlement Type

Egészségtudatossági változók	Szignifikáns összefüggés	Község	Város	Főváros
Az egészségtudatos életmód fontossága	+	33%	52%	69%
Az egészség mint a testmozgás elsődleges motivációja	-	16%	17%	19%
A kiegyensúlyozott étrend fontossága	-	75%	88%	92%
Az egészségtelen zsírok és az üres kalóriák kerülése	-	75%	66%	78%
Gyümölcs- és zöldségfogyasztás	-	95%	97%	97%
Az ártalmas adalékanyagok miatti aggodalom	-	45%	51%	30%
Az étrend-kiegészítők kiválasztásának szempontjai	-	41%	39%	40%
A negatív mellékhatások elfogadása	-	70%	62%	54%

Az egészségmagatartás komplex dimenziói

A településtípus és az egészségmagatartás, fentieknél komplexebb dimenziói (alvásminőség és -mennyiség, szűrővizsgálatok, étrendi kockázatok, diéta, táplálékkiegészítők-használatának gyakorisága és gyakorlata) kapcsán több esetben találtunk statisztikailag szignifikáns kapcsolatot. Ezek közül kiemelendő az egészségügyi szűrővizsgálatokon való részvétel gyakorisága, az egyén fizikai

állapotának folyamatos figyelemmel kísérése⁵. Ez a változó kiemelten erős fővárosi dominanciát mutat. Azok a társadalmi–gazdasági különbségek, amelyek többek között az iskolázottsági szint és a jövedelmi viszonyok különbségeiből adódnak és együtt járnak az egészségmegőrzés iránti nagyobb tudatossággal hasonló módon hatnak a preventív szolgáltatások igénybevételének gyakoribb megjelenésével (Horzsa et al. 2024; Markos et al., 2025; Katona et al., 2021). A magasabb státuszú csoportok nem csak jobban ismerik a szűrővizsgálatok jelentőségét, hanem nagyobb valószínűséggel rendelkeznek olyan erőforrásokkal (kiegészítő egészségbiztosítások, szélesebb körű magánegészségügyi szolgáltatások), amelyek lehetővé teszik a rendszeres részvételt. Ezzel szemben a kisebb településeken gyakoribb az alacsonyabb jövedelmű, fizikai munkát végző, vagy bizonytalan foglalkoztatású csoportok jelenléte. Számukra a mindennapi kiadások elsődlegesek és még az ingyenes szűrővizsgálatok is az utazás, a kieső munkanap a várakozási idő miatt közvetett költségekkel jár (a prevenció halasztható tevékenységként jelenik meg). Ezt erősíthetik az időgazdálkodás és a munkaszervezés nehézségei. A kistelepüléseken élők gyakran ingáznak, ami napi több órát is igénybe vehet. A rugalmatlan munkaidő, a több műszakos foglalkoztatás, vagy az alkalmi munka, kiegészülve a háztartási és családi kötelezettségekkel, szűkítik a lehetőségeket. A szubjektív szempontok mellett az objektív tényezők is fontos magyarázó rövel bírnak, mivel a diagnosztikai központok és a szervezett szűrőprogramok is a nagyobb városokban koncentrálódnak.

Szignifikáns statisztikai kapcsolat volt kimutatható továbbá a településtípus és a fitneszterembe járó lakosság edzésgyakorisága között, ennek egyik legkézzelfoghatóbb alapja a helyben elérhető sportolási infrastruktúra megléte vagy hiánya⁶. A nagyobb városokban nem csak a fitnesztermek sűrű megjelenése, hanem a szervezett mozgásformák a csoportos órák, a személyi edzők elérhetősége is rugalmas kínálatot biztosít. Ez nem csak több választási lehetőséget jelent, hanem azt is, hogy az edzés könnyebben illeszthető a napi rutinba. A falvakban ezzel szemben vagy hiányzik a szervezett kínálat, vagy csak korlátozott formában érhető el (egyetlen terem, szűk nyitvatartással). Így az edzés inkább egyéni döntés és szervezés kérdése, ami alacsonyabb rendszerességet eredményez.

A településtípus szignifikás összefüggést mutatott a kevésbé szigorú étrendi periódusok gyakoriságával⁷. A csalónapok gyakorisága mögött elsőként az étkezési környezet struktúrális és területi különbségei ragadhatóak meg. A nagyvárosi térben jóval sűrűbb az éttermi, streetfood és a házhozszállítási kínálat, amely folyamatos ingerterhelést jelent, megkönnyítve a diétától való alkalmi eltérést. Ugyanakkor erősebb a „tisztá étkezés” normája, így a lazítás sok esetben tudatosan időzített. Kevésbé esetleges. A kisebb településeken a választék szűkösége miatt az étkezések inkább háztartási keretek között zajlanak, ami ritkább, bár sokszor nagyobb kalóriájú kilengéseket eredményezhet.

A különbségekhez hozzájárul még a társas környezet és a napi időrend szerkezete is. A városokban gyakoribbak a munka utáni közös sok esetben kivételes étkezések. Ezek ismétlődése szintén növelheti a gyakoriságot. Mivel a fitneszkultúra legitimálja a tervezett eltéréseket, így a válaszadók nagyobb valószínűséggel azonosítják őket csaló napként. A falvakban a közös étkezések ritmusa eltérő (családi alkalmak, ünnepek) és kevésbé jelenik meg az a fogalmi keret, amely a diétát és a kivételt explicit módon szétválasztja.

⁵ Pearson-féle Khi-négyzet: 12,953, df: 6, p=0,044

⁶ Pearson-féle Khi-négyzet: 18,530, df: 8, p=0,018

⁷ Pearson-féle Khi-négyzet: 11,030, df: 4, p=0,026

A különbségekhez hozzájárul a mindennapi mobilitási mintázat is. A városban élők esetében az edzés gyakran „út közben” történik (munka után, munkahely, lakóhely közelében), míg a falvakban élőknel az ingázás időigénye beszűkíti a szabadon felhasználható időablakokat. Ha az edzéshez külön utazás is szükséges, az jelentősen csökkentheti a heti alkalmak számát. Fontos megemlíteni, hogy a fizikai aktivitás nem azonos az edzéssel, a falvakban élők körében a mindennapi mozgás akár gyakoribb is lehet, de ez nem feltétlenül jelenik meg strukturált, heti rendszerességű edzésként.

A diétakövetés és a településtípusok között szintén szignifikáns kapcsolat volt kimutatható⁸. Az eltérések részben abból adódhatnak, hogy mennyire hozzáférhetőek a speciális étrendekhez szükséges feltételek. A nagyvárosokban szélesebb a kínálat a funkcionális élelmiszerekből (gluténmentes, laktózmentes, paleo, ketogén, vegán) több a dietetikai tanácsadás, vagy az edzéshez kapcsolódó táplálkozási szolgáltatás. Egyrészt megkönnyíti egy adott diéta kivitelezését, másrészt stabil utánpótlást tesz lehetővé (személyre szabott étrend, rendszeres kontrol). Kisebb településeken a választék szűkebb, a beszerzés időigényesebb, ami növeli a diéták fenntartási költségét is. Így az inkább eseti, vagy rövid ideig tartó.

Légyeges különbség adódik a szakmai és információs környezetből is. A városi terekben könnyebb a kapcsolódás akár a dietetikusokhoz, vagy az online fitneszközösségekhez, amelyek révén konkrét portokok és visszajelzések állnak rendelkezésre. A kisebb településeken gyakrabban jellemzőbb a hagyományos étkezési rend. Kevesebb a külső kontrol. Így a válaszadók egy része nem feltétlenül azonosítja a saját gyakorlatát diétaként, még akkor sem, ha bizonyos korlátozásokat alkalmaz.

Az egészségmagatartáshoz kapcsolódó komplex attitűdök statisztikai elemzése során további szignifikáns kapcsolat volt kimutatható a településtípus és a vitaminok, illetve ásványianyag-készítmények használata között⁹. Bár e készítmények a leggyakrabban használt és legszélesebb körben elfogadott táplálékkiegészítők, fogyasztási mintázatukban élesen kirajzolódik a területi egyenlőtlenség. A nagyvárosban élő, edzőterembe járó sportoló lakosság körében tapasztalt magasabb használati arány összefüggésben áll a fentebb már említett preventív szemléletmóddal. A készítményeket nem csak csupán hiányállapotok kezelésére, hanem a városi életmóddal járó negatív hatások ellensúlyozására is használják. A városi válaszokban megjelenő, sokszor célzott és kombinált készítmények (pl. D3–K2, Q10, ashwagandha, omega-3, shilajit, berberin, inozitol, ginkgo, kollagén, különféle ásványi anyagok és funkcionális kiegészítők) arra utalnak, hogy a használat differenciáltabb, és gyakran konkrét élettani funkciókhoz vagy teljesítménycélokhoz igazodik. Ezzel szemben a falusi mintázat inkább az alapvitaminokra (C-, B-, D-vitamin) és néhány általános ásványi anyagra (vas, magnézium) koncentrálna, ami egy kevésbé specializált, inkább általános egészségmegőrzésre irányuló megközelítést jelez. Itt is fontos szempont az iskolázottság, amely magasabb szintű egészségműveltséget eredményez. Ez képessé teszi az egyént a különböző mikrotápanyagok felismerésére.

Már kisvárosi környezetben is jól kirajzolódik a beszerzési források nagyobb sűrűsége (drogériák, bioboltok, gyógyszertárak), amely ösztönzően hat a rendszeres fogyasztásra. Ezzel szemben a kisebb településen élő sportoló lakosság körében a vitaminhasználat esetlegesebb, többek között a kedvezőtlenebb jövedelmi viszonyok miatt e készítmények vásárlása háttérbe szorulhat a halaszthatatlan napi

⁸ Pearson-féle Khi-négyzet: 7,549, df: 2, p=0,023

⁹ Pearson-féle Khi-négyzet: 6,151, df: 2, p=0,046

kiadások mögött, és sokszor csak szezonálisan (influenzaszezon) jelenik meg. A falvakban kevésbé vannak jelen, vagy teljesen hiányoznak azok a lokális marketingingerek, amelyek a nagyvárosi fogyasztói kultúrában általánosak, megszokottak. A lakóhely tehát meghatározza azt az anyagi és információs mozgásteret, amelyben az egyén a mikrotápanyag-pótlást mint az egészségmegőrzés eszközét alkalmazni tudja.

A településtípus szignifikás összefüggést mutatott továbbá a vitamin- és ásványianyagkiegészítő használat spektrumának szélességével¹⁰. A különbségek mögött elsőként a kínálati környezet szerkezete jelenik meg. A városi terekben jóval szélesebb a termékpaletta, ami nem csak többféle készítményhez biztosít hozzáférést, hanem több termék kombinált használatát is megkönnyíti, ezzel szemben a kisebb településeken a beszerzés gyakran online rendeléshez, vagy utazáshoz kötött, ami a használatot az alapvető készítményekre szűkítheti. Ehhez társul az információs és szakmai közeg különbsége.

Az eltérő minták a városi terekben a kiegészítők funkcionális szétbontásához is vezethetnek (külön termék immunerősítésre, alvásra, ízületi védelemre, regenerációra, fiatalításra), ami a szedett készítmények számát növeli. A kisebb településeken ugyanakkor gyakrabban az általános megközelítés. Részben, mert kevesebb a személyre szabott iránymutatás, illetve a komplexebb rendszerek fenntartása több szervezést igényel. Itt szükséges megemlíteni a költség- és kockázatszelés. Többféle készítmény párhuzamos használata nem csak drágább, hanem nagyobb figyelmet is igényel (adagolás, hatóanyagkölsönhatások). Ahol ezek a kompetenciák korlátozottabbak ott a fogyasztás néhány biztos termékre szűkül.

3. táblázat: Az egészségmagatartás változóinak legkedvezőbb kategóriájába tartozó válaszok aránya településtípusonként

Table 3. Proportion of Responses in the Most Favorable Category of Health Behaviour Variables by Settlement Type

Egészségmagatartási változók	Szignifikáns összefüggés	Község	Város	Főváros
Edzésgyakorlás	+	66%	89%	88%
Az alvás időtartama és minősége	-	91%	80%	88%
Konzultáció sportszakemberrel	-	50%	51%	61%
Egészségügyi szűrővizsgálatok gyakorisága	+	66%	63%	88%
„Csaló étkezések” gyakorisága	+	16%	30%	47%
Élvezeti érték miatt választott, egészségtelen ételek fogyasztása	-	33%	44%	45%
Alkoholfogyasztás gyakorisága	-	83%	88%	88%
Egészségtelen teljesítményfokozó készítmények használata	-	29%	37%	35%
Édesítőszer fogyasztása	-	8%	20%	26%
Diéta követése	+	50%	47%	69%
Étrend-kiegészítők használata	-	58%	78%	78%
Az étrend-kiegészítők használatának gyakorisága	-	58%	70%	76%
Vitaminok és ásványi anyagok használata	+	62%	70%	78%
A vitamin- és ásványianyag-bevitel komplexitása	+	37%	55%	73%

¹⁰ Pearson-féle Khi-négyzet: 11,938, df: 4, p=0,018

Antropometriai jellemzők

A településtípus és az antropometriai jellemzők között (jelenlegi¹¹ és valaha mért legmagasabb¹² testtömegindex, testkép¹³) a statisztikai számítás nem mutatott szignifikáns kapcsolatot. Ez arra utal, hogy ezek a mutatók kevésbé kötődnek a klasszikus településhierarchiához, mint más egészségmagatartási dimenziókhoz. A testkép alakulását és a testsúlyhoz kapcsolódó mutatókat erősen befolyásolják olyan tértől kevésbé függő tényezők, mint a globális médiatartalmak, a közösségi platformok és az egységesülő szépség- és testideálok. Ezek a hatások ma már a falusi és városi populációkban egyaránt jelen vannak, csökkentve a lakóhely szerinti különbségek kialakulásának esélyét.

A testtömegindex esetében további magyarázat lehet, hogy az energia-egyensúlyt meghatározó tényezők (táplálkozás, fizikai aktivitás, életkor, genetikai háttér) a célcsoport specifikus jellege miatt (különösen a viszonylag homogén, fitneszterembe járó mintában) nem mutatnak egyértelmű, településtípushoz köthető mintázatot. Feltételezhető, hogy ez esetben a mintavétel maga is kiegyenlíti a különbségeket, hiszen a vizsgálatba azok kerültek be, akik eleve nagyobb figyelmet fordítanak a testükre. Az igazsághoz hozzá tartozik, hogy a testtömegindex (BMI) nem kellően szenzitív indikátor, amely nem tesz különbséget az izomtömeg és a zsírtömeg között (Rothman, 2008), ebből adódóan a sportoló populációban korlátozott a differenciáló képessége.

A testkép alakulásában ugyanakkor meghatározó szerepet játszanak pszichológiai és életúttal összefüggő tényezők is (önértékelés, korábbi testsúlyváltozások, sportolási motivációk). Ezek a tényezők egyénenként erősen eltérnek, és gyakran felülírják a markosintű területi hatásokat. A logikai kapcsolat tehát kevésbé a térbeli struktúrákon, sokkal inkább az individualizált életmódon és a globálisan egységesülő kulturális mintákon értelmezhető.

4. táblázat: Az antropometriai változók legkedvezőbb kategóriájába tartozó válaszainak aránya településtípusonként

Table 4. Proportion of Responses in the Most Favorable Category of Anthropometric Variables by Settlement Type

Antropometriai változók	Szignifikáns összefüggés	Község	Város	Főváros
BSQ_34	-	50%	51%	52%
Jelenlegi BMI	-	70%	86%	85%
Valaha mért legmagasabb BMI	-	70%	62%	52%

KÖVETKEZTETÉSEK

A vizsgálat legfontosabb eredménye, hogy a fitneszterembe járó, alapvetően aktív és feltételezetten egészségtudatos populáción belül is kimutathatók a településtípushoz köthető különbségek, azonban ezek nem minden dimenzióban jelennek meg azonos erősséggel. Az egészségtudatossághoz kapcsos-

¹¹ F-próba értéke: 0,575, df: 2, p=0,564

¹² F-próba értéke: 0,433, df: 2, p=0,649

¹⁰ Pearson-féle Khi-négyzet: 19,832, df: 16, p=0,228

lódó attitűdök szintjén a térbeli különbségek viszonylag korlátozottan érvényesülnek: mindössze az egészségtudatos életmód fontosságának megítélésében mutatkozott szignifikáns eltérés. Ez arra utal, hogy az alapvető értékek és attitűdök részben homogenizálódnak ebben a speciális mintában, ugyanakkor a lakóhely által közvetített társadalmi–gazdasági és infrastrukturális feltételek még ebben az esetben is befolyásolják az egészséghez való viszonyulást.

Ezzel szemben az egészségmagatartás komplexebb, konkrét viselkedésekben megnyilvánuló dimenziói már markánsabb térbeli differenciáltságot mutatnak. A preventív egészségmagatartás (különösen a szűrővizsgálatokon való részvétel) erőteljesen a nagyvárosi, fővárosi térhez kötődik, ami egyértelműen visszavezethető a kedvezőbb társadalmi státuszra, az egészségügyi szolgáltatások jobb hozzáférhetőségére és az erősebb prevenciók kultúrára. Hasonló logika mentén az edzésgyakorlás is szignifikánsan összefügg a településtípussal, ahol a városi infrastruktúra, a szolgáltatási kínálat és az időbeli rugalmasság támogatja a rendszeresebb aktivitást. A kisebb települések esetében ezzel szemben a strukturális korlátok (utazási idő, korlátozott kínálat) csökkentik a formalizált edzés rendszerességét, még akkor is, ha az általános fizikai aktivitás nem feltétlenül alacsonyabb.

A táplálkozási magatartás és a kiegészítőhasználat területén szintén kirajzolódik a térbeli különbségek komplex rendszere. A városi környezet egyrészt növeli az étrendi kilengések (pl. „csalónapok”) gyakoriságát a szélesebb kínálat és az intenzívebb ingerkörnyezet miatt, másrészt ugyanitt jelenik meg erőteljesebben a tudatos diétakövetés és annak szakmai támogatottsága is. A vitamin- és ásványi anyag-kiegészítők használata nemcsak gyakoribb, hanem diverzifikáltabb is a városi térben, ami az információs és piaci környezet fejlettségével, valamint a magasabb egészségműveltséggel magyarázható. Ezzel szemben a kisebb települések mintázata inkább az alapvető, általános egészségmegőrzésre korlátozódik, amelyben a költségek, a hozzáférés és az információhiány egyaránt szerepet játszik. Összességében ezek az eredmények azt jelzik, hogy míg az attitűdök szintjén részleges kiegyenlítődés figyelhető meg, addig a tényleges viselkedések továbbra is erősen strukturáltak térben.

Az antropometriai mutatók és a testkép esetében nem volt kimutatható szignifikáns kapcsolat a településtípussal, ami fontos kiegészítő következtetés. Ez arra utal, hogy a testtel kapcsolatos objektív és szubjektív jellemzők kevésbé kötődnek a lokális térbeli struktúrákhoz, és sokkal inkább globális, kulturális és egyéni tényezők alakítják őket. A fitneszterembe járó minta homogenizáló hatása, valamint a testideálok médian keresztül egységesülése csökkenti a térbeli különbségek megjelenésének valószínűségét ezen a területen.

A kutatás egyik legfontosabb általános következtetése tehát az, hogy a rendszeres fizikai aktivitás önmagában nem szünteti meg a térbeli egyenlőtlenségeket az egészségmagatartásban. Bár bizonyos dimenziókban (pl. testkép, alapattitűdök) kiegyenlítő hatás érvényesül, a mindennapi egészségmegőrző gyakorlatok továbbra is erősen függnak a lakóhely által meghatározott lehetőségektől és korlátoktól. A településtípus így közvetett módon, az erőforrásokhoz való hozzáféréseken, az infrastruktúrán és az információs környezeten keresztül strukturálja az egészségmagatartást.

Az eredmények gyakorlati hasznosíthatósága több szinten is megjelenik. Egyrészt alátámasztják a területileg differenciált egészségfejlesztési beavatkozások szükségességét: a kisebb településeken különösen fontos a prevenciók szolgáltatások elérhetőségének javítása, a mobil szűrőprogramok bővítése, valamint a helyi sportinfrastruktúra fejlesztése. Másrészt indokolt az egészségműveltség

erősítése és a célzott kommunikáció, különösen a táplálkozás és a kiegészítőhasználat területén. Harmadrészt a városi térben a túlzott fogyasztás és a fragmentált egészségmegőrzési gyakorlatok (pl. túlzott kiegészítőhasználat) tudatosabb szabályozása és szakmai keretek közé terelése lehet releváns.

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Similarities and Differences Between the Contemporary Stipendium Hungaricum Programme and International Student Mobility in Hungary During the Socialist Era

ABSTRACT

This study provides a comprehensive comparative quantitative and policy analysis of inbound international student mobility in Hungary, tracing historical trends from the socialist era (1960–1990) to contemporary developments in the 2024/2025 and 2025/2026 academic years. The results indicate a profound expansion and geographic realignment: the number of international students doubled from 23,000 in 2013 to 49,000 by 2025, while the primary sending region shifted from Europe (72% in 2010) to Asia (46% by 2025). The study concludes that, although both the socialist-era framework and the modern Stipendium Hungaricum (SH) programme rely on state-driven bilateral cooperation, their institutional impacts differ significantly. Student mobility during the socialist era remained a localized foreign policy instrument with minimal structural impact, characterized by Hungarian-language instruction and strict return policies. In contrast, the SH programme serves both foreign policy and higher education development objectives, driving systemic internationalization, the expansion of foreign-language (predominantly English) curricula, and integration into global labour markets. By providing a long-term longitudinal overview extending to 2026, this study contributes to the literature by contextualizing modern state-funded mobility programmes within broader geopolitical shifts and institutional transformations in Central European higher education.

Keywords: higher education, Hungary, international students, Stipendium Hungaricum, student mobility

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INTRODUCTION

International student mobility in higher education, particularly in Hungary, is currently a highly topical and, at times, contentious issue that is frequently the subject of political debate. This is exemplified by the exclusion of two-thirds of Hungarian students from the Erasmus+ programme and by the rapid increase in the number of international students in the Netherlands following Brexit, which sparked public debate over reducing the number of English-taught programmes and, consequently, limiting the influx of international students. Student mobility can and should be examined from numerous perspectives, depending on whether the focus is on outbound or inbound mobility, short- or long-term mobility, the motivations and objectives underlying mobility, or its impact on individuals (including their competences, skills, and career trajectories), higher education institutions, student communities, academic staff, and institutional processes. Furthermore, it encompasses bilateral state cooperation, soft power and public diplomacy, the perceived or actual objectives of both sending and receiving countries, and the subsequent effects on their respective labour markets.

The dynamic growth in the number of international students has led to a substantial increase in the volume of literature on international student mobility (Brooks & Waters, 2013; Findlay et al., 2012; Gürüz, 2008; Kehm & Teichler, 2007; Solimano, 2008; in Hungary: Berács et al., 2009; Rédei, 2007). Some studies approach mobility from the perspective of individual decision-making and the factors influencing these decisions (Dreher & Poutvaara, 2011), while others analyse student mobility from the perspectives of gender (Kofman et al., 2001; Moskal, 2016), economic factors (Beine et al., 2017; Krieger & Lange, 2010), or cultural and social dimensions (King & Raghuram, 2013; Beech, 2015). Another strand of research focuses on globalisation and internationalisation (Teichler, 2004). These studies examine, amongst other issues, the increasingly intense competition for cultural capital (Murphy-Lejeune, 2003; Waters, 2006), the effects of branding strategies adopted by universities and host countries (Joseph et al., 2012; Lomer et al., 2018), and the role of university rankings (Jöns & Hoyler, 2013), whilst also presenting critical perspectives on the neoliberal corporatisation of universities (Castree & Sparke, 2000).

Another important area of research examines the impact of international students on the host country's economy (Alpek et al., 2022; Alpek et al., 2025). This is complemented by analyses of geopolitical influences (M. Császár et al., 2023). Over the past decade, there has been a significant increase in the number of academic studies examining inbound student mobility in Hungary, largely driven by the growing emphasis placed on mobility within various funding programmes (TÁMOP, EFOP, Stipendium Hungaricum). The Tempus Public Foundation publishes annual statistics and reports on the programmes it administers. Beyond statistical analyses, recent studies on the subject (M. Császár et al., 2021) examine the distribution of international students by field of study, level of study, higher education institution, and geographical origin.

Despite the growing body of literature on international student mobility, comparatively little attention has been paid to the historical transformation of inbound student mobility in Hungary, particularly to the relationship between the socialist-era model of international student recruitment and the contemporary system shaped by globalisation and state-supported scholarship schemes. Therefore,

this study examines the origins of inbound mobility in Hungarian higher education, focusing on the so-called socialist model that emerged during the 1950s and 1960s, as well as the restructuring of international student flows following Hungary's global opening in the 2010s. Particular attention is paid to the Stipendium Hungaricum scholarship programme during the two most recent academic years in order to highlight the principal similarities and differences between these two historical periods.

METHODS

This study provides a comparative quantitative overview of inbound international student mobility to Hungary. It contrasts historical trends from the 1960–1990 period with contemporary developments in the 2024/2025 and 2025/2026 academic years, while also tracing the evolution of the Stipendium Hungaricum scholarship programme since its inception in 2013. Drawing on the FIR-OSAP database and the relevant *Statistical Yearbooks*, the paper analyses the distribution of international students by country of origin, continent, level of study, and higher education institution. Furthermore, it provides a detailed analysis of Stipendium Hungaricum (SH) scholarship recipients, focusing on data from the 2024/2025 and 2025/2026 academic years.

RESULTS

The Internationalisation of Hungarian Higher Education During the Socialist Era

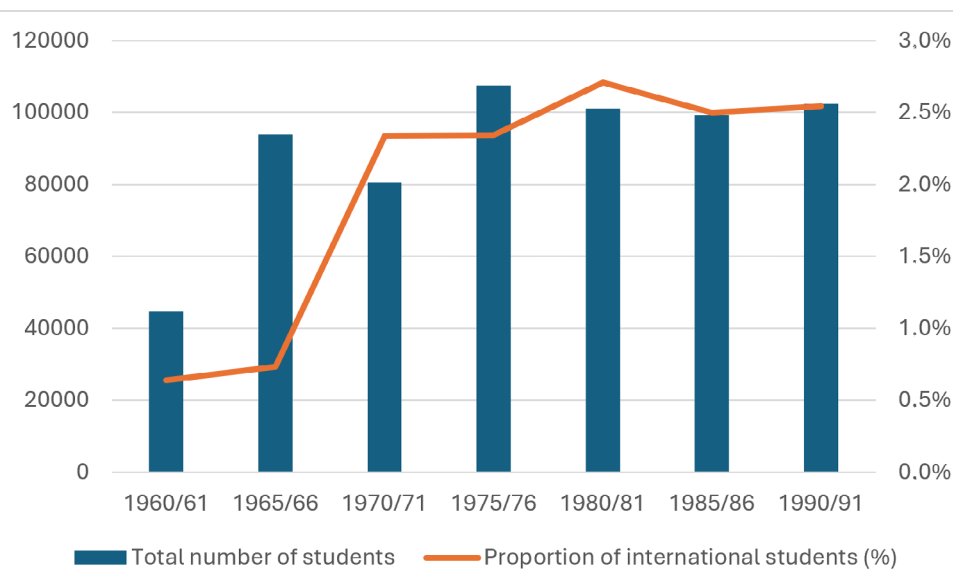
Although Hungarian higher education has a history spanning more than six and a half centuries, beginning with the university founded in Pécs by King Louis I (Lajos I), it was the major universities established during the final decades of the nineteenth century that formed the country's first robust higher education network. Much of this network, however, found itself outside Hungary's borders following the First World War. Consequently, one of the principal objectives of post-Trianon policy was to strengthen the country in the cultural sphere (Dányi, 2000). Following the First World War, the relocation of universities from the lost territories to the new national borders laid the foundations for several university centres that continue to operate today (Jávorffy-Lázok & Tésits, 2020). From the 1920s onwards, Hungary, situated within the ring of the Little Entente, became increasingly isolated in terms of foreign policy. Efforts to overcome this isolation focused partly on promoting Hungarian culture abroad and partly on ensuring that Hungarian scholarship recipients pursued their studies abroad within an organised and supervised framework. The establishment and re-establishment of the Rome- and Vienna-based *Collegium Hungaricum* institutions also served this purpose. Ultimately, Hungarian cultural policy did not prioritise the introduction of international cultural values into the country; consequently, the number of foreign students studying in Hungary remained relatively low, even in comparison with the domestic student population, which itself was modest by today's standards. Following the First World War, the student population numbered approximately 14,000,

but it gradually declined over the following decades. By the 1937/38 academic year, immediately before the outbreak of the Second World War, only 13,000 students were enrolled in Hungarian higher education institutions (Romsics, 2017).

The Hungarian education system underwent another profound transformation following the Second World War. Alongside the establishment of a new public education system, higher education also experienced a comprehensive ideological and structural reorganisation (Dányi, 2000). From the late 1940s onwards, as communist Hungary became almost entirely detached from the Western world, its international relations were largely confined to the socialist bloc and countries maintaining friendly relations with it. This orientation was reflected throughout the academic sector, including the international networks of higher education institutions (Dányi, 2000). The forced restructuring of higher education, like that of the economy and several other social subsystems, was implemented through centrally planned quotas. For example, the Five-Year Plan for 1950–1954 specified the number of students to be admitted to higher education. According to the plan, the student population of just over 23,000 was to be doubled gradually, albeit at a rapid pace, by the end of the planning period. The target for 1952 alone was already 45,000 students, and by September 1952 nearly 46,000 students had been admitted to Hungarian colleges and universities (Keresztes, 2020). This rapid expansion began to slow following the consolidation of the Kádár regime in the early 1960s, and the overall number of students in Hungarian higher education remained largely unchanged until the collapse of the socialist system. Apart from minor fluctuations, enrolment remained at approximately 100,000 students for several decades. It was only after the political transition that Hungarian higher education once again opened to much broader segments of society. Throughout the socialist period, Hungarian higher education functioned as a relatively closed and elitist system.

The internationalisation of Hungarian higher education began in parallel with the stabilisation of the Kádár regime. During the subsequent period of political stability, particularly from the 1970s onwards, Hungary's foreign policy priorities became increasingly evident in the changing geographical composition of the international student population. In many cases, fluctuations in the number of students arriving from particular friendly countries reflected developments in Hungary's international relations. The number of international students increased exponentially over an extended period. Beginning in the early years of the Kádár era, international student enrolment experienced sustained and substantial growth for approximately fifteen years. Hungary's growing engagement in Africa and Asia also created new opportunities for higher education, as student exchange programmes enabled the education of specialists and future leaders from countries with limited or non-existent higher education systems to take place largely within socialist countries, including Hungary. At the same time, Hungarian academics and researchers gained opportunities to become familiar with partner countries and to contribute to their reconstruction (Horváth, 2023). This remarkable momentum began to weaken only during the second half of the 1970s. Following the turn of the decade, the long-standing upward trend reversed for the first time during the Kádár era, and the overall number of international students began to decline. Nevertheless, the proportion of international students relative to the total higher education student population remained stable from the 1970s until the end of the socialist period, accounting for approximately 2.5–2.7% of all students (Figure 1).

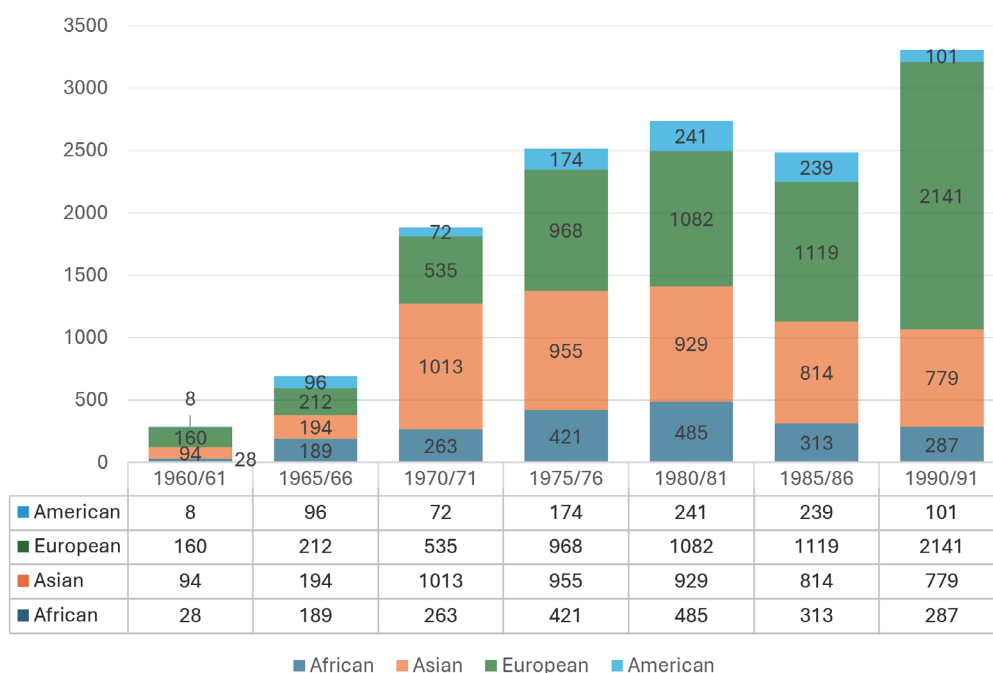
Figure 1. Number of Students Enrolled in Higher Education Institutions in Hungary and the Proportion of International Students, 1960–1990.



Source: Based on Statisztikai Évkönyv (1965, 1970, 1975, 1980, 1985, 1990) and Szemerszki (2005), edited by R. Izmindi.⁵

Whilst the decolonisation movements in Africa and Asia, which had been gaining momentum since the 1950s, contributed to the increase in the number of international students during the 1960s and 1970s, the introduction of German- and subsequently English-language medical programmes (primarily targeting European students) responded to market demand. In the 1990s, ethnic Hungarians from neighbouring countries also began to appear in Hungarian higher education.

Figure 2. Number of International Students in Hungary by Continent of Origin, 1960–1990.

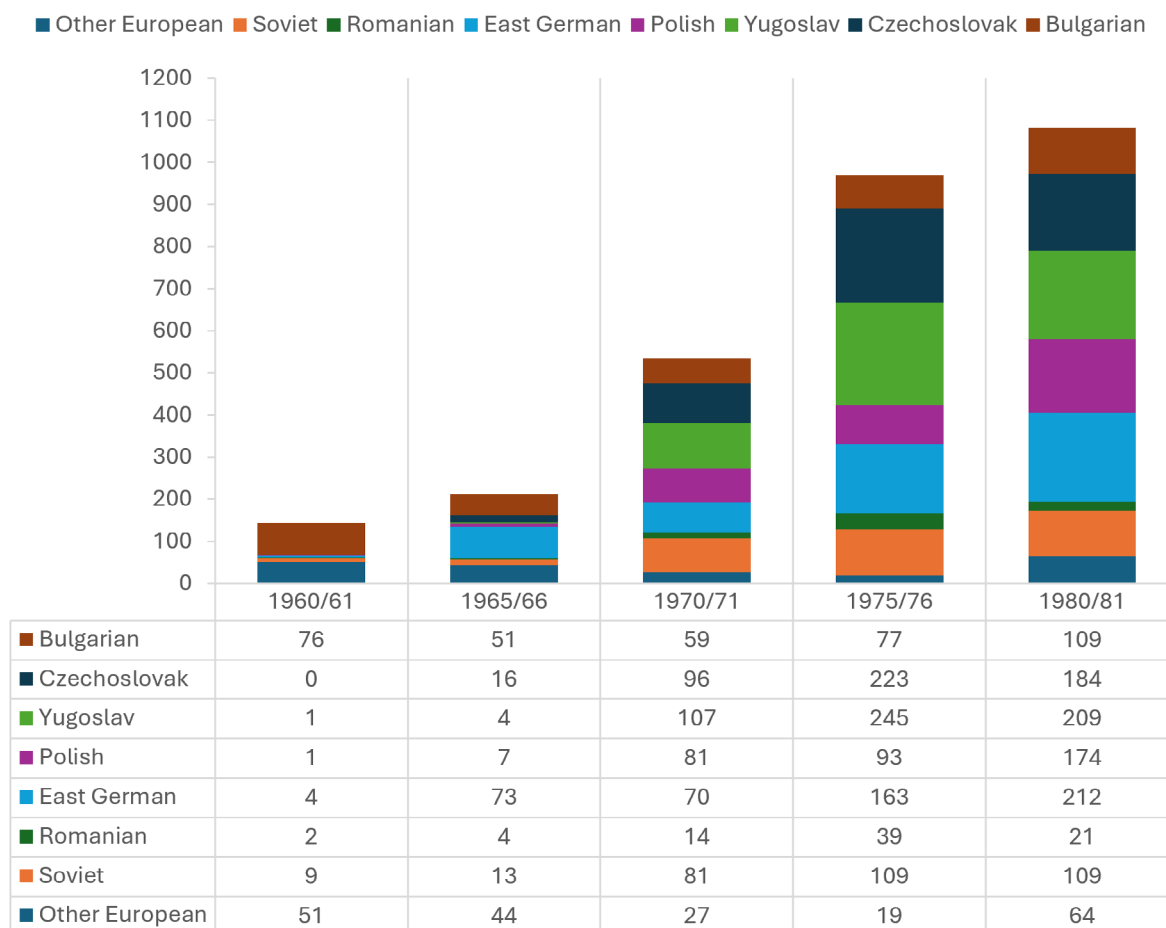


Source: Based on Statistical Yearbooks and Szemerszki (2005); compiled by R. Izmindi.

⁵ Based on data from Statisztikai Évkönyve (1965, 1970, 1975, 1980, 1985, 1990) and (Szemerszki 2005).

Between 1965 and 1980, the number of students arriving from European socialist „friendly” countries increased steadily, although at varying rates. Significant differences can also be observed when comparing the continental origins of incoming students. Although the scale of growth differed, similar trends characterised students arriving from Africa and the Americas. Whilst the number of students from these two continents increased by approximately two and a half times over the fifteen-year period (1965–1980), the number of European students grew at roughly twice that rate, increasing fivefold overall. Only students arriving from Asia followed a different pattern. After a period of rapid growth during the second half of the 1960s, their numbers began to decline slightly from the 1970s onwards, followed by a more pronounced decrease. These developments may have been closely related to the geopolitical situation in Southeast Asia, including the outbreak and escalation of the Vietnam War and the subsequent establishment of a unified socialist Vietnam, which reshaped the regional balance of power (Figure 2).

Figure 3. Total Number of International Students from Europe Studying at Higher Education Institutions in Hungary, by Major Country of Origin, 1960–1980.



Source: Based on Statistical Yearbooks and Szemerszki (2005); compiled by R. Izmind.

Although the number of students arriving from Europe grew more rapidly than those from other continents during the Kádár era, notable differences emerge when individual countries are examined. As expected, the majority of students came from Eastern Europe, particularly from the countries of the socialist bloc. However, considerable variation existed within this group from the 1960s onwards

(Figure 3). At the beginning of the Kádár era, Bulgarian students constituted the largest share of European students studying in Hungary. Overall, fewer students arrived from the rest of the Balkans, and neither Romania nor Yugoslavia sent substantial numbers of university students. During the 1950s, the notoriously poor political relations between Hungary and Yugoslavia appear to have had a lasting negative effect on cultural and higher education cooperation. However, the number of Yugoslav students increased dramatically around the turn of the 1960s and 1970s. In other words, following the easing of political tensions between the two countries, students from Yugoslavia increasingly took advantage of the opportunity to pursue higher education in Hungary.

It is noteworthy that Romania, which had a population of approximately 21 million at the time, including an estimated 1.5 million ethnic Hungarians, sent remarkably few students to Hungary throughout the entire socialist period. When neighbouring countries with sizeable Hungarian minority populations are considered together, it becomes evident that the number of students arriving from these communities remained relatively modest. Although Hungarian served as the language of instruction for international students, ethnic Hungarians from the Carpathian Basin were largely unable to benefit from this opportunity. Thus, Soviet-era foreign policy in the region, which largely disregarded minority issues, also influenced patterns of higher education mobility. Although the Soviet Union was by far the largest and most politically influential member of the socialist bloc, the number of students arriving from the Soviet republics remained low relative to its population, amounting to only around one hundred even during the 1970s.

Growing interest in Hungarian universities was particularly evident in two countries: Poland and the German Democratic Republic (GDR). Whereas fewer than ten Polish students were enrolled in the mid-1960s, more than eighty had arrived only five years later, and by the early 1980s their number had more than doubled. The largest number of international students came from the GDR, despite its population being only around one and a half times that of Hungary. Moreover, this trend continued uninterrupted for more than two decades, with the number of GDR students reaching approximately two hundred by the 1980s. This coincided with the period during which relations between the two German states improved as a result of the Federal Republic of Germany's *Ostpolitik*, while Hungarian–West German relations also strengthened considerably. A turning point came during the political transition of the early 1990s, when the number of non-Hungarian citizens enrolled in higher education increased sharply. At the same time, German-language medical education had already been introduced at SOTE (Semmelweis University of Medicine) in the early 1980s, followed by the launch of English-language medical programmes at Semmelweis, Pécs, Szeged, and Debrecen by the end of the decade.

Current Mobility Trends in Hungary

Growth in the Number of International Students

From the 1990s until the 2010s, international students in Hungary primarily belonged to two groups: ethnic Hungarians from neighbouring countries studying in Hungarian and medical students enrolled in English- or German-language programmes (mainly from Europe, but also in significant numbers

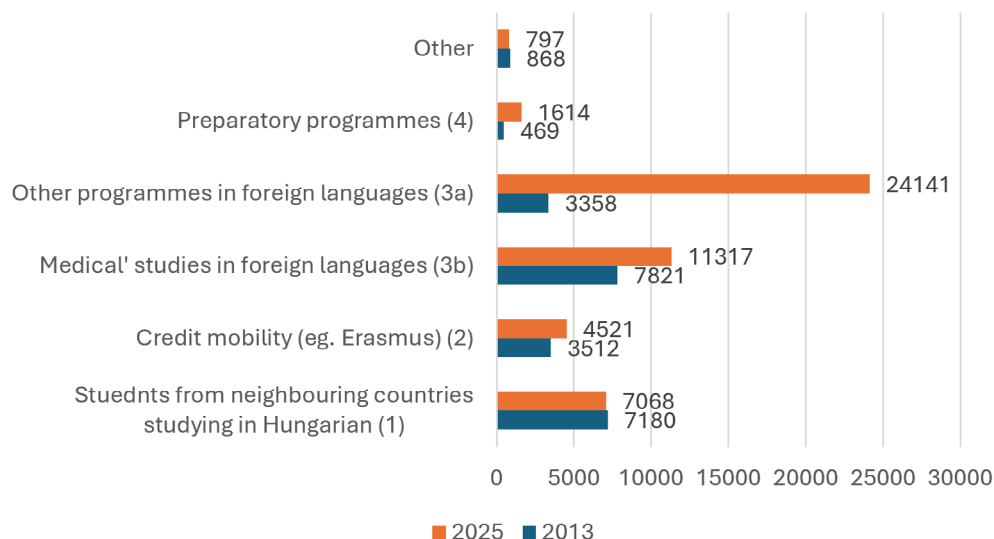
from Iran and Israel). Following Hungary's accession to the European Union, these groups were joined by students participating in the predecessor programmes of Erasmus+ (Socrates, LLP-Erasmus, Erasmus Mundus, Tempus I–IV), as well as numerous other scholarship and mobility schemes. Neither ethnic Hungarian students from neighbouring countries nor students enrolled in foreign-language medical programmes brought about comprehensive structural change within Hungarian higher education, although the latter generated substantial revenue and introduced transferable good practices at certain universities. Ethnic Hungarian students from neighbouring countries largely integrated into the Hungarian higher education system, whereas English- and German-language medical programmes remained clearly separated from Hungarian-language education. Consequently, there was little interaction between these student populations, and—with a few notable exceptions—the good practices developed within these programmes rarely spread to other faculties or disciplines. As a result, in most academic fields, the development of foreign-language programmes and related institutional services has been closely linked to European funding. Whereas in 2000 only a few dozen international students participated in Erasmus mobility, by 2015 more than 4,000 Erasmus students were studying in Hungary, and by 2019 their number had reached a peak of almost 5,000. Nevertheless, these short-term mobility programmes did not produce systemic institutional change. Instead, developments remained largely isolated within individual universities or faculties and only rarely formed part of a coherent institutional strategy.

Up to 2013, international students in Hungarian higher education can therefore be divided into three main groups: (1) ethnic Hungarian students from neighbouring countries studying in Hungarian; (2) international students participating in short-term credit mobility through scholarship programmes (predominantly Erasmus); and (3) degree-seeking international students enrolled in full-time foreign-language programmes. The latter category can be further divided into (3a) self-funded students who finance their own studies, predominantly in English-language programmes, and (3b) students enrolled in medicine, dentistry, pharmacy, and veterinary medicine, disciplines that have attracted international students for several decades. The proportion of international students enrolled in foreign-language medical programmes is exceptionally high, exceeding 70% (Figure 4).

A comparison of the 2013 and 2025 data clearly demonstrates that, over the course of just over a decade, not only has the number of international students more than doubled—from 23,000 to 49,000—but the composition of the international student population has also changed substantially. Although the number of ethnic Hungarian students arriving from neighbouring countries to study in Hungarian has remained relatively stable (7,180–7,068), their share of the international student population has declined from 31% to 14%. This stagnation is likely attributable both to the declining number of ethnic Hungarians living abroad and to the strengthening of Hungarian-language higher education institutions in neighbouring countries. Although the number of students participating in short-term mobility programmes (predominantly Erasmus) has increased (3,500–4,500), their proportion has fallen from 15% to 9%, as the expansion of this group has not kept pace with the growth in full-degree international students. The latter group increased from 11,000 to 35,000 students, representing more than a threefold increase, while its share rose from 48% to 72%. Within this category, alongside an almost 50% increase in the long-established medical sub-group (medicine, dentistry, pharmacy, and

veterinary medicine), undergraduate, master's, and doctoral programmes in other academic fields experienced a tenfold increase in enrolment.

Figure 4. Student Groups Within the International Student Population in Hungarian Higher Education, 2013 and 2025.



Source: OH FIR 2013/14 Fall; OH FIR 2025/26 Fall. Edited by G. Dobos.

The growth in the number of international students has coincided with a decline in the number of Hungarian students enrolled in higher education over the past decade (M. Császár et al., 2021). As a result, the proportion of international students increased from 3.4% in 2001 to a peak of 14.4% in 2022 and has stabilised at around 14% over the past three years. At the national level, this already represents a substantial presence within Hungarian higher education. At several institutions—including the University of Veterinary Medicine, Semmelweis University (49–37%), Corvinus University of Budapest (24%), the Liszt Ferenc Academy of Music, the University of Pécs, and the University of Debrecen (22%)—international students account for more than 20–25% of total enrolment, indicating significant structural and institutional transformation. The rapid growth in the number of international students has been driven primarily by the Stipendium Hungaricum scholarship programme, established in 2013 (Figure 5).

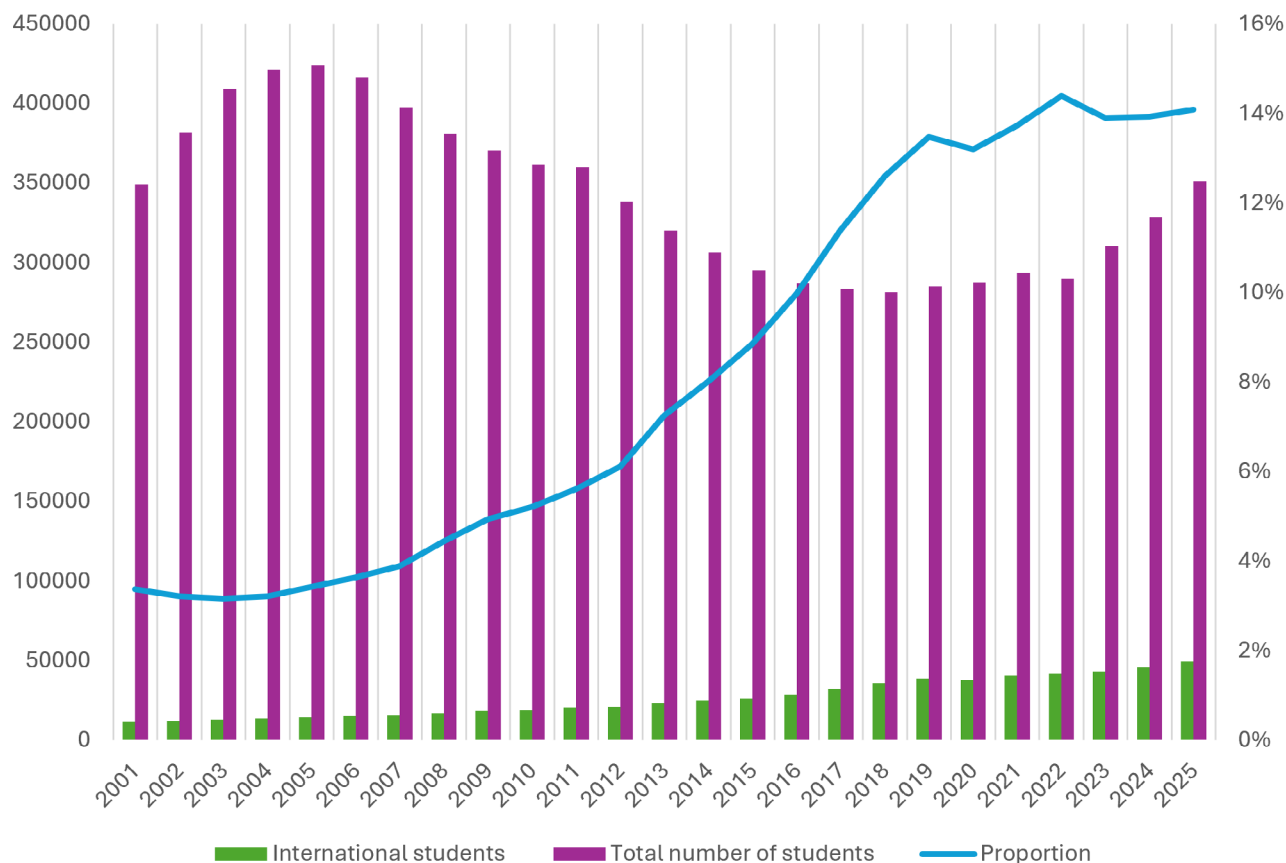
Where Do International Students Come From?

The international recruitment base of Hungarian higher education has expanded considerably over the past decade and a half. This expansion is reflected not only in the growing number of international students but also in the changing continental composition of the incoming student population (Figure 6).

The data clearly show that, in 2013, Hungarian higher education remained predominantly Europe-oriented, whereas by 2025 Asia had become the largest source region, accounting for 46% of all international students, while the share of European students had fallen to 36% (compared with 72% in 2010). The number of African students increased almost fourteenfold compared with 2010. Whereas students from approximately 150 countries and political entities were enrolled in Hungarian

higher education during the 2013/2014 academic year, by 2025/2026 Hungarian universities welcomed students from around 180 countries and territories worldwide.

Figure 5. Total Number and Proportion of Domestic and International Students in Hungarian Higher Education, 2001–2025.



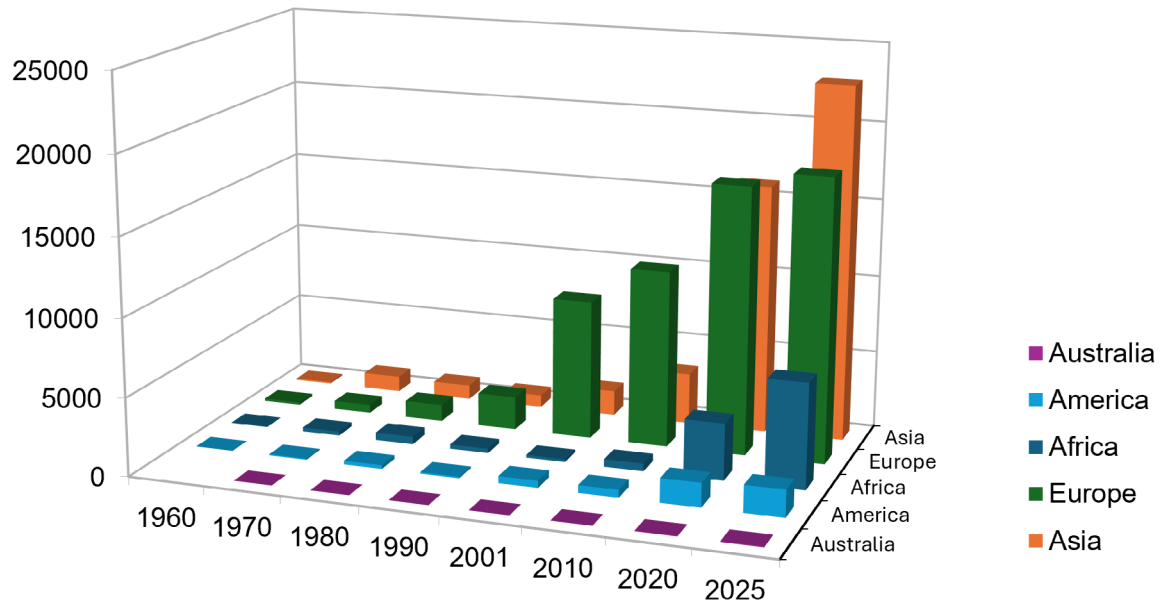
Source: OH FIR; compiled by G. Dobos.

Several patterns can be identified in the distribution of international students by country of origin (Figure 7). First, the number of students is strongly influenced by the population size of the sending country. Countries with populations of around or more than 100 million inhabitants naturally tend to send larger numbers of students, as is the case globally. However, this relationship is not universal. Even when considering only countries sending at least 500 students, several exceptions emerge. It is evident that the principal sending countries are concentrated in Eurasia. None of the highly populated countries in the Americas (such as Brazil or Mexico) belong to this group, and, with the exception of several African countries (including Egypt, Nigeria, Kenya, and Tunisia),

African countries generally contribute relatively smaller numbers of students. The leading sending countries include both highly developed economies (Germany, France, Japan, and South Korea) and developing or emerging economies (Pakistan, India, Nigeria, China, Iran, and Jordan). This pattern is consistent with broader international trends. On the one hand, developed economies increasingly utilise more cost-effective forms of international knowledge acquisition. On the other hand, developing countries seek to accelerate their socio-economic development by participating in the international higher education market, often because of limited domestic higher education capacity. This pattern—

the movement of students from less developed to more developed higher education systems—is also a well-established feature of global educational migration.

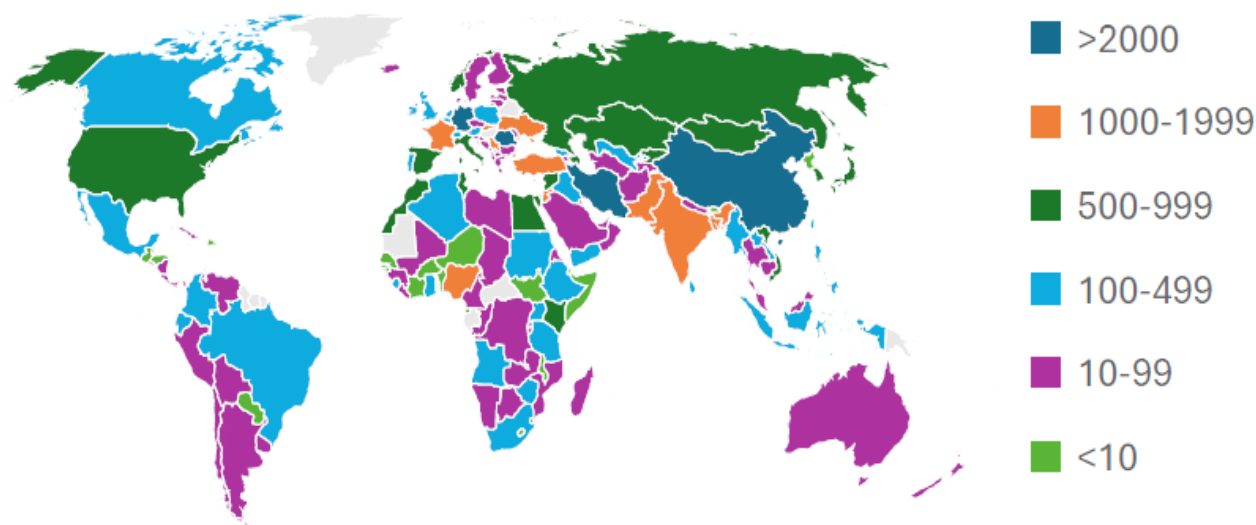
Figure 6. International Students in Hungary by Continent of Origin, 1960–2025.



Source: OH FIR; Statistical Yearbooks; compiled by R. Izmindi and G. Dobos.

Another clearly identifiable geographical characteristic is the strong student mobility originating from Hungary's neighbouring countries. In this case, the Hungarian minority communities of the Carpathian Basin account for several thousand international students. More than 1,000 students arrive from Slovakia (Upper Hungary/Felvidék), Ukraine (Transcarpathia), Romania (Partium and Transylvania), and Serbia (Vojvodina). The data also demonstrate that geographical proximity generally plays an important role in students' choice of destination country. Of the 14 countries represented by at least 1,000 students, nine are located in Europe or the Middle East; only China, India, Pakistan, Bangladesh, and Nigeria are situated outside this broader region (Figure 7).

Figure 7. Categories of International Student Numbers in Hungarian Higher Education by Sending Country, Academic Year 2025/26 (Fall).



Source: OH FIR, 2025. Edited by G. Dobos.

A comparison of the ten largest sending countries with the corresponding data for the 2013/2014 academic year (Table 1) reveals several noteworthy changes. Over the past decade, the geographical composition of the largest sending countries has undergone a substantial transformation. China, Bangladesh, India, and Pakistan have joined the leading source countries, while, somewhat unexpectedly, France and Spain have also emerged as major sending countries, despite the reputational challenges faced by Hungarian higher education following the exclusion of universities operated by public interest asset management foundations (KEKVA) from the Erasmus+ programme in 2022.

Table 1. The Largest Sending Countries in Hungarian Higher Education, 2013 and 2025.

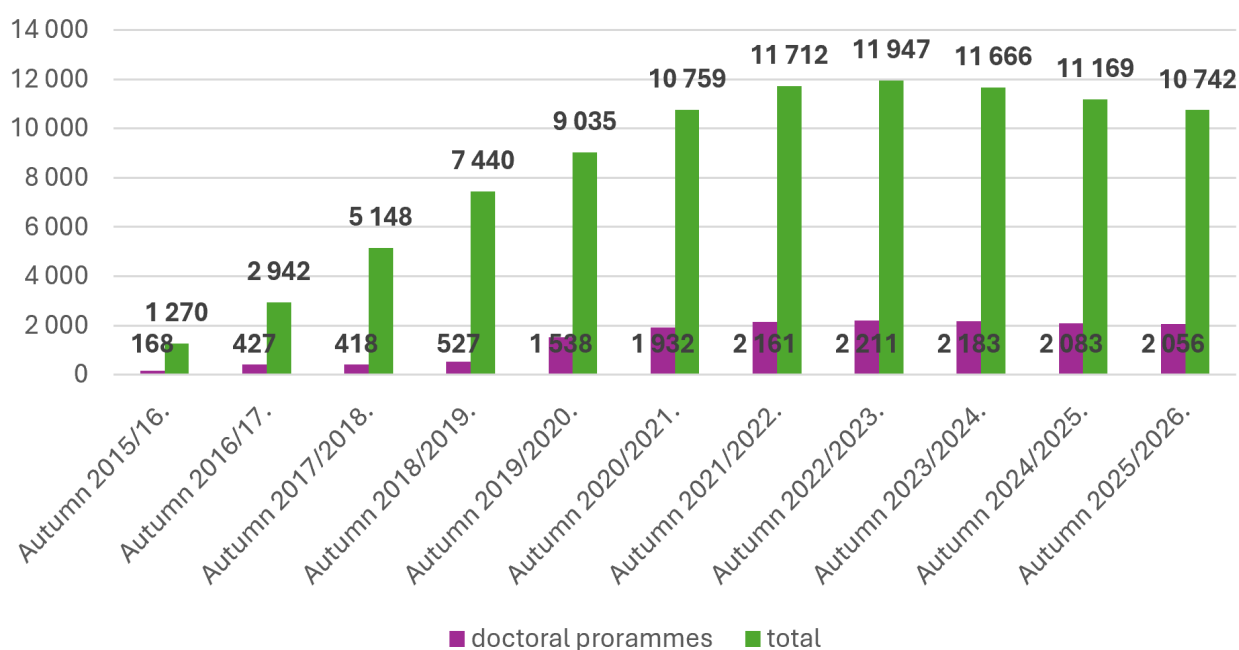
Rank	Country 2013	2013, number of international students	Country 2025	2025, number of international students2	Previous rank
1	Germany	2851	Germany	3460	
2	Slovakia	2330	China	3126	15
3	Romania	2253	Romania	3083	
4	Serbia	1543	Turkey	1994	
5	Ukraine	1169	Slovakia	1874	
6	Iran	988	India	1554	40
7	Norway	859	Pakistan	1548	41
8	Nigeria	827	Banglades	1509	84
9	Turkey	768	France	1025	11
10	Israel	691	Spain	716	12

Source: OH FIR 2013, 2025. Edited by G Dobos

The Stipendium Hungaricum Programme and Its Characteristics

The Stipendium Hungaricum (SH) programme, launched in 2013, marked a turning point in the internationalisation of Hungarian higher education and in the growth of the international student population. The programme was established by the Hungarian government in 2013. Since 2015, it has been coordinated by the Tempus Public Foundation and overseen by the Minister of Foreign Affairs and Trade (with the exception of the 2015–2019 period, when responsibility for the programme was transferred to the ministry responsible for higher education). The SH programme was created in the spirit of Hungary’s „Opening to the East and South” policy (its original working title was the *Global Opening Scholarship Programme*) and emerged at a time when the global market for international students was becoming increasingly diversified. Over its thirteen years of operation, the programme has expanded bilateral cooperation to include more than one hundred partners (countries, international organisations, and regional or local governments) across much of South America, Africa, and Asia. It has supported nearly 30,000 scholarship recipients, funded the education of approximately 15,000 graduates, and enrolled 10,742 scholarship holders in the 2025/2026 academic year. Among its most significant achievements are the provision of stable funding for foreign-language programmes and related support services (amounting to nearly HUF 300 billion over ten years, roughly equivalent to one full year’s state funding for Hungarian higher education during that period) and the establishment of English-language doctoral programmes. Whereas only 13 doctoral students were studying in a foreign language in 2013, this number had increased to 2,589 ten years later, of whom 2,211 were SH scholarship holders (Figure 8).

Figure 8. Number of SH Scholarship Holders, Including Doctoral Students, by Academic Year, 2015–2025.



Source: TKA (2025); edited by G. Dobos.

Driving Forces

The bilateral character of the programme resembles the student mobility arrangements of the socialist era, which were likewise based on cooperation with „friendly” countries. However, the SH programme differs substantially both in scale and in its impact on Hungarian higher education. In both cases, the underlying driving force was Hungary’s foreign policy. Before 1989, however, Hungary’s internationalisation strategy was not determined independently but was shaped by the foreign policy of the Soviet Union, particularly through educational cooperation with newly independent socialist-oriented states. By contrast, in 2013 Hungary deliberately expanded its relations with countries in the East and South in order to strengthen its foreign policy position. In many cases, the SH programme served as an instrument of soft diplomacy, facilitating the establishment or re-establishment of bilateral relations after extended periods of limited cooperation. According to some assessments, the SH programme has been one of the few consistently successful instruments of Hungary’s „Opening to the East and South” policy.

Policy Context

The most fundamental difference between the socialist intergovernmental scholarship system and the Stipendium Hungaricum programme is that the latter has been conceived not only as a diplomatic instrument but also as an integral component of higher education policy. At its launch, the SH programme drew heavily on the institutional legacy of the socialist model. Between 2013 and 2015, it was administered by the Balassi Institute, the legal successor of the International Preparatory Institute (NEI), which had become one of the key institutions of the socialist scholarship system after its establishment in 1957. Consequently, the initial design of the programme reflected the Balassi Institute’s two principal areas of expertise. As Hungary’s leading institution for teaching Hungarian as a foreign language, it initially focused on preparatory Hungarian-language education, after which scholarship holders continued their studies in Hungarian. At the same time, the experience gained through the intergovernmental scholarship programme administered by the Hungarian Scholarship Committee, which also operated within the Institute, provided an institutional model for the new programme. It soon became apparent, however, that these organisational structures—designed to serve a relatively small number of students—were unable to accommodate the government’s ambitions for the SH programme. Consequently, the programme adopted another existing model that was capable of supporting much larger student numbers within a relatively short period: the English-language preparatory programmes already operating at Hungarian medical universities.

In 2015, the programme underwent a fundamental institutional transformation. Responsibility for its operation was transferred to the Ministry of Human Resources (EMMI), which was responsible for education, and to the Tempus Public Foundation (TKA), Hungary’s principal organisation for the internationalisation of education. Between 2015 and 2019, the programme’s core institutional framework was established in close cooperation with Hungarian higher education institutions. During this period, the higher education policy foundations of the SH programme were laid, the registration of foreign-language degree programmes commenced, and comprehensive quality assurance mechanisms and student support services were introduced. As Hungary’s Erasmus+ National Agency, the Tempus

Public Foundation successfully incorporated broader European approaches to internationalisation into the operation of the programme. This institutional approach remained largely unchanged after responsibility for the programme returned to the Ministry of Foreign Affairs and Trade in 2019.

The Programme's Instruments and Objectives

As demonstrated above, one of the principal differences between the socialist model and the SH programme is that the latter simultaneously pursues foreign policy and higher education policy objectives. At the same time, important similarities and differences can also be identified in the instruments employed by the two systems. As noted earlier, the central institution of the socialist model was the International Preparatory Institute (NEI), where international students completed a one-year Hungarian-language preparatory programme before continuing their studies at Hungarian universities and colleges. Although the Institute is generally regarded as having been established in 1966, several earlier predecessors existed, including the Korean Preparatory School founded in 1952 and the University Preparatory Programme for Foreign Scholarship Students established in 1957, which operated within ELTE as the International Preparatory College between 1964 and 1966 (Maróti, 2017). It was within the NEI that the system of teaching Hungarian as a foreign language—still widely used today—was developed. Under the socialist model, all international students studied in Hungarian. They completed the preparatory year separately and subsequently attended regular university programmes together with Hungarian students. The primary objective of the scholarship scheme was to educate qualified professionals who would subsequently contribute to the development of their home countries. Since no global labour market existed at the time, the possibility of graduates remaining abroad was not regarded as a policy objective. Although some scholarship recipients did remain in Hungary and establish families, such cases were exceptional rather than typical before 1989.

The Stipendium Hungaricum programme, by contrast, was created within the context of a globalised economy, where preparing graduates for the international labour market—or even attracting them to the Hungarian labour market—has become an unavoidable policy consideration, particularly in the context of predominantly English-language higher education. Nevertheless, during its initial phase (2015–2017), the programme did not seek to retain graduates in Hungary. Indeed, scholarship agreements initially included a requirement for recipients to return to their home countries after graduation, although this obligation was not supported by either monitoring mechanisms or sanctions. At the same time, there is a clear need to facilitate the integration of SH graduates—and, more broadly, international graduates of Hungarian higher education—into both the Hungarian and international labour markets. According to the SH graduate tracking survey, 37.3% of graduates worked in Hungary during their studies, while 23.4% planned to work in Hungary but ultimately left the country after graduation. Approximately 25% moved to a third country, whereas the majority returned to their country of origin. Prior to beginning their studies in Hungary, one-third (33.2%) of respondents had intended to remain in Hungary after graduation. During their studies, this proportion increased to 56.4%, and by graduation almost half (49.6%) planned to stay in the country (OH, TKA, 2021). Following the COVID-19 pandemic, the programme and the responsible ministry took only limited initial steps to explore employment opportunities for SH graduates within the Hungarian

labour market, including the implementation of the graduate tracking survey. Nevertheless, in sectors facing persistent labour shortages, as well as in research and higher education, it appears difficult to justify not providing graduates of a publicly funded scholarship programme with opportunities to remain and work in Hungary.

The comparison presented above demonstrates that, although the Stipendium Hungaricum programme builds upon certain institutional and conceptual elements inherited from the socialist scholarship model, its objectives, instruments, and systemic impacts differ fundamentally. The main similarities and differences between the two models are summarised in Table 2.

Table 2. Key Similarities and Differences Between the Socialist Model of International Student Mobility and the Stipendium Hungaricum Programme

Socialist model	Stipendium Hungaricum programme
Bilateral, intergovernmental cooperation	Bilateral, intergovernmental cooperation
Hungarian-language education	Foreign-language education, predominantly in English
Expectation of return to the home country	Integration into a global labour market; potential retention of graduates
Limited institutional impact on Hungarian higher education	Significant systemic impact on higher education internationalisation
Primarily shaped by foreign policy constraints	Expands diplomatic relations and foreign policy opportunities
Central institutionalised framework: International Preparatory Institute (NEI)	Multi-level institutional framework involving TKA, higher education institutions, and the Ministry of Foreign Affairs and Trade
Limited spillover effects beyond scholarship holders	Stimulates the development of foreign-language programmes and attracts self-funded students
Mainly a foreign policy instrument	A combined instrument of foreign policy, soft diplomacy, and higher education development

CONCLUSIONS

Although the socialist model and the Stipendium Hungaricum programme are both based on bilateral intergovernmental cooperation, they differ fundamentally in their objectives, institutional frameworks, and long-term impacts. These differences reflect the distinct historical periods, socio-economic systems, and geopolitical contexts in which the two models emerged. While inbound student mobility during the socialist era primarily functioned as an instrument of foreign policy, with limited consequences for the wider higher education system, the contemporary Stipendium Hungaricum programme operates simultaneously as a foreign policy instrument, a soft diplomatic tool, and a mechanism for higher education development. Consequently, its effects extend far beyond student mobility itself, contributing to institutional internationalisation, the expansion of foreign-language education, and the integration of Hungarian higher education into global knowledge networks.

The development of international student mobility in Hungary over the past five decades has consistently reflected broader changes in the country's foreign policy orientation. During the socialist era, international recruitment was shaped initially by the processes of decolonisation in Africa and Asia and later by cooperation with socialist "friendly" countries, particularly in Europe. In the

1980s, the emergence of German- and English-language medical programmes represented an early transition towards a more market-oriented form of internationalisation, primarily attracting European students. Following the political transition, the role of neighbouring countries and ethnic Hungarian communities became increasingly significant, while European Union mobility programmes gradually supported the expansion of foreign-language education across a wider range of academic fields.

The establishment of the Stipendium Hungaricum programme in 2013 marked a qualitative transformation in this process. Unlike previous forms of international student mobility, which were either limited in scope or concentrated within specific institutional and disciplinary contexts, SH generated systemic changes throughout Hungarian higher education. The programme contributed not only to the substantial growth in the number of international students but also to the development of English-language degree programmes, doctoral education, international student services, and institutional strategies for internationalisation. Furthermore, it broadened Hungary's recruitment base from a predominantly European orientation towards a genuinely global higher education perspective.

At the same time, the long-term success of the programme increasingly depends on how effectively Hungary can utilise the knowledge, skills, and international networks of SH graduates. In a context characterised by demographic challenges, labour shortages, and growing competition for highly skilled professionals, international graduates represent a potential resource for both the Hungarian economy and academic sector. Therefore, the future development of the programme should not only focus on attracting students but also on creating appropriate pathways for graduates who wish to continue their professional careers in Hungary. Overall, the Stipendium Hungaricum programme represents a major turning point in the history of international student mobility in Hungary. While it retains certain characteristics of earlier state-driven scholarship schemes—most notably bilateral governmental cooperation—it has evolved into a substantially different model, combining diplomatic objectives with higher education development and global engagement. The Hungarian case demonstrates how state-supported scholarship programmes can transform from instruments of international relations into drivers of structural change within national higher education systems.

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