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Political economy and everyday practices behind gentrification in working-class urban neighbourhoods

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Abstract

This paper explores the synthesis of political-economy perspectives on uneven development with everyday-focused social-theoretical approaches, specifically examining gentrification through the lens of working-class residents' experiences. The study argues that while uneven development imposes rigid structural constraints, it also serves to differentiate the working class and its internal constituents. The research is situated within the Central and Eastern European context, focusing on two Hungarian case study locations: Nagysándortelep in Debrecen and the Zsolnay district in Pécs. The methodology employs a multi-scalar approach, combining historical analysis with qualitative insights from narrative, semi-structured and focus group interviews. The analysis traces the evolution of both districts from their origins as industrial working-class colonies consolidated during the capitalist processes of the late 19th century through subsequent periods of socialist state-led disinvestment and neoliberal urban strategies of capital reinvestment. By studying the current relationship of workers to slow, sporadic, and spontaneous gentrification within this urban-historical context, mutually reinforcing and undermining moments of structure and everyday practices emerge, exposing the dialectical relationship between the causes and consequences of gentrification. By bridging the gap between structural theories and micro-level agency, the paper contributes to a more nuanced understanding of how the production of space is negotiated and contested within the specific urban trajectories of the CEE region.

Keywords: uneven development, gentrification, political economy, everyday life, CEE, Debrecen, Pécs

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Introduction

The central aim of this paper is to bring an epistemological question to the fore of the debate on uneven development. Specifically, we contend that integrating the political economy of Marxist uneven development theory (e.g. Harvey, D. 1982; Smith, N. 1982, 1990 [1984]) with everyday-oriented social theory offers an approach that provides significant advantages for geographical research (also see Berki, M. and Sági, M. 2026; Mihály, M. and Fabula, Sz. 2026 in this issue). Providing an instance of this approach, the present study takes gentrification as its object, conceptualising it as an outcome of urban-scale uneven development (Smith, N. 1996). Centring its drivers and consequences, we investigate this spatial process through the lens of the everyday practices and lived experiences of the affected working-class residents.

That this perspective is suited to our objective is confirmed by an interpretation of gen-

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trification[3] situated within the logic of capital accumulation, which establishes a clear political-economic point of departure. However, it must be noted that while basically absent from uneven development research, an 'everyday' perspective has long been present in explanations of gentrification as a cultural and moral approach (Caulfield, J. 1994), albeit sparking significant debate. We concur with those who view this typically gentrifier-focused interpretation as the displacement of the working class by researchers themselves (e.g. Smith, N. 1996), and with those who advocate for re-centring the study of the displaced (e.g. Slater, T. 2009). Having responded to this call in our previous work, in this paper, we instead build upon the work of Paton, K. (2014), who examined gentrification from a working-class perspective and synthesised structure and agency at the level of the everyday. Yet, unlike Paton, we do not seek to identify class consciousness or a collective identity within the daily practices and strategies of individuals and households. Rather, our research question is how their changing everyday lives reveal various modes of participation in ongoing gentrification and how they attempt to negotiate their relationship to it. We argue that while uneven development imposes rigid structural constraints upon workers, in certain contexts it serves to differentiate not only the class as a whole but also its internal constituents.

We explore this argument through the specific lens of one ECE experience: the working-class quarters of Hungarian cities. Within this context, the traceable memories of those living today enable the retrieval of both old and new individual spatial experiences and practices. These have been embedded into the modes of production of space (Lefebvre, H. 1991 [1974]) under both socialism and neoliberal capitalism, while simultaneously contributing to the preservation of the working-class residential colony character of their respective districts. In particular, we draw upon research exploring these experiences and practices through narrative, semi-structured interviews and focus group research. These were conducted primarily with members of working-class households (31) and, to a lesser extent, with experts (13) who assisted in the long-term political-economic analysis. The empirical research was carried out in two case study locations: Nagysándortelep in Debrecen and the residential neighbourhood surrounding the Zsolnay factory in Pécs.

The paper is organised as follows. The following chapter highlights several key theoretical debates (concerning the nexus of uneven development, gentrification, and everyday life, and the enduring significance of the state socialist legacy), offering an opportunity to elaborate on the relevance of our proposed epistemological focus and to elucidate the conceptual framework of the empirical research presented as an illustration. A primary objective of the methodological chapter is to present the case study sites and highlight key findings from a pilot study that delineates the fundamental characteristics of the gentrification processes unfolding across these locations – the diverse responses to which, as shaped by workers' experiences, are further examined in a subsequent chapter. Chapter four traces the most significant historical conditions and turning points within the investment–disinvestment–reinvestment cycle of uneven development, leading to the emergence of today's spontaneous gentrification. The shifting political-economic frameworks illuminated by this approach not only clarify the divergences and commonalities of the everyday experiences and practices discussed thereafter, but also vice versa. Consequently, the concluding discussion provides a more comprehensive interpretation of the results yielded by

[3] Given that a number of scholars researching gentrification in CEE already consider the sheer diversity of gentrification concepts to be elusive (e.g. Sýkora, L. 1993; Kovács, Z. *et al.* 2015; Bernt, M. 2016), we deem it important to note that we have applied Neil Smith's (2000, 294) definition, which we believe best aligns with our aforementioned approach. Accordingly, 'gentrification is the reinvestment of capital in city centres in order to create space for a social class that is much wealthier than the one that currently occupies the space'.

our proposed dual approach; these findings facilitate a more nuanced understanding of both gentrification and the shifting agency of the working-class residents involved.

Theoretical considerations

We highlight three main strands of the theoretical considerations and scholarly discourses that have inspired the aims, questions, and claims of this article, justified its relevance, or conceptually framed our empirical investigation.

1) *Our aim to integrate the political economic perspective of uneven development with an 'everyday' approach* was motivated by a need for deeper insight and understanding of this spatial process. In the empirical study presented here, this complementary synthesis is employed primarily as an analytical tool, rather than with the intention of testing theory within the realm of everyday life (see Yeung, H.W. *et al.* 2025). We view everyday life in a manner akin to Katz, C. and Kirby, A. (1991, 264): 'The critical importance of social reproduction and everyday life in both theory and practice is that they are grounds for struggle in which active historical subjects reproduce themselves, their labour power, and the contradictory social relations on which production depends.'

It initially appeared surprising that even a systematic international literature review (Fabula, Sz. *et al.* 2025) found scarcely any trace of a link between the 'everyday' and uneven development (as a process interpreted from a Marxist perspective). This is particularly striking given that Neil Smith (1982, 1990 [1984]) – and others such as David Harvey (1982), who similarly regarded uneven spatial development as the 'engine' of capitalism – drew heavily upon Henri Lefebvre's (1991 [1974]) theory of the production of space. Lefebvre, H. (1971 [1968]) was, after all, one of the early pioneers in conceptualising everyday life. However, as Marston, S. and Smith, N. (2001) observed, Lefebvre paid relatively little attention to the theorisation of spatial difference within his interpretation of space – an omission that is all the more remarkable given his clear commitment to the 'right to difference'. Nevertheless, Smith, N. (1992a) did highlight a distinction that constitutes a cornerstone of Lefebvrian spatial theory: the differentiation between abstract space and social space. While the former is laid down through the activities of the state and the economic institutions of capital, the latter is constituted by the practices of everyday life.

Neil Smith, who ultimately formulated his theory of uneven development alongside the 'production of scale', raised questions in his 1992 book chapter regarding the intersections of scale, everyday life, and political economy that he considered essential for research. We believe these questions are directly translatable and highly instructive for the study of uneven development: 'How is scale constructed in everyday life, and how are different scales connected? What different roles do questions of class, gender and race play in the construction of different scales and how are these issues connected to questions of the economic, political and social determination of scale?' (Smith, N. 1992a, 78).

Among the empirical studies published since then, Jennifer L. Smith's (2022) article perhaps aligns most closely with our own approach, excellently demonstrating its inherent advantages. In her analysis of uneven development in South Africa, she revealed novel spatial configurations of inequality by integrating a political-economic perspective with a livelihoods approach. This framework allows for a deeper understanding of the ways in which individuals negotiate the manifold challenges that permeate their everyday lives.

2) It appears that the everyday-life perspective – and, thus, *the integrated approach we advocate* here – has proved more intuitive in *empirical research on gentrification* occurring at the local scale. Several works aligned with this perspective may inform our investigation (e.g. Davidson, M. and Lees, L. 2005; Alexandri, G. 2015; Sudermann, Y. 2015;

Doucet, B. and Koenders, D. 2018), although some of these – by invoking state-led gentrification – tend to focus primarily on the political-(economic) dimension. Studies situated at the intersection of gentrification and everyday life typically seek to uncover the impacts of gentrification on specific aspects of daily life and the experienced realities of various social groups (primarily the newly arriving middle class). It is far less common for researchers to adopt the inverse relation – as seen in Threadgold, S. *et al.* (2024) – and consider how this perspective might facilitate a deeper understanding of gentrification itself. However, they too treat gentrification primarily as a geographical context, failing to render visible the underlying economic (re)investment processes that drive it. As Threadgold, S. *et al.* (2024, 904) acknowledge in their inspiring work: 'gentrification emerged as a major theme in our research data but was not the object of study per se'.

Regarding *theoretical debates on gentrification*, these are most commonly structured around conceptualisation and the identification of causal drivers. By the 1990s, the initially polarising perspectives had sufficiently matured, such that integrating production-side and consumption-side explanations – or, to frame it differently, the complementary synthesis of economic and social arguments – became a fruitful path for many. In our view, this shift implicitly encompasses the integrated approach we advocate. Here, we highlight only two specific thematic areas that proved instrumental in crystallising our perspective and tailoring our empirical research accordingly.

One such critical point was first articulated by Rose, D. (1984), who questioned the 'uneven development' approach to gentrification (Smith, N. 1982) itself – a scepticism with which we fundamentally disagree. She noted a lack of investigation into the intersections of employment restructuring and changes in the reproduction of labour power within Marxist works. Rose argued that gentrifiers cannot necessarily be identified with uniform class positions; instead, she identified 'marginal gentrifiers' (a significant proportion of whom are women) who may possess needs similar to those they displace. In connection with this, she advocated for an analysis of 'life-style' alongside the functioning of the land and housing markets and the processes of production. The sphere of everyday life that she examined, in which 'life-style' is the key concept, is linked to the consumption habits and needs of residents (essentially gentrifiers). However, we found this to be too narrow for our own research, compared to the interpretation linked to experiences, practices, and struggles that we cited above (Katz, C. and Kirby, A. 1991). Furthermore, adopting this lens would have – contrary to our intentions – tilted our proposed integrated approach too far towards consumption-side logic.

In contrast to Rose, Caulfield, J. (1994) adopted an explicit 'everyday' focus in his gentrification research, placing weight on cultural factors such as taste, emotion, and aesthetics. In doing so, he interpreted the initiation of 'gentrification as a postmodern urbanism' as a consequence of the decisions and choices made by gentrifiers. We agree, however, with Smith, N. (1996, 43–44) that for Caulfield, among others, 'it is less a question of developing the connections, inherent in gentrification, between economic and cultural shifts, resulting in a new urban geography. Rather, in this vision culture virtually supplants economics …'. Ultimately, this perspective ensures that 'postmodern urbanism simply gentrify the working class out of the picture.'

For these reasons, we progressed towards the approach of Paton, K. (2014), who brought the everyday lives of the working class into focus by simultaneously examining structural and agentic perspectives within gentrification. However, we have extended this in two ways. Firstly, we allowed for the possibility that the working class should not be a priori confined to the position of the displaced. Secondly, – in contrast to the many excellent works focusing on collective resistance – we also sought traces of resistance at the individual or household scale. This shift was particularly necessary as our selected

case study sites are not scenes of 'classic', large-scale investor-led or state-led gentrification initiated by 'slum clearance'.

3) As these sites owe their distinct character largely to their *state-socialist past* – specifically the preservation of their working-class character through single-family housing – the third strand of scholarly discourse central to our analysis is the body of research on gentrification in the Central and Eastern European (CEE) region. Since the primary focus of these studies generally does not align with the integrated approach advocated here (works based on somewhat similar logic are, e.g. Csanádi, G. *et al*. 2007; Jelinek, Cs. 2011; Gentile, M. *et al*. 2015), we have identified the most relevant contributions for our empirical investigation at different intersections. Due to the sheer volume of this literature (see e.g. in Berényi, B.E. 2016), rather than providing an exhaustive list, we categorise these works by their research trajectories.

A key resource for this is the systematic literature review on urban regeneration and gentrification in CEE cities by Kubeš, J. and Kovács, Z. (2020), which synthesises the findings of nearly 80 (primarily English-language) publications. Within their classification, the studies examining the 'preconditions and driving forces of gentrification' are of particular importance to our work – specifically those employing *historical analysis* to understand the impact of economic interventions (investment, real estate markets) and state-led developments. These studies have facilitated the placement of our empirical findings within a broader spatio-temporal context. In the typology established by Kubeš, J. and Kovács, Z. (2020), the extensive literature on '*early-stage gentrification*' provided the primary parallels, even if the studies they referenced were fundamentally gentrifier-focused. Although their identified '*specific forms*' did not explicitly categorise gentrification linked to detached housing areas rooted in the (pre-) socialist past – which often involves partial social mixing – its characteristics remain significant for our analysis (e.g. Ruoppila, S. and Kährik, A. 2003; Feldman, M. 2000 in Sýkora, L. 2005). Finally, the *non-metropolitan character of gentrification* in Pécs and Debrecen – can also be defined by features such as 'delayed' or 'less dynamic and often incomplete' development (Kubeš, J. and Kovács, Z. 2020) – gains CEE-wide interpretability. This is further contextualised by the 'significance of EU funding' and the 'pivotal role of historic city cores in urban regeneration'. Insightful details on these processes are provided by the scholarly discourses compiled by Kubeš, J. and Kovács, Z. (2025) in their subsequent literature review, which specifically focuses on the gentrification of provincial cities.

Methods and areas of empirical research

Drawing upon the synthesis of uneven development and approaches to everyday life, our empirical study utilises a case-based method to further unpack the complexities of gentrification. The aim of the study was not the analysis of gentrification per se; rather, it sought to uncover its structural drivers, as well as its impacts and repercussions as expressed through everyday lived experiences and practices. For our neighbourhood-scale investigation, we selected Debrecen (202,130 inhabitants), and Pécs (139,412 inhabitants in 2025). These cities can serve as appropriate reference points for one another to understand the generalisable and specific characteristics of the political-economic background of gentrification. Despite their shared status as traditional regional centres and 'twin cities' within the national urban hierarchy (Rechnitzer, J. *et al.* 2004), their current developmental trajectories diverge significantly: Debrecen is experiencing a period of prosperity, whereas Pécs is in a phase of decline (Molnár, E. *et al.* 2018). These differences are rooted in local responses to post-socialist transformation, specifically the intensity of relations between local and central state actors (Póla, P. *et al.* 2023). As medium-sized Central and Eastern European cities, they provide a critical lens through which to examine the multi-scalar dynamics of uneven development.

Aligned with our goals, the selected field sites are both compact, former working-class districts situated on the inner-city fringe. Brick manufacturing in Nagysándortelep (Debrecen) and the pottery and porcelain industry in Zsolnay district (Pécs) played key roles in shaping their neighbourhoods. Unlike areas undergoing 'classic' urban regeneration, these neighbourhoods are defined by their specific industrial heritage, with the majority of the housing stock consisting of workers' family houses built in the 19th and 20th centuries. However, the two districts reflect the broader structural specificities of their respective cities. Debrecen is dominated by a semi-rural, detached built form with relatively larger plots (typically 300–400 m^2), while Pécs exhibits a denser, small-town urban fabric with smaller plots (200–300 m^2). In the latter, state-socialist and post-2000 interventions have introduced apartment blocks, increasing urban heterogeneity while maintaining the overall dominance of single-family housing.

To better understand the transformation of the selected sites for our research – which uncovers both drivers and impacts – we conducted preliminary studies prior to the investigation presented here. We supplemented fundamental statistical data with intensive site walk-overs, during which the specificities of localised gentrification were clearly discernible in both districts. Regarding our study areas, the 2011 and 2022 census datasets for Debrecen provided empirical evidence that validated our field observations[4]. In the absence of such data for Pécs, we employed a comparative stock condition survey, utilising our prior field surveys (2008) conducted before the European Capital of Culture developments as a baseline for a 2024 follow-up. We documented the building stock adjacent to the Zsolnay factory by photographing technical and visual amenities[5], mapping the observed processes, and categorising the subsequent morphological changes.

The transformation of Nagysándortelep research area (0.8 km^2) is defined not by uniform gentrification, but as a mosaic of asynchronous spatial processes (*Figure 1*). In the northern and central areas, physical and social appreciation reinforce one another, evidenced by the dual rise in university graduates and housing quality. However, this correspondence is inconsistent across the territory. In the central core, physical renewal outpaces social restructuring, suggesting a process of *'in situ'* gentrification where original residents could act as 'occupier-developers'. Conversely, the western margins exhibit social displacement or generational shifts that precede capital investment, with rising educational attainment lagging behind physical improvements. Despite these hotspots, much of the district experiences 'quiet appreciation' – a subtle, sporadic upgrading of the urban fabric without significant spatial disruption. Ultimately, in this initial stage of spontaneous gentrification, the area functions as a fragmented townscape of dynamic transformation, stagnant enclaves, and transitional spaces, rather than a monolithic gentrifying front[6].

We conducted the survey in the central, most emblematic core of the Zsolnay district[7]

[4] Using data from the last two censuses (2011, 2022) for Nagysándortelep, we constructed two separate measures: a Social Upgrading Index (SUI) based on variables illustrating social status, and a Housing Upgrading Index (HUI) based on housing quality indicators. These two indices were then combined using a standardised z-score method to create a comprehensive Gentrification Likely Index (GLI), along which specific gentrification categories were defined.

[5] A similar method was used by Lichtenberger, E. *et al*. (1995) for Budapest neighbourhoods.

[6] Features of several gentrification types delineated within the CEE context can now be recognised in certain parts of Nagysándortelep. These include, for instance, 'incumbent upgrading' and 'stealth gentrification' (Kovács, Z. *et al*. 2015; Kubeš, J. and Kovács, Z. 2020). For our purposes here, however, the decisive factor remains the unequivocal presence of gentrification as applied in our own conceptual framework.

[7] The designation 'Zsolnay district' refers to a former working-class quarter spanning approximately 1 km^2, whose spatial development and demographic growth were intrinsically tied to the factory's presence. For the purposes of this study, however, the most distinctive neighbourhood is the empirically surveyed area delineated on the map, where the spatial imprints of 19th-, 20th-, and 21st-century urban processes exist in immediate proximity to one another.

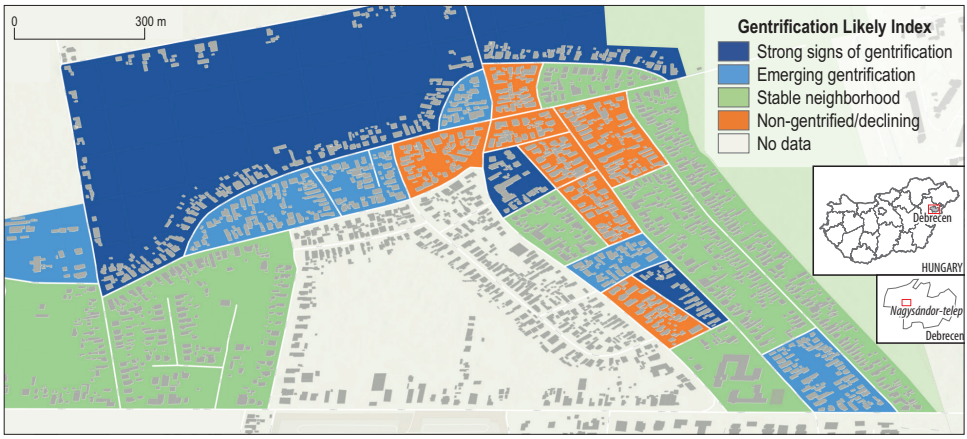

Fig. 1. Gentrification in Debrecen, Nagysándortelep district (2011–2022). *Source*: Authors' own edition based on field surveys and data from the 2011 and 2022 censuses.

(approximately 1 km²; *Figure 2*). This analysis emphasises building-level transformations as a reflection of social change. Similar to Debrecen, renewal is highly fragmented; contiguous improvements are limited to public infrastructure (road surfacing and cycle paths), while property renovation remains concentrated along the axis connecting the city centre to the Zsolnay Cultural Quarter. Beyond investor-led infill projects – primarily small-scale, high-quality apartment blocks – the area exhibits a 'neighbourhood effect' of modest, sporadic renewals[8]. However, the persistent presence of severely dilapidated, near-uninhabitable housing in immediate proximity to the revitalised Zsolnay Cultural Quarter – a site of significant state-led investment – seemingly contradicts classic rent-gap-driven gentrification (Smith, N. 1982).

Ultimately, Pécs presents an even more polarised mosaic than Debrecen. Although measurable data on social transformation are unavailable here, if we consider housing market shifts, which suggest that population turnover is characterised by a rise in social status, then this process can undoubtedly be regarded as gentrification.

Within the empirical research of this article, the components adopting a political-economic approach to investigate the drivers of gentrification primarily involved secondary analysis of local historical and cartographic sources, urban development documents, and local newspaper articles, complemented by expert interviews. These interviews with 7 in Debrecen and 6 in Pécs, which aimed to examine socio-economic changes and development characteristics in the areas under study, enriched our understanding with insights from local politicians, institutional leaders, social workers, and local historians.

At the core of our qualitative methodology were narrative interviews, integrated with a semi-structured approach: 13 in Debrecen, and 18 in Pécs. These interviews aimed to explore everyday life, spatial experiences, and practices in the context of gentrification. Consequently, after gaining insight into the participants' life histories, we discussed in greater detail their migration trajectories, their use of space, and their assessments and perceptions of changes in their housing and neighbourhood. Furthermore, we examined their lived experiences of conflict, views on urban development policies, and the potential forms and opportunities for resist-

[8] Gentrification limited to a few streets and working-class enclaves is a well-known phenomenon in both Western and CEE contexts (Marcuse, P. 1986; Smith, N. 1996; Chelcea, L. 2006).

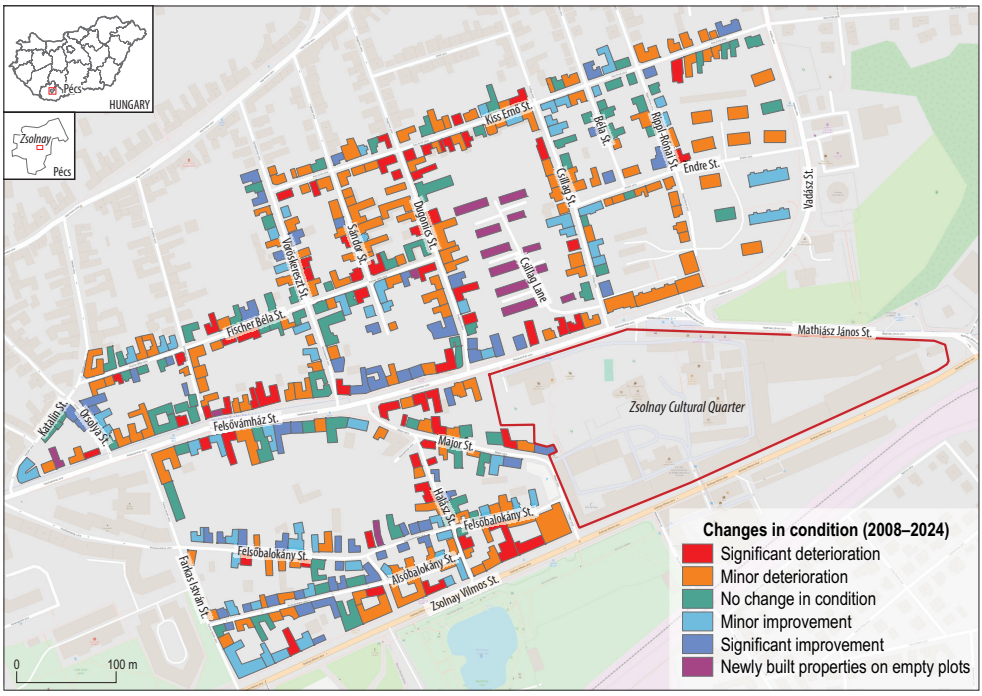

Fig. 2. Gentrification in Pécs, Zsolnay district (2008–2024), based on the changing technical state of housing. *Source*: Authors' own edition based on 2008 and 2024 field surveys.

ance. These dialogues were conducted among a fundamentally working-class and precarious population that varied in terms of age, gender, ethnicity, marital status, and ability. With a few exceptions, these 1–2.5-hour interviews were conducted in the respondents' homes between August 2023 and October 2025, significantly enriching our fieldwork experience. A focus group interview with 13 marginalised residents in the former location provided an opportunity to discuss local livelihood, financial hardship, and community development issues.

The backgrounds and driving forces of gentrification – from a political-economic perspective

By examining the key features and changing dynamics of development and underdevelopment, as well as investment and disinvestment – central concerns of the political-economic approach to uneven development – we can better understand the gentrification currently occurring in our sample areas. Our study places particular emphasis on exploring the role of workers in this spatial process, which necessitates tracing their contemporary presence back to its genealogies in the initial formation of working-class districts.

Pre-capitalist – capitalist period: the birth of 'working-class neighbourhoods'

Nagysándortelep originated in the late 18th century as a result of Debrecen's historically significant brickmaking industry (Balogh, L. 2020). The 19th-century capitalisation of Debrecen – hitherto a predominantly agrarian regional hub – precipitated the consolidation of industrial capital. However, the munici-

pal leadership only tacitly tolerated even the permanent settlement of brickyard workers within this territory until 1909 (Papp, J. 2017). The ownership of these exceptionally small building plots – and, thus, the mechanism of control – has been retained to this day (Sápi, L. 1972). Their residential neighbourhood in Nagysándortelep suffered from disinvestment by the local government, as evidenced by the complete lack of basic public utilities and institutions until the 1930s (Sápi, L. 1972).

The development of our investigated area in Pécs, the Zsolnay district, into a distinctive 'industrial/working-class neighbourhood', is, similarly to Debrecen, closely linked to the city's first significant wave of industrialisation in the second half of the 19th century. The more diversified industrial character of the city is – comprising mining, light industry, and food processing (Faragó, L. 2010) – found its most globally renowned representative in the Zsolnay Porcelain Manufacture. Employing 900 people by 1910, the factory acted as the most powerful agent in the spatial production of the district (Pilkhoffer, M. 2021). The company's management invested significantly in urban infrastructure and also contributed to education, healthcare, and public welfare. Furthermore, the company commissioned the construction of brick houses for a portion of its workforce, offering rental units that exceeded the prevailing standards of the era. However, much like in Nagysándortelep, the majority of the modest dwellings were self-built by the labouring class; yet here, they produced a small-town, terraced spatial structure rather than a rural morphology. As a result, the Zsolnay district developed a unique building stock that, while primarily consisting of family houses, was more diverse in terms of quality and ownership compared to Nagysándortelep.

State socialist era: partial investment, disinvestment leading to slumification

The preceding wars and economic crises eventually transitioned the studied districts, bearing the marks of disinvestment, into a new mode of production of space (Lefebvre, H. 1991 [1974]) in state socialism. However, the industrialisation that played a central role in the socialist state's party politics generally favoured the development of Pécs. State investments, concentrated dominantly in heavy industry, primarily targeted other districts of the city, causing the Zsolnay factory and its environs to lose their former primacy. Consequently, in the urban planning and development schemes of the early 1970s – much like in the 1961 plan for Nagysándortelep – the predominantly low-density residential fabric and underdeveloped infrastructure served as a rationale for 'de-development' and the visionary prospect of total slum clearance (Kozma, G. 1994). The official justification in Pécs clearly reveals an inability to intervene, covered up by the dominant ideology: the explanation for executing the plan – which ultimately failed to materialise here at the neighbourhood level either – would have been 'living conditions unworthy of the socialist way of life' (Sipos, B. 2024). Both cities preferred mass housing construction, but most of this took place outside the areas under study. Even the 300 dwellings constructed on the fringe of the Zsolnay district during the 1980s – financed through coordinated council, party, and state-bank investment – failed to meet the residential demand generated by a porcelain factory workforce that had, by then, reached 1,800 employees.

One consequence of the state-led production of space process in Hungary – conceptualised as 'under-urbanisation' (Konrád, Gy. and Szelényi, I. 1971) – was the private construction of single-family houses, which 'retained' the population in villages. This serves as a prime example of how individual responses to spatial inequalities became a mass phenomenon. The studied districts were no exception: with or without company or state subsidies, people continuously built or renovated their often still-dilapidated houses themselves (who could be considered the first working-class 'occupier developers').

Significant investments by the local state and the state-owned companies neglected not only the housing stock but also the development of infrastructure and public utilities. Furthermore, alongside the existing working-class and precariat layers, impoverished families – a significant proportion of whom were Roma – were relocated: in the Zsolnay district, into deteriorating council housing, and in the case of Nagysándortelep, towards the end of the era (partly as a result of historic city centre rehabilitation programmes), into the district and its immediate surroundings. As a consequence, slumification intensified in these areas, increasing the stigmatisation of the districts in question. In the final decade of state socialism, the Pécs City Council eventually launched an early urban regeneration project (Egedy, T. 2009). This intervention introduced an outpatient clinic, a retirement home, modern apartment blocks, and a starter housing block consisting of 120 (19–30 m² each) apartments were built on the periphery of the district in Lánc Street; while this partially renewed the area, it also sowed the seeds for subsequent problems.

Post-socialist – (new) capitalist period: moderate gentrification

The period since the regime change cannot be regarded as uniform either. During the 1990s, the systemic crisis linked to the industrial sector left discernible imprints on both study areas, reflecting a broader process of deindustrialisation. In 1999, the last brick factory in Nagysándortelep closed its doors (Horog, M. 2022). The local authority remained absent from residential property development, maintaining only a limited stock of emergency housing within the study area. However, in the early 2000s, by clearing both local and adjacent Roma settlements – described by one expert interviewee as a 'series of evictions' and a form of 'cleansing' – it acted as the catalyst for a reinvestment process that had a perceptible impact on Nagysándortelep. We believe that this mode of intervention clearly fits into the conceptual framework that regards 20th and 21st-century gentrification as a global urban strategy (Smith, N. 2002). This strategy of neoliberal capitalism – documented in numerous other Central and Eastern European cities (e.g. Jelinek, Cs. 2011; Nagy, E. and Timár, J. 2012) – is most evident in the transformation of the area separated from Nagysándortelep only by a busy main road. The municipality cleared the city's most stigmatised residential site, the so-called 'Citromsziget' (Lemon Island), to facilitate the entry of private capital, subsequently replacing it with the new 'Fészek' (Nest) middle-class residential complex, which is an illustrative example of new-built gentrification (see e.g. Gentile, M. *et al*. 2015; Holm, A. *et al*. 2015).

Industrial estates and shopping centres were developed on the fringes and in the vicinity of Nagysándortelep through largely similar collaborations. As a result, during the 2000s, the settlement gradually became 'wedged into a renewing environment' (Horog, M. 2022, 32). The development phase anticipated under these conditions could have been realised through a process of social urban regeneration – an approach clearly discernible within the local authority's strategic planning documents (Debrecen MJV 2008, 2014, 2022). In the absence of the anticipated EU and central state subsidies, the steering of local housing market dynamics –and the resulting reinvestment – has been devolved, at least for the time being, to small-scale investors and occupier developers[9]. Indicators of educational attainment and housing quality already showed marginal improvements between 2001 and 2011, however, these trends intensified over the following decade, signalling the onset of a spontaneous process of gentrification (a phe-

[9] Given that capitalist relations of production of space had become dominant by this period – whereas such terminology may have been contested under state socialism – it is our view that Neil Smith's (1996, 69) definition of 'occupier developers' can now be unequivocally adopted: namely, those 'who buy and redevelop property and inhabit it after completion'.

nomenon previously identified in earlier research of Horog, M. 2022).

Alongside numerous similarities – partly due to the 'wait-and-see' approach of both municipal and private investors – our study area in Pécs experienced a similar process of decline (underdevelopment), reaching a potential turning point in the 2010s. Its historical assets and dilapidated state (Pirisi, G. *et al.* 2008) presented such a contrast that the civil initiative 'European Capital of Culture 2010 – ECoC' project designated it as a core area for urban renewal (www.pecs2010.hu). The functional conversion of the Zsolnay factory into a cultural hub attracted an unprecedented scale of EU investment to the city 140 million EUR) and specifically to the study area (40 million EUR) (Trócsányi, A. 2011). Development commenced in 2009. However, due to local political instability and the 2008–2009 global financial crisis, investors (local, national, and foreign alike) purchased several plots but withheld development, awaiting the success or failure of the flagship project. Except for the central Zsolnay Cultural Quarter and its related minor infrastructural improvements, the planned major investments either materialised outside the studied area or were abandoned altogether. Nevertheless, the ECoC project did deliver infrastructural upgrades (e.g. cycle paths, bus routes) that somewhat appreciated the area's value. Consequently, a degree of development has been perceptible since 2010; however, it remains sporadic and slow.

The intensification of gentrification is further constrained by the fact that many residents were unable to take advantage of the right-to-buy schemes following the transition; consequently, the proportion of municipal housing remains relatively high (reaching up to one-third). Neither the owner nor the tenants possess the capital required for the modernisation of this stock. While urban policy identifies issues of 'punctiform segregates' and 'blocks at risk of segregation' (Pécs MJV 2022), it remains a vital research question as to how the policy responses to these classifications will steer the trajectory of gentrification. Indeed, the left-wing municipal leadership – which eschewed urban rehabilitation based on public-private partnerships – was ultimately unable to prevent the total erosion of the aforementioned 120-unit municipal block. Built on the cusp of the regime change, the building's decay forced the council to resolve upon its evacuation in 2022.

Ultimately, through the political economy perspective applied in these case studies, we have sought to contextualise the circumstances surrounding the onset of currently observable gentrification within a historical framework. It was not our objective to take a definitive stance in the debate regarding whether a sufficient rent gap (Smith, N. 1982, 1996; Nagy, E. and Timár, J. 2012; Holm, A. *et al*. 2015) or indeed a value gap (Hamnett, C. and Randolph, W. 1984; Clark, E. 1991; Kovács, Z. *et al.* 2013) has emerged in the given areas, or which of these might be inducing gentrification in the districts under investigation. For our purposes, the central question is how the workers whose significant presence to this day has been presented by these case studies align with the structural conditions that facilitate reinvestment. The situation in which, due to specific shifts in tenure relations, they may be present not only as the victims of underdevelopment struggling with the most severe hardships but also as current or potential occupier developers, renders the study of their spatial experiences and practices highly justified.

Working-class residents' daily lived experiences of gentrification

The relationship of working-class residents to state-led gentrification resulting from 'classical' displacement

The working-class and marginalised groups, whose members are known as the classical subjects of displacement in 'Western' gentrification, have primarily been studied in Hungarian literature within the context of large-scale revitalisation and rehabilitation

programmes of neoliberal urbanism (e.g. Csanádi, G. *et al*. 2007; Jelinek, Cs. 2011; Nagy, E. and Timár, J. 2012; Czirfusz, M. *et al*. 2015; Timár, J. 2019). In the Zsolnay district, the municipality is continually vacating its buildings – most of which have already become uninhabitable – yet large-scale interventions here, much like in Nagysándortelep, have fundamentally taken place in neighbouring areas (such as the Lánc Street block, 'Citromsziget', and certain Roma settlements). Nevertheless, their impact is undoubtedly palpable in the everyday lives of working-class households in the districts under transition.

In the narratives of our interview partners (except for one or two accounts from professionals trying to protect Roma families from eviction), solidarity regarding displacement was not markedly expressed. Some voiced their former fears, stemming from both the proliferation of drug use and crime in Pécs's Lánc Street before its eviction, and the deep poverty of the Roma and non-Roma residents of the 'Citromsziget' in Debrecen. We encountered an interview partner who had so deeply internalised the stigmatisation of 'Citromsziget' that she never even entered the area. We could assume that this is consistent with the gendered nature of urban fear (see in Sági, M. 2022). However, this same person sharply criticised the stigmatisation of Nagysándortelep by other city dwellers. In contrast, an elderly interview partner, a former female brick factory worker, holds different memories of 'Citromsziget', through which they used to walk to work during the socialist era:

'There were times I'd be off [to work] for midnight, and I'd just go on me bike. And… even at 11 at night, we'd be coming home, singing away. Well... it never even crossed our minds to be scared. … Here, in 'Citromsziget': well… I don't remember there being that many bad people about, so where's this [stigma] coming from? I reckon it's more that they were just poorer, or I don't know what it's from.'

Even if carried out beyond the boundaries of the working-class districts under investigation, redevelopment may have contributed to an improvement in the urban image of the areas in question (Csoba, J. 2020) and to their appreciation on the real estate market. However, those belonging to the working-class or marginalised strata of Nagysándortelep typically did not perceive the new-built gentrification of 'Citromsziget' as a positive change – for instance, as the elimination of the source of their fears (for the international debate on its positive and negative impacts, see Atkinson, R. 2004; Szirmai, V. 2019). Instead, their narratives brought to the fore social conflicts that had never been experienced before. In the development of the middle-class 'Fészek' residential complex, they experienced their own segregation and exclusion:

'Proper rich folks live over there,' 'proper houses just sprung up overnight.'

This development brought the reality of uneven spatial development into their daily lived experience. One middle-aged female worker, perceiving the roles of both capital and the local state, resented the 'unjust' and vast discrepancy in property prices (mentioning house prices of 5 million versus 50 million HUF) on opposite sides of the dividing road. Furthermore, she took issue with the fact that a local political actor only had the side of the road facing the residential complex 'cleaned up'.

Even more distressing for the residents of both districts studied is the closure of their local primary schools, cited as being due to a lack of funding and a declining pupil population. Although we have not studied the details of these closures, given the current levels of nursery-stage segregation, it can be assumed that the state – alongside the disparate mobility options available to low-status and new, high-status residents – acts to reinforce the reproduction of educational spatial inequality and exclusion (e.g. Velkey, G. 2022; Béres, A. 2025; Béres, A. *et al*. 2025).

Ultimately, while the social group under scrutiny has not been a casualty of the afore-

mentioned large-scale, displacement-led regeneration projects, there are no guarantees of their future protection. Alongside the imperatives of capital accumulation and urban policies that deploy gentrification as a strategic tool of urbanism (Smith, N. 2002; Nagy, E. and Timár, J. 2012), their very working-class positionality constitutes a source of potential vulnerability.

The role of former and current working-class residents in contemporary spontaneous gentrification

The reserve army of displacement – tenants

A segment of the residents who hold or formerly held working-class status can be categorised within the group of tenants described in classical gentrification studies and may be regarded as a 'reserve army of displacement' that facilitates the process of gentrification. During our research, we encountered numerous interview partners who were born into markedly poor working-class families during the socialist era – often in sub-standard, multi-generational, or overcrowded housing, or within Roma neighbourhoods – and it is not uncommon for them to still lack homeownership today. Alongside them are those who have experienced more fortunate periods in the past, but who now struggle with chronic illness or disability, or must care for a disabled family member; those who have lost their jobs, or who, following divorce or bereavement, must raise children alone; and those subsisting on extremely low pensions. This social position, in turn, makes it impossible for them to break out of their status as tenants.

Some *rent their flat or house from private landlords*. In Pécs, we interviewed a tenant of a renovated apartment who has been unsuccessfully attempting to relocate. Within the newly gentrifying environment, there is a lack of housing supply that accommodates both their income level and their requirements as a person with a disability. However, the tenants in our study are more typically characterised by the fact that, to survive, they accept – or are forced to accept – extremely poor housing conditions. Some attempt to endure these circumstances, and from this perspective, they appear as 'passive' actors in district-scale spatial processes. This is not true of their own lives, however, as this endurance often requires significant attitudinal and, above all, physical effort. Our Roma male interview partner from Nagysándortelep hoped for a better fate for his child than the one he had. He complained that:

> We've got no water in the house, and that means we're trekking down [to the end of the street] for the well water.'

Registered as disabled due to a spinal disc herniation and suffering from severe heart disease, this is a daily practice he is forced to undertake. Having lost faith in the possibility of mobility, some seek a better bargaining position with their landlord to retain their rented home and, ultimately, remain in the slumified space. We learned of one tenant, for instance, who has so far managed to avoid eviction by appealing to their landlord's 'social conscience'. However, such individual bargains are only possible until the rent gap/value gap ultimately incentivises the owner to renovate or sell, or until plot speculation 'bears fruit' due to a municipal development or revitalisation plan (such as a proposed road construction in Debrecen) and the resulting expropriation.

Alongside these strategies, the possibility of payment in kind (reciprocity) can also be deployed. This is precisely what the aforementioned disabled man does: by assisting the owner with daily shopping and administrative tasks, the tenant is currently exempt from paying rent – though, of course, this remains a very precarious success. Several others attempt to improve their income through casual labour, even while ill, though accounts suggest that substance abuse and self-destruction can also emerge as a form of reaction. Based on our experiences, submitting an application for social housing was

seen as the only viable option for relocation among these tenants. Their narratives regarding the years spent on waiting lists reveal a sense of paternalism – an expectation of state care carried over from the socialist period. Ultimately, for those tenants who attempt to preserve or improve their home – the most vital micro-space of their daily lives – any delay in their displacement is merely a superficial achievement. In reality, they are contributing to the disinvestment and slumification that precedes reinvestment, thereby further widening the rent gap.

The situation and prospects of *those who already rent from the municipality* (a possibility only available at our Pécs site) are not significantly different, as the local authority currently fails to invest in or renovate these properties. According to one interviewed expert, this housing policy is no longer sustainable; he argues that the cost of current 'social sensitivity' is being borne by 'Pécs taxpayers', while the dilapidation of the properties in question has become untenable. This situation divides the tenant group as a whole. While those on the waiting list demand social provision, they are often impatient with those whom the municipality tolerates despite non-payment of rent, believing this diminishes their own chances. For instance, a Roma worker living with his wife and teenage child in a single-room flat in the Zsolnay district – which is in very poor condition – seeks to use this very tactic to acquire a larger home:

'I'll tell you straight, I've already been down to the council; I want them to write this place off as unfit to live in.'

His life trajectory is, among other things, a history of the struggle to create a home. Highlighting just a few moments: during the period of higher Roma employment, he worked in the uranium mines for 15 years and later served as a social worker; he has also experienced homelessness and even squatting in a vacant municipal flat. After officially reporting his occupancy and consistently paying for utilities and rent, the municipality eventually granted him a formal tenancy agreement. His case illustrates that while certain strategies in the individual–municipality relationship can prove effective and successful in the short term, the large-scale arrival of private capital may still displace this stratum through gentrification – even if they merely wish to move within the same district rather than leave it.

Working-class homeowners – old and new occupier developers

Due to the unique nature of their situation, we consider it important to highlight the specific working-class group whose members, at first glance, appear to be participants in the ongoing gentrification who cannot be displaced, as they live in their own family homes. One characteristic period of their emergence as occupier developers was the first two decades of state socialism; during this time, they purchased small, inexpensive houses or plots close to their workplace. Driven by growing households, they gradually built, extended, or modernised their properties. In the absence of state investment or professional developers, they were effectively the only developers of that era. Others may have purchased property during the subsequent period of slumification, or even inherited homes or parts of houses from their working-class parents during the initial gentrification after the 2000s, becoming contemporary occupier developers by gradually upgrading these units.

Examining their everyday lives and spatial practices reveals that their relationship with contemporary gentrification is by no means unidirectional; thus, we can study more than just the impacts of uneven development upon them. Given their position, which can be characterised as that of occupier developers, the relevance of examining a reverse effect also arises. From the perspective of their direct influence on gentrification, we have identified at least two distinct patterns of action.

One of the observed life trajectories belongs to those who (or whose parents) were active producers of urban space during the state socialist era, but who, *despite remaining homeowners, can no longer be considered developers today*. Neither they, nor their parents 'blended in' with the prevailing mechanisms of spatial production, either under state socialism or today. In the former period, they indeed assumed the role of occupier developers. However, in rebellion against the alternative of housing estate life, which was available to some, they actively contributed to the development of the studied districts by building detached houses with gardens. In doing so, they also perpetuated practices dating back to pre-socialist spatial production: they kept pigs and poultry to supplement their livelihoods, thereby preserving the rural character of the area. They followed the Central and Eastern European (CEE) pattern of everyday life that Gerald Creed (1998) termed the 'domestication of socialism'. Some who followed this path can no longer maintain their former role as agents, having been dragged down by the crisis of the post-socialist transition, deindustrialisation, and unemployment. Unable to break free from their declining social status, they themselves reinforce disinvestment and have become the sufferers of slumification. However, their position as homeowners currently protects them and their families from total displacement – at least as long as gentrification remains patchwork-like and slow, or until the municipality and capital enter these districts more forcefully as professional developers. For the time being, therefore, the members of *this group act as a slow-down gentrification.*

The same applies to those who, even if they no longer wish to upgrade, could theoretically sell their houses, which are sometimes in remarkably good condition and of high quality, but choose not to. As several participants emphasised in the focus group interview, they would not move for any amount of money from the house that is the fruit of their own two hands (and sometimes the labour of dozens of people helping in informal mutual aid, known as 'kaláka'). They are accustomed to and fond of their homes and/or the district. Thus, they do not conform to the market logic offered by uneven development, yet their often valuable property also protects them. In their case, change will only come when their children take their place – that is, through an intra-family generational shift. As one expert interview partner in Pécs aptly remarked:

'Here, gentrification is age-based; it happens on a "one-out, one-in" basis through natural wastage.'

An example of this is a former brickyard worker couple in Debrecen, now in their 80s, who came from a background of settlement poverty. With hard work and some assistance from both their family and the factory, they built their first small house in the early 1960s; two decades later, they progressed from there to build a large, more modern home. They, too, voiced their strong attachment to their house:

'We're always talking about it, saying, "Well, maybe we should sell up…" "Aye, sell up." And that's as far as it goes…. "I tell my son, look, son, it doesn't work like that – just having a thought and then handing it over! But where would we go?" [Quoting her son:] "Oh, you can buy somewhere else and just think what this place is worth now!" Well, of course, maybe they think a bit of cash would be nice… But my old man, he won't have it, 'causes us in a block of flats? Never us! That's not for the likes of us, 'causes this is what we're used to.'

Such attachment, however, is by no means exclusively characteristic of the elderly when weighing up shifting real estate market opportunities. In Pécs, a middle-aged mother of two argued critically against the attitude of the young people she sees around her, who sell their inherited homes; in her view, this further fuels the process of alienation within the transforming district:

'They don't want to be tied to the spot. … So, those connections aren't there anymore, that feeling of "this is my childhood home"; instead, people just go wherever the work is, and they don't bond with the place.

… Maybe that's good in one sense, because they go where they can earn more or where there's opportunity, but I don't know… I feel like I'm not giving my children any values that way. If they can't form a bond with this, how are they ever going to bond with a person, or a partner?'

The type of change in ownership she describes produces a stratum of *people who suddenly act as accelerators of a gentrification* that their parents had previously slowed down. Even if property prices in the neighbourhood remain below the city average, they are high enough to attract buyers or developers of a higher social status than the original residents. Alternatively, if they choose to move into the inherited home themselves, they frequently extend and renovate it.

Finally, there are those who, as occupier developers, 'blended in' with the process of contemporary gentrification; that is to say, their everyday practices and decisions actively fuel it. Take, for example, the couple in Pécs who, during the decline of their workplace – the Zsolnay factory – sought a livelihood in Austria for 20 years. Using the higher income earned there (informally), they have been continuously extending their house since 1987. Having retired, they are away from considering large-scale relocation; however, the return of their divorced entrepreneur daughter and grandchildren has introduced 'gentrifiers' into their home.

Taking all our interviewees into account alongside the homeowners, their attitude toward their broader lived space – the working-class district – is strongly thematised by a sense of 'neighbourhood identity' in Debrecen, and a nostalgia for belonging to the Zsolnay factory in Pécs. In judging the severity of negative changes, differences in their class position and their identities – defined by ethnicity, gender, age, and ability – as well as variations in their individual spatial experiences, all play a role. Among the residents of Nagysándortelep, a significant change is voiced in the form of a Roma/non-Roma divide, which was not previously characteristic of the area (Horog, M. 2022). Meanwhile, in the Zsolnay district, the primary concern is the 'occupation of space' by homeless people and 'all sorts of characters' in slumified areas (and around homeless shelters). When searching for those 'responsible', evaluations of the post-socialist transition or, in Pécs, shifts in local politics surfaced – often differing completely depending on the worldviews and experiences gained under socialism.

However, gentrification as a recent everyday experience of social relation shows clear similarities across the board: for many of our interviewees, it manifests either in deteriorated neighbourhood relations or alienation (*'we don't even say hello to each other'*), conflicts over differing lifestyles (*'they're always building, they're noisy'*), or, for example, a sense of being looked down upon. We found no trace of collective resistance against this situation. One might assume that such experiences would lead to a form of displacement (and, thus, accelerate gentrification) even among working-class homeowners – meaning they would react by selling their property. However, we encountered only two couples in Debrecen who are considering this option of leaving the quarter. However, the current conditions of the city's real estate market make it difficult for them to preserve one of the primary joys of their daily lives: the detached house lifestyle.

Discussion and conclusions

In this paper, we aimed primarily to highlight the advantages of our proposed dual approach to the study of uneven spatial development – specifically gentrification – which integrates political economy with a focus on everyday life.

While our empirical research – aimed at illustrating these advantages – sought to understand the spontaneous gentrification of Hungarian urban districts (Debrecen, Pécs) that retain traces of working-class garden estates, specifically from a working-class perspective, we have arrived at new findings that invite further reflection on both epistemological and ontological questions:

1. Through studying the multifaceted relationship of the working class to uneven development and gentrification, a broad spectrum of their space-producing roles has come to light – ranging from the displaced to (potential) developers or even gentrifiers – some of which remain unknown or under-researched in many medium-sized and large cities.
2. By approaching workers as historical subjects – whose everyday experiences and practices we studied within a broader historical context (under both state socialism and capitalism) and through their own life histories – mutually constitutive correlations between structure and everyday life, and the dynamics of capital investment–disinvestment–reinvestment and individual/familial decision-making shifts have been revealed. These dynamics demonstrate the causes and consequences of gentrification in their dialectical relationship.

The further details of these findings are presented in the following discussion:

By exploring the patterns of roles played in ongoing gentrification through the everyday practices and strategies of both former and contemporary workers, we found that during the process of equalisation-differentiation – a hallmark of uneven development (Smith, N. 1990 [1984], 1996; and see also Tagai, G. and Kronstein, B. [2026] in this issue) – spatial differentiation occurs not only along class, ethnic, or age-based lines, but the working class itself undergoes a process of internal differentiation. Beyond their direct or indirect displacement (Marcuse, P. 1986; Paton, K. 2014; Elliott-Cooper, A. *et al*. 2019), workers may assume a variety of roles in the production of gentrifying space.

However, it must be emphasised that the different patterns of everyday practices related to various groups of the studied working-class and precarious populations, which are historically contextualised and geographically situated (in space and scale), are also partial and fluid. In our study, the patterns of everyday practices of individuals and households, examined through the lens of gentrification, were disentangled solely as an analytical method. These patterns are not fixed to income levels, ethnicity, gender, age, ability, or moral values. This is because the subjects of everyday life – and the perspectives from which it is experienced – are themselves in a state of constant flux, embedded within a space continuously constructed through social interactions: that is, within 'space-time' (Massey, D. 1994).

The integrated approach of our case study has shed light on this fluidity, temporality, and partiality, as well as the trajectories that give rise to the specificities of contemporary gentrification. The revealed system of correlations is well-illustrated by the fact that, when the local state, during the *era of state socialism*, left the studied underdeveloped neighbourhoods (or the greater part of them) in a state of disinvestment, it failed to 'cleanse' them despite its intentions. At the same time, following central state housing policy – as seen elsewhere in the CEE region (Szelényi, I. 1983) – it generally did not support (unskilled) workers either. Furthermore, within a system proclaiming 'proletarian power', it would have been difficult under such circumstances to prevent workers from engaging in self-built housing (as its predecessors had done in Debrecen during the pre-capitalist period). In this historical context, the transformation of a segment of the working class into occupier developers can be seen as a form of resistance. They were able to achieve this within the framework of socialist redistribution by 'domesticating' it (Creed, G. 1998) through the second economy, informal labour, and mutual self-help construction. Consequently, those sections of the working class who were in a position to do so (due to their income and family circumstances) contributed to the survival of their micro- and meso-spaces and the preservation of the neighbourhood's family-house character, thereby refusing to 'blend into' the spatial processes typical of state disinvestment. Meanwhile, those who belonged to the marginalised layers of the working class, particularly Roma communities living in ex-

tremely poor housing conditions, became participants in the slumification exacerbated by disinvestment, which foreshadowed their subsequent displacement by gentrification.

At the onset of *post-1990 capitalist spatial production*, however, it was the economic crisis of the post-socialist transition that most conspicuously differentiated the studied working-class strata. These structural changes, stretching from national and international scales down to the level of everyday life, specifically the domain of social reproduction, were interwoven with family relations and individual life circumstances. As observed in other gentrifying CEE neighbourhoods (see in Kubeš, J. and Kovács, Z. 2020), it can be argued that the property markets of these overall underdeveloped spaces were shaped by the fact that socialist disinvestment established the very conditions for capitalist investment (Nagy, E. and Timár, J. 2012). It was through this specificity (among others) that the mechanisms of capitalist uneven development were set in motion.

Due to the dynamics of urban-scale uneven development, the studied neighbourhoods have so far experienced only sporadic, spontaneous gentrification, in which workers participate through a shifting array of old and new roles and everyday practices. The reserve army of displacement (tenant households) indirectly fuels gentrification by deepening the rent gap or value gap. Some workers, who were once able to act as developers of their own homes within the socialist space-time, may by now have 'descended' into this group; while they might have retained their status as house owners, capitalist conditions no longer allow them to resist the now capital-driven reinvestment and gentrification. As a means of 'domesticating' neoliberal capitalism (Smith, A. and Rochovská, A. 2007), they can primarily deploy only their detached houses and domestic food production. Conversely, those who have managed to maintain a position – sometimes even elevating their social status – that enables them to act as occupier developers in today's gentrification do not necessarily exploit this opportunity; not everyone chooses to 'blend into' the logic of the local real estate market. As we have demonstrated, this may stem from moral motivations (e.g. place attachment), which can also be rooted in their practices of the production of space during socialism. Furthermore, it is not uncommon for 'old age', which has since become a dominant facet of their identities, to have altered their everyday practices and strategies. Highlighting another example of fluidity and temporality: shifts between 'blendedness into' and 'resistance' within or against the process of gentrification are often influenced by changes in an individual's gender-dependent position within the household. By placing our integrated approach within the perspective of the production of scale, we align ourselves with those who argue that the household (the home) and the body are integral parts of the fluid and dynamic process of the production of space. Consequently, these scales play a crucial role in the study of spatial differentiation and inequalities (Smith, N. 1992b; Marston, S. and Smith, N. 2001).

Finally, it cannot be overemphasised that, alongside differentiation, the interests of capital do not cease to push the diversity of workers identified here towards equalisation (see, for instance, the expansion of the reserve army of displacement at the expense of homeowners). There is no reason to assume that specific urban structures, such as detached housing character, can permanently prevent the abstract space of capital and the state, in its drive toward homogenisation, from colonising everyday life and concrete space (Lefebvre, H. 1991 [1974]). Indeed, this has already been substantiated by empirical research into gentrification driven by the alliance of state and capital in other major Hungarian cities (Timár, J. 2019). In the neighbourhoods examined here, the existing built form may hinder this process; however, a shift in municipal policy in Pécs or the territorial demands of newly arrived large-scale capital in Debrecen (Nagy, E. *et al.* 2026) could easily trigger a dispossession and 'takeover' in peripheral areas, specific streets, or around municipal housing.

The question remains: to what extent do the specific characteristics of the studied spaces and their gentrification contribute to the absence of collective resistance to the process? Our findings regarding individual and household-level everyday practices, however, suggest that no matter how differentiated the group of workers may be, the working-class social position itself constitutes a common denominator, leaving them ill-equipped to organise community resistance against collective capital.

However, it must be acknowledged that exploring everyday life through in-depth interviews entails certain methodological limitations, without which an even broader repertoire of lived experiences and practices could have been uncovered. While urban spaces characterised by detached family housing are not the conventional sites of classical gentrification, their study may facilitate the search for parallels with small- or medium-town and/or rural gentrification (e.g. Nagy, E. and Timár, J. 2012; Holm, A. *et al*. 2015; Jámbor, V.E. and Vedrédi, K. 2016; Tomay, K. and Berger, V. 2024); furthermore, it provides an opportunity to identify additional CEE specificities. Beyond these points, the integrated approach applied here may open a new platform within international scholarly discourses on gentrification and uneven development.

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Sometimes up, sometimes down on the seesaw: Experiencing industrial investment and disinvestment in Budapest's Ganz-MÁVAG manufacturing site

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Abstract

Drawing on Neil Smith's "seesaw" metaphor of uneven development, this paper examines how historical cycles of industrial investment and disinvestment were/are lived, experienced, and narrated in Budapest's former Ganz-MÁVAG manufacturing site. Methodologically, we combine extensive document analysis and qualitative interviewing, including non-conventional interview formats. Empirically, the findings show that "up" and "down" positions on capital's seesaw were experienced in highly ambivalent and differentiated ways: socialist-era "being up" could be narrated simultaneously as security and pride, but also as constraint and frustration, while post-socialist "being down" unfolded as an affectively intense rupture, often entailing not only job loss but the withdrawal of paternalistic care, community life, and local infrastructures. The subsequent "up again" trajectory was brought about by reinvestment through trade/logistics, although frequently framed through cultural distance and ethnicised boundary-making. Overall, we conclude that Smith's seesaw is not merely a political-economic model but a heuristic for tracing how uneven development becomes classed, ethnicised, and spatialised in everyday life – and that the form of reinvestment matters at least as much as its magnitude.

Keywords: uneven development, seesaw, everyday life, lived experiences, industry, deindustrialisation, Budapest

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Introduction

„*Egyszer fenn, máskor lenn*" – goes a Hungarian saying, the approximate English interpretation of which is "*Ups and downs*", or "*Sometimes you're up, sometimes you're down*". Most sources explaining the saying explicitly mention the children's playground game of the seesaw (teeter-totter), arguing that this "sometimes up, sometimes down" oscillation is precisely like alternately being up and down while playing on a seesaw. Since Neil Smith also used the notion of the seesaw as part of his concept of uneven development, already from the early 1980s onwards (Smith, N. 1982, 1984), it seemed an evident point of departure for us to apply it.

It is also important to emphasise that in the Hungarian language the idiom „*Egyszer fenn, máskor lenn*" can be used in a *personal*, *emotional* sense (i.e. sometimes we are in a better mood, at other times in a worse one), but it can also be used in relation to *larger scales* and to *development* (e.g. when the economy of the

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country in a given period is on an upward trajectory, developing, while in another period it is on a downward path, in a time of crisis). The saying itself (as a kind of "everyday wisdom") is therefore, on the one hand, a scale-independent linguistic formula, and on the other hand, it can designate both a structural position and a subjective experience. Since the aim of the present thematic block is to interweave uneven development and everyday life, we argue that Neil Smith's seesaw and its "sometimes up, sometimes down" positions serve as a perfect metaphor for us.

The Hungarian case studies published in the present issue that connect uneven development and everyday life deal with the lived experiences of historical investment–disinvestment cycles – first, in urban *residential areas* (Timár, J. and Trócsányi, A. 2026), second, in rural *agrarian areas* (Mihály, M. and Fabula, Sz. 2026), and third, in our paper, in an urban *industrial area*. In this article, we examine how those living in the vicinity of a large industrial facility live(d) through and experience(d) investment–disinvestment, and development–underdevelopment cycles (i.e. being "up" and "down" on capital's seesaw), in both the socialist era and the post-socialist period. We do so through the example of Budapest's former Ganz-MÁVAG manufacturing site, in order to highlight that the personal and group-level experiences of "up" and "down" positions are profoundly relative. In this relational approach, then, it matters greatly whether our seesaw (to further develop the metaphorical image) is located in a lively socialist-era playground or a dilapidated post-socialist-era playground. We argue that the most important novelty and theoretical contribution of our study lies in placing Smith's seesaw metaphor at the centre, thoroughly thinking it through, and demonstrating its relational character.

The structure of the paper is as follows. First, in our literature review, we provide an overview of that segment of the otherwise exceptionally broad and diverse uneven development literature which reflects specifically on Neil Smith's seesaw metaphor, followed by the identification of a research gap concerning the everyday experiences of investment–disinvestment, development–underdevelopment cycles in the case of industrial and/or deindustrialising milieux. After that, we outline the brief historical background of our case study, with particular attention to the temporal dynamics of investment–disinvestment–reinvestment cycles across political regimes, and then we describe the methodology of our empirical research. We then present our findings and, in a relationally sensitive manner, shed light on the most important characteristics of the socialist and the post-socialist era. Finally, we summarise the most important outcomes of the research.

Theoretical framework – "Sometimes up, sometimes down" on capital's seesaw

Providing a comprehensive overview of the entire academic discourse on uneven development (and, even more so, on the broader field of uneven and combined development) is, of course, an impossible task. Given the vastness of the field, we focus only on works that explicitly engage with Neil Smith's seesaw metaphor.

In the very first pioneering works of the Scottish Marxist geographer (Smith, N. 1979a, b), the metaphor does not yet appear – however, it emerges shortly thereafter, in the first half of the 1980s (Smith, N. 1982, 1984). For the very first time, it appears in a 1982 article, at the very end of the paper, almost in passing: "*The logic behind uneven development is that the development of one area creates barriers to further development, thus, leading to underdevelopment, and that the underdevelopment of that area creates opportunities for a new phase of development. Geographically, this leads to the possibility of what we might call a "locational seesaw": the successive development, underdevelopment, and redevelopment of given areas as capital jumps from one place to another, then back again, both creating and*

destroying its own opportunities for development." (Smith, N. 1982, 151). (Immediately afterwards, in the very next sentence, he also uses "*seesawing*" as a verb when discussing supranational, regional, and urban scales.) Subsequently, in his groundbreaking book "*Uneven Development: Nature, Capital and the Production of Space*" (Smith, N. 1984), he elaborates the concept in much greater detail, devoting an entire (sub)chapter to the seesaw metaphor under the title "*A Seesaw Theory of Uneven Development*". Here, Smith conceptualises uneven development as a dynamic seesaw movement of capital, whereby capital systematically shifts between developed and underdeveloped spaces in search of higher rates of profit, producing cyclical patterns of investment, devaluation, and reinvestment across spatial scales. In his view, this movement is most fully realised at the urban scale, where capital's relative mobility enables rapid alternations between development and underdevelopment, while greater spatial rigidities at national and international scales impose limits on the extent to which the geographical seesaw can operate (Smith, N. 1984). From this point onwards, the concept is used routinely (by Smith himself and by many others as well), in line with the above, primarily at the urban scale. For this very reason, it is particularly noteworthy that in his 1996 book on gentrification entitled "*The New Urban Frontier: Gentrification and the Revanchist City*", Smith briefly mentions that seesawing should also be thought through in a global context (Smith, N. 1996, 88–89).

Over time, the metaphor has become so widely accepted and broadly applied (Bok, R. 2018, 1089) that in most works where it appears, authors tend to invoke it almost "by default", in a self-evident manner, without any more detailed elaboration. We find relatively few works that move beyond this taken-for-granted interpretation and engage more deeply with the meaning(s) of the seesaw metaphor and its potential analytical possibilities. One of the stimulating exceptions is Neil Brenner, who, in the context of the broad and thought-provoking "scale debate", drew attention to how much the concept of the seesaw might help us to understand geographical scales, as well as multi- and trans-scalarity (Brenner, N. 2010). This scalar sensitivity is particularly relevant in the Central and Eastern European context as well, as another contribution to this thematic block demonstrates through its analysis of seesaw-like fluctuations and the simultaneous operation of convergence and divergence across geographical scales (see Tagai, G. and Kronstein, B. 2026). Furthermore, there are also (counter)examples that explicitly rely on the seesaw metaphor across a range of scales, from the very local to the very global. On the local scale, Jess Steele's book (2018) chapter presents "self-renovating neighbourhoods" as alternatives to both gentrification and decline: she uses Smith's original "locational seesaw" metaphor when challenging the notion that there is no alternative to participating in the cycle of uneven capitalist development. On the global scale, in a recent paper sociologist Roberto J. Ortiz (2024) provides a global-context application, focusing on how capital's capacity to "seesaw" from place to place in search of higher profits contributes to unevenness and triggers spatial competition between locations. He argues that Smith's seesaw theory of uneven development, when viewed in an ecological and global context, can help account for major trends in capitalist globalisation over the past few decades, such as the relocation of manufacturing and competition for mobile capital. He illustrates this argument with brief empirical examples as well, e.g. pollution havens and Special Economic Zones (SEZs), demonstrating capital's seesaw at work in global manufacturing and how states respond to this dynamic. This latter (quite recent) article fits excellently into the endeavour already articulated by Smith himself in the mid-1990s – namely, that it would be important to think through the possibilities inherent in the seesaw concept at the global scale as well (see Smith, N. 1996, 88–89).

Alongside these more "conventional" applications, Smith's seesaw metaphor has been mobilised in surprisingly diverse fields as

well – such as in mobility/transport studies, literary studies, or anthropology. From the field of mobility/transport studies, Groth, S. *et al.* (2025) build explicitly on Smith's notion of the "seesaw movement of capital": the authors conceptualise the market-based rollout of e-scooter services as a cyclical process of spatial expansion, saturation, withdrawal, and selective re-entry, through which capital oscillates between profitable and unprofitable locations. In this reading, the seesaw captures how attempts at spatial equalisation through mobility innovation are continually frustrated by differentiation, producing rapidly shifting geographies of provision and bypass that are most pronounced at the urban scale. Highlighting policy implications, they conclude that without developing alternatives to market-related "seesaw movements", significant progress toward a comprehensive socio-ecological transformation through new mobility services cannot be assumed. Perhaps even less expectedly, in the field of literary studies, the metaphor has been applied to colonial Korean poetry by Kevin M. Smith (2019). He used the concept to analyse the uneven development of the Korean colony, particularly the contradiction between town and country, suggesting that unevenness constituted the material basis for linguistic experimentation in Korean literature. He related the seesaw to literature by discussing how the production of modernist literature was connected to the uneven development of capital and Neil Smith's seesaw metaphor. From the field of anthropology, Kasmir, S. *et al.* (2018) draw on Smith's seesaw-like movements between investment, disinvestment, and devaluation: they reconceptualise unevenness anthropologically as a politically charged process produced through struggles between labour, capital, and the state, rather than as a purely structural outcome of capitalist dynamics. By placing ethnographic attention on how these seesaw movements are lived, contested, and reworked in everyday labour relations across disparate sites, their article demonstrates the analytical power of the seesaw concept, showing how uneven development becomes an embodied, relational, and historically contingent condition within anthropology. While these studies demonstrate the broad applicability of the seesaw metaphor across mobility/transport studies, literary studies, and anthropology, our contribution lies in mobilising it specifically to connect the political-economic dynamics of industrial investment, disinvestment, and reinvestment with their subjective, emotional, and everyday lived experiences in a deindustrialising urban milieu.

Smith's seesaw concept has, of course, also been subject to criticism over the decades. On the one hand, it has been pointed out that seesaw-like up-and-down movements can only be interpreted in a limited way in societies and countries where capitalist and non-capitalist relations coexist simultaneously (e.g. in the case of South Africa and Zimbabwe, as demonstrated by Bond, P. and Ruiters, G. 2017). On the other hand, even if we remain within the capitalist logic, it is essential to emphasise that already in the 1990s Mick Dunford drew attention to the fact that in reality positions are never manifested simply as "only up" or "only down" in the same way for everyone; rather, a simultaneous coexistence of the two can often be observed (Dunford, M. 1993, 1996; Dunford, M. and Smith, A. 2000; see also in Smith, A. 1998; Timár, J. 2007). In our case study, we likewise seek to remain attentive to the extraordinary complexity of investment and disinvestment dynamics – however, we primarily use the seesaw *as a metaphor*, and aim to exploit the analytical potential inherent in it. We do so all the more because the concept is one of human geography's most powerful metaphors: according to Bok, R. (2019), Neil Smith's (1984) seesaw of uneven development is unquestionably one of human geography's "big" metaphors (Bok, R. 2019, 1089–1090). On this basis, we argue that the seesaw is not only an extremely powerful metaphor, but that being "sometimes up, sometimes down" on the seesaw also offers an excellent opportunity to connect structural positions with their subjective and emotional lived experiences.

As the aim of the present thematic block is to bring together the perspectives of uneven development and everyday life, it is important to emphasise that relatively few empirical studies have systematically examined how cycles of investment and disinvestment are experienced and narrated in everyday life. Beside a few genuinely noteworthy counterexamples (see in Timár, J. and Trócsányi, A. 2026), however, we find virtually no works that explicitly thematise the everyday lived experience and personal perception of investment and disinvestment, development and underdevelopment cycles in the case of *industrial* and/or *deindustrialising milieux*. Hence, in addition to the theoretical mobilisation of the seesaw metaphor, our work seeks to respond to this empirical research gap as well. In what follows, we review the investment–disinvestment–reinvestment histories of our case study, focusing explicitly on the seesaw's "up" and "down" positions of economic development – this "structuralist" foundation will then serve as the basis for the empirical section, where the key question will be how former workers and local residents lived through these economic cycles, the experience of being "sometimes up" and "sometimes down".

A brief historical overview of investment, disinvestment, and reinvestment in the case study area

Our case study area is the so-called Ganz-MÁVAG site, located in Budapest, Hungary's capital and primary metropolitan centre. The site lies on the outer edge of the capital's District VIII, at the boundary between the inner city and the historically industrial, later heavily deindustrialised District X, a Chicago School-style "transitional zone" of the metropolitan fabric. The early (capitalist) and postwar (socialist) periods of the Ganz-MÁVAG manufacturing site have been discussed in numerous works on industrial history and local history (e.g. Jász, M. 1964; Suba, G. 1987; Pilinyi, P. 1999; Abelovszky, T. 2010), while the more recent developments can be reconstructed particularly well on the basis of press coverage dealing with the transformation of the area (along with the overview of Chuang, Y-H. 2020). In this section, we draw on these sources to outline the dynamics of investment, disinvestment, and reinvestment *(Figure 1).* Since our period of analysis spans different political-economic regimes, we use the terms investment, disinvestment, and reinvestment in a historically sensitive manner: in the socialist period, "investment" re-

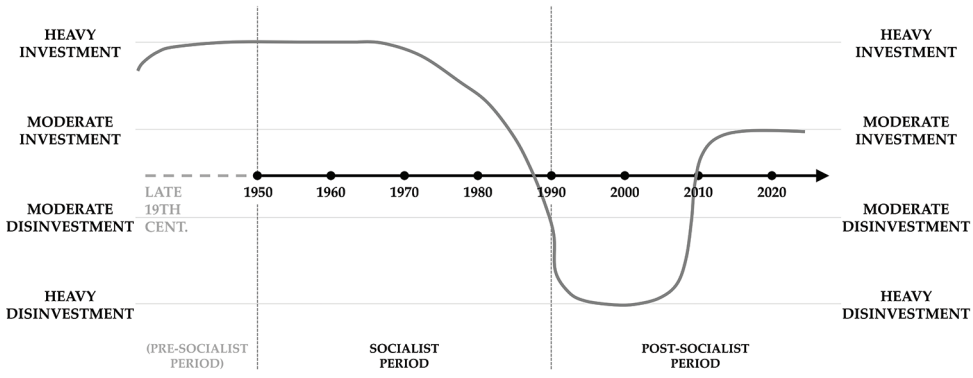

Fig. 1. Cycles of investment and disinvestment in the case of the Ganz-MÁVAG site, Budapest.
Source: Authors' own elaboration.

ferred primarily to state-mediated allocation of fixed capital, labour, infrastructure, and productive capacity, whereas post-socialist disinvestment and later reinvestment were increasingly shaped by privatisation, market devaluation, and private or transnational capital flows.

The history of industrial investment in the area began in the last quarter of the 19th century, in the years following the establishment of the Austro-Hungarian Monarchy. Among the many local predecessor firms of what later became the Ganz-MÁVAG industrial conglomerate, the MÁV Gépgyár (MÁV Machine Factory), specialising in the production of steam locomotives and railway carriages, was founded in 1870 (it produced its very first locomotive in 1873, the year in which Buda and Pest were unified), while the local branch of the company founded by the Swiss-born Ábrahám Ganz began production in 1880 (also manufacturing railway rolling stock). During the first half of the 20th century, the two companies developed in parallel and at a rapid pace – in 1925 the MÁV Machine Factory had become MÁVAG, while Ganz, around the same time, began producing diesel railcars. At the beginning of the socialist period, these companies did not escape nationalisation either, which took place here in 1948. By the 1950s, MÁVAG's profile included the production of locomotives, the manufacture of machinery (pumps, compressors, etc.), as well as bridges, cranes, and other steel structures, while Ganz continued to focus on railway rolling stock (railcars, multiple units, and diesel engines), along with water machinery. The similarity of the two companies' production programmes, their multiple interdependencies (e.g. their cooperation in dieselisation), and their spatial interconnectedness all made their merger appear justified. As a result of the unification – finally realised in 1959 – the enormous Ganz-MÁVAG complex was created, which, with its 20,000 employees and more than 300 buildings spread across a 42-hectare site, became Hungary's second-largest industrial complex at the time.

Accordingly, the first decades of the socialist period (the 1950s and 1960s) were characterised by heavy investment, during which production served both domestic demand and a strong export orientation. The 1970s, however, began to bring changes – the plant, which had been genuinely world-class and internationally renowned in the first half of the 20th century, had by then "settled into" the socialist economy; unlike under earlier capitalist conditions, competition diminished, and with it innovation as well (since products of virtually any quality could be readily sold on the COMECON market). From the mid-1970s onwards, therefore, even though the factory formally continued to operate at high capacity, it is more appropriate to speak of a period characterised by slowing momentum, declining innovation, and decreasing competitiveness. (This was not yet the "collapse", but it was no longer the "golden age" either.) Subsequently, the 1980s were marked by pronounced slowdown and structural problems – due to a lack of orders and mounting debt, Ganz-MÁVAG ultimately ceased to exist in 1988 (i.e. before the collapse of the state-socialist system), and through privatisation-related restructuring it was dismantled into nearly 40 successor companies. After that, the 1990s were characterised by fragmentation (as a result of further privatisation) and industrial retreat (due to severe deindustrialisation), and the area became a typical brownfield site.

Since the industrial function remained weak throughout the 2000s as well, Chinese traders operating nearby gradually began to "seep into" the brownfield area, making use of the abundant vacant spaces available there (which were also characterised by extremely low rental prices). This became a key moment in terms of the "afterlife" of the area's devalued industrial landscape. While in the 2000s Chinese traders primarily used the emptied industrial halls for storage and wholesale purposes, from the 2010s onwards they increasingly did so for retail activities as well. This already constituted a form of capital (re)investment, as part of which, alongside

the predominantly Chinese traders operating in the area, Vietnamese, Turkish, Afghan, and other merchants also established themselves. From this period dates a gradually intensifying attention directed toward the site, as increasing numbers of people began to "venture" into the previously unknown, derelict brownfield area through alternative tourism agencies' thematic urban walks, gastronomic programmes, etc. At the beginning of the 2020s, the COVID lockdown affected this area as well; following this period, however, the processes that had taken shape during the 2010s continued – Chinese traders have been renovating more and more buildings, an ever wider range of services has appeared in the area, and growing tourist interest has accompanied what is now known to many simply as the "Budapest Chinatown".

To sum up the seesaw of uneven development, "investment" here referred to the industrial complex's productive-industrial trajectory up to the mature socialist period. After the first signs of crisis and the subsequent industrial dismantling, a massive disinvestment phase was/is followed by the site's post-industrial revalorisation via non-productive, trade- and service-oriented forms of capital reinvestment. This is consistent with Smith's emphasis on investment/disinvestment as movements of capital that can re-enter a devalued landscape in radically new forms – in this case, into a brownfield area in the form of a Chinese/Asian market, i.e. the involvement of the international scale.

Methodology

In our research, we sought to be innovative not only through the theoretical mobilisation of Smith's seesaw metaphor, but also in the choice and combination of our research methods. In order to be able to capture the everyday experiences of the cycles of uneven development (i.e. the "up" and "down" positions of the seesaw) in our case study area, we sought to mobilise a combination of conventional and non-conventional research methods.

Regarding conventional ones, we conducted an extensive document analysis drawing on works of local history, the Arcanum database, a systematic review of the local newspaper *Józsefváros Újság* (Józsefváros Newspaper), as well as internet forums and open Facebook groups – the *Otthonunk Józsefváros* (Our Home, Józsefváros) public Facebook group, the *Józsefvárosi Piac* (Józsefváros Market) public Facebook group, and online articles dealing with the area published on *origo.hu*, *index.hu*, and *welovebudapest.com*. Within these sources, we specifically searched for residents' opinions related to the case study area, their past or present lived experiences, and their subjective evaluations of local change. We tried to approach the textual excerpts extracted from these materials in a highly reflexive manner. For the analysis of the local discourses emerging from these documents, we primarily drew on the work of Foucault, M. (1972), Entman, R.M. (1993), and Wodak, R. (2001). Foucault's "archaeology of knowledge" helps us to establish connections between discourse and power, and to identify who shapes dominant narratives (e.g. authorities' vs. residents' discourses). Robert M. Entman's "framing" enables us to categorise narratives as positive or negative ones and to trace their temporal shifts and changing dominance over time, while Ruth Wodak's Discourse-Historical Approach (DHA) is also particularly useful for the context-sensitive chronological analysis of discourses. In this sense, "framing" also functions as a methodological bridge between the political-economic abstraction of the seesaw and everyday experience: it allows us to analyse how structural positions of investment, disinvestment, and reinvestment are translated into emotionally charged local narratives of security, loss, resentment, or renewed opportunity, in line with recent work emphasising the role of emotions in regional development trajectories (such as Hannemann, M. *et al.* 2024).

The analysis of secondary sources was complemented by interviews, including both conventional and non-conventional formats. Our interview partners included a former Ganz-MÁVAG factory worker, a long-term

nearby resident, an industrial historian, a representative of the district municipality, a member of the district's Urban Development Committee, the condominium representative of the housing estate adjacent to the case study area, two security guards working on the Ganz-MÁVAG site, and a scholar conducting research on Chinese investments in Budapest. With regard to the interviews, it should also be noted that the seesaw metaphor was not initially intended to serve as the central motif of the paper either, but rather emerged inductively from the interviews. As several interview partners independently used the expression "*sometimes up, sometimes down*" when referring to their own lives or to the fate of their neighbourhood (without any prompting on our part), we felt that Smith's seesaw metaphor could provide a particularly apt and evocative analytical framework for interpreting these narratives.

It is also important to underscore that, wherever the opportunity arose, we conducted not only conventional (seated) interviews but also mobilised non-conventional interview methods – including a museum interview, several informal conversations, and go-along interviews. The museum interview was conducted in the Ganz Collection, where the exhibition's curator (an industrial historian who had previously also worked for Ganz-MÁVAG) reflected on the changing history of the factory and its broader neighbourhood through the exhibited objects. Given the specificities of the Ganz-MÁVAG brownfield site, security guards working at the vast Chinese market were also approached, in an informal manner. As Swain, J. and King, B. (2022) argue, informal conversations can serve as a valuable qualitative method not only as part of ethnographic research but also on their own, and in some contexts may represent the only feasible way of generating data. For us, however, the most important and analytically productive encounters were the go-along/mobile interviews (Carpiano, R.M. 2009; Finlay, J.M. and Bowman, J.A. 2016). This method offers several advantages. Carpiano suggests that go-along interviews generate types of data that differ qualitatively from those produced in conventional seated ones, as moving through the research setting foregrounds place-based, contextual, and often tacit meanings that tend to remain hidden, abstracted, or distorted in stationary (e.g. office- or café-based) interview situations. His central claim is that the go-along interview anchors participants' narratives in immediate sensory and social encounters with their environments, thereby shifting data production from retrospective recall toward in situ experience. As a result, interview partners not only talk about different issues, but do so in different sequences and with greater spatial specificity, as physical surroundings actively prompt memories, evaluations, and affective responses. Importantly, Finlay, J.M. and Bowman, J.A. (2016) also emphasise that during mobile interviews participants do not merely describe places, but actively demonstrate their experiences of them. Finally, it should be noted that our engagement with the research site was not limited to the duration of the go-along/mobile interviews – over the past several years we also spent considerable time walking through the area, seeking to internalise the "*walking as method*" approach as a broader research sensibility (Pierce, J. and Lawhon, M. 2015; O'Neill, M. and Roberts, B. 2020).

Findings

As the historical overview has already shown, at the beginning of our period of investigation, in the early phase of state socialism, the factory was clearly "up" on capital's seesaw – yet its everyday experience was far more ambivalent. Those who ideologically identified with the new regime welcomed nationalisation and evaluated the first half of the 1950s in unequivocally positive terms. In a factory employing such a large workforce, however, it was inevitable that many experienced this economically still expanding period in very different ways. They not only viewed the 1948 nationalisation with scepticism, but

also lived through the 1956 revolution as an intense emotional rollercoaster; while during the days of the revolution party officials were removed, workers' councils were established, and shop-floor self-organisation was experienced as an "upward tilt" of autonomy and as a manifestation of collective agency, the reprisals following the suppression of the revolution plunged many into apathy. Thus, within the same plant, in the same micro-space, radically different lived experiences emerged within the span of just a few months – a pattern that unfolded in a similar manner across other parts of the country at the time.

The next major turning point after the revolution was the 1959 merger of Ganz and MÁVAG, the reception of which was similarly marked by ambivalence in workers' perceptions. Both the top and bottom of the institutional hierarchy tended to welcome the decision: for the factory's managerial elite the merger represented a "necessary and successful rationalisation", while manual workers and their families, internalising the logic of "bigger factory → higher prestige → more stable future", also largely greeted it with approval. The intermediate ("middle") layers, however, were far less satisfied; while they were evidently unable to voice their criticisms publicly at the time, later recollections reveal that many experienced the merger negatively due to the growing administrative burdens it entailed and the difficulty of reconciling the two firms' corporate cultures in the early 1960s. (Whereas Ganz had traditionally been more precise and export- and innovation-oriented, MÁVAG had long been structured around large series and heavy-industrial volume production.)

From the perspective of everyday lived experience, perhaps even more significant was the "integrated life-world" represented by the workers' housing estate directly adjacent to the factory, the so-called *Kolónia* (Colony) – which provides a further illustration of these ambivalences. Built in the early 20th century (in 1908–1909), i.e. in the pre-socialist period, the estate was originally indeed an exceptional example of infrastructural care and "industrial paternalism", however, under state socialism this began to change. Following nationalisation, the estate was transferred to the ownership of *Ingatlankezelő Vállalat* (IKV), the state-owned municipal housing and property management company responsible for the allocation, maintenance, and administration of publicly owned residential buildings and commercial premises. According to recollections, vacant flats of the *Kolónia* were increasingly allocated to "outsiders" (many of whom regarded the estate merely as temporary accommodation), janitorial positions disappeared, and community cohesion gradually eroded. While many factory workers still considered it a great privilege to live in the factory's housing estate, growing numbers began to feel that the formerly cohesive, family-like atmosphere and good-neighbourly relations were being replaced by alienation and indifference.

As it was also shown in the historical overview, following its "up" position the factory entered a gradual downward trajectory from the 1970s onwards, primarily due to the lack of market competition and innovation (as system-specific characteristics of state socialism). Since wages at the factory continued to provide a secure livelihood, this "downward" tendency was initially perceptible mainly to the engineering staff (generating professional frustration), before gradually becoming evident to the core group of skilled workers as well. It is also important to note that this period coincided with the peak of socialist housing estate construction and for that, with a large-scale Roma migration to Budapest as well – particularly to districts VIII and X, at whose boundary the Ganz-MÁVAG site is located. Because the company predominantly relied on a medium- to highly qualified industrial workforce, Roma workers were not present in large numbers at the site, although they were by no means entirely absent – a telling example is that of (later) Roma writer and public intellectual Béla Osztojkán, who was born and raised in Northern Hungary and, after moving to Budapest during this period, found employ-

ment at Ganz-MÁVAG as a turner and milling machine operator. This is particularly revealing because while most workers experienced the factory's stagnation and "descent" in the 1970s and '80s as a decline, for Roma people moving to districts VIII and X from Northern Hungary this position represented an improvement relative to the milieux they had left behind. That they did not experience their position as a "decline" (like the majority of non-Roma workers) but rather as a form of "upward mobility", vividly illustrates the variegated everyday experiences of uneven development's macro-structural cycles.

It is nevertheless important to underscore that, despite all these ambivalences, there was broad consensus that employment at the factory provided material security throughout the entire state socialist period. This is perhaps best illustrated by the fact that a skilled worker (such as a turner, fitter, or welder) often earned more than an average white-collar employee and not infrequently approached or even matched the income of a lower-ranking engineer. (What is more, even the salaries of managers, chief engineers, and directors only moderately exceeded those of engineers.) All of this changed fundamentally from the late 1980s onwards. It is important to distinguish here between the broader experiential effects of the regime change and those of the site-specific transformation of Ganz-MÁVAG: while the former produced generalised uncertainty through the collapse of socialist-era employment security, welfare expectations, and familiar institutional frameworks, the latter was lived more locally through the disappearance of factory routines, the fragmentation of workplace communities, the decline of the *Kolónia*, and the stigmatisation of the emerging brownfield landscape.

As we have seen, the factory collapsed before the political system itself – several interlocutors remarked that for Ganz-MÁVAG workers, 1988 was what for the country 1989 was. From the early 1990s, most of the site became a classic brownfield: and since the former routine daily rhythms of factory life disappeared, the related personal experiences largely vanished as well. In our interviews about this period (and in textual sources), Robert M. Entman's (1993) negative framing clearly dominated, with strong rhetorical pathologisation and stigmatisation of abandoned industrial areas (see Armstrong, C.S. 2007), portraying brownfields as "scars in the urban fabric". The adjacent *Kolónia* workers' housing estate, however, continued to generate lived experiences. As noted above, the social fabric characteristic of the first half of the 20th century had already begun to unravel by the mid-socialist period, reaching a distinctive low point after the regime change. Deindustrialisation rendered thousands of former factory workers unemployed, many of whom sought work elsewhere; their places were increasingly taken by low-status populations able to afford only the low rents of the now heavily stigmatised neighbourhood. The formerly cohesive community of the *Kolónia* fractured into ageing long-term residents (largely retired former factory workers and their spouses, widows of ex-workers) and lower-status newcomers settling in the area on a temporary basis. By the 1990s, most former community spaces had also disappeared or been radically transformed (as in the case of the infamous *Fekete Lyuk* [Black Hole] underground punk/alternative club), while the neighbourhood became increasingly neglected, dirty, and rundown.

While the case study area was subjected to Smithian heavy disinvestment throughout the 1990s and 2000s, an intriguing spatial movement began from the direction of the neighbouring so-called "Four Tigers" Chinese market after the turn of the millennium. For Chinese traders operating in the market – which opened in 1993 and became partly notorious for illegal activities – the deindustrialisation of the Ganz-MÁVAG complex proved highly advantageous, as it offered vast spaces for storage and wholesale logistics at extremely low rents. Personal accounts from the late 1990s depict two entirely separate worlds coexisting side by side: remnants of declining industry, where small workshops and their industrial workers struggled for survival,

and, directly around them, Chinese traders – including criminals fleeing prosecution or political dissidents from China – selling lace underwear, producing a profoundly surreal spatial experience. According to the few remaining industrial workers, the Chinese were "practically unapproachable", living in closed communities by their own internal rules. As their presence and activities were often illegal during this transitional period, even conflicts arose with factory workers or random passers-by who inadvertently witnessed illicit practices. This ethnicised everyday boundary-making generated widespread feelings of insecurity and risk associated with the area in the 1990s. (This is particularly striking given that, whereas the factory had symbolised security and predictability during socialism due to relatively good wages, in the 1990s and 2000s the site came to represent risk and uncertainty.) While Chinese traders filtered into the area during the 2000s only slowly, the complete closure and demolition of the "Four Tigers" market in 2013–2014 triggered a full relocation of activities to the former Ganz-MÁVAG site, now increasingly including retail functions alongside storage and wholesale trade. After a liminal period of roughly two decades, this marked the beginning of the area's "second life", transforming the former city-within-the-city industrial giant into "Budapest's Chinatown" – a shift in which lived experience clearly became inseparable from the attitudes towards Chinese traders and their activities.

Following the loss of their former "own space" (the "Four Tigers"), traders began reshaping the Ganz-MÁVAG site in their own image, especially through façade repainting fitting general Chinese aesthetics, Chinese (as well as Vietnamese, Arabic, etc.) signage, and building extensions – processes that constituted capital reinvestment. These striking material and symbolic transformations attracted increasing attention towards this strange hybrid world, prompting growing numbers of people to "venture into" the area. As more and more individuals acquired personal experience of the site, it elicited highly divergent emotional responses depending on habitus. Whereas an unequivocally negative framing (Entman, R.M. 1993) dominated the late 1990s and 2000s, neutral and gradually even positive framing began to emerge from the 2010s onwards. In both the sources analysed and interview narratives, metaphors such as "*parallel world*", "*ethnic economy*", and "*cultural island*" were prominent – all emphasising cultural distance and invisibility, symbolic estrangement, and spatial detachment ("*they are here, but not with us*", "*they don't want contact with us*", "*the whole neighbourhood feels unfamiliar*"). Additionally, many articulated concerns around "*crime/uncontrolled trade*" (black economy), "*disorder and law-enforcement problems*", and complaints that the Chinese are "*rather noisy*", "*spoiling the cityscape*", and as a result of illegal waste dumping, turning the site into "*a dirty, smelly, disorderly area*".

Since the mid-2010s, however, more neutral or even positive framing has also emerged – and interestingly, driven less by authorities than by nearby residents (see Foucault, M. 1972). More and more people started to realise that "*the market has a good supply*" (of "*cheap goods*"), it is "*worth going in for bulk purchases*" and, since the broader neighbourhood (the edge of districts VIII and X) is still one of the poorest areas of Budapest, "*it is a part of the local social safety net*". Indeed, the cheap Chinese/Asian market supports food and clothing consumption among low-status local populations – which also helps explain why authorities often turn a blind eye to its otherwise semi-legal or illegal practices. Even later, over the past few years, niche tourism emerged as well (in the form of alternative tourism firms' thematic urban walks, gastronomic programmes, etc.), portraying the Ganz-MÁVAG site as "*a truly fascinating area*", "*a hidden gem*" of the Hungarian capital. Despite these scattered positive accounts, however, opinions still remain highly ambivalent – from an average middle-class perspective, the area is still not considered attractive, and many continue to view it as risky and danger-

ous, a perception also reinforced by our informal conversations with security guards during fieldwork. (Not only is the market itself ethnically diverse with its Chinese, Vietnamese, Georgian, Armenian, Bosnian, Arab, Romanian, Serbian, Ukrainian, Slovak, Slovenian, Croatian, Turkish, Afghan, etc. traders, but security provision also follows a distinctive logic, with certain sections guarded by Bosnians, certain sections by Serbians, etc.) Of course the Chinese (and other) traders themselves also form a highly polarised community (ranging from individuals driving the most expensive luxury cars to those using battered bicycles or tuk-tuks), which would merit a separate analysis. Overall, the site is currently perceived by many as a both repulsively run-down and enticingly exciting space at the same time.

Finally, parallel to these developments in the Chinatown-turned Ganz-MÁVAG area, in the former workers' housing estate *Kolónia* gentrification started to unfold during the 2010s – and, as in other gentrifying milieux, these processes generate deeply ambivalent lived experiences. Retired former factory workers and their wives, who during the factory's operation occupied an upward position on the "emotional seesaw" (feeling at home in the area), increasingly no longer experience the neighbourhood as their own, while younger, highly educated "gentries" have moved in precisely because this has become one of Budapest's most interestingly transforming (and still affordable) hoods – paradoxically, largely due to those Chinese traders and their market that long-term residents see as having irreversibly ruined their environment.

Discussion

Following the presentation of our case study, this section highlights the most important takeaways of the Ganz-MÁVAG site's twisty story, focusing on (i) its multi-scalar spatial embeddedness, (ii) its ethnically differentiated lived experiences of uneven development, (iii) its post-crisis reinvestment, (iv) the temporal dynamics of framing, and (v) the relational nature of the "up" and "down" positions on capital's seesaw.

(i) With a scalar sensitivity, important differences emerge across several scales: at the *urban scale*, the Ganz-MÁVAG site is located on the inner edge of Budapest's former industrial zone, close to the city centre; at the *regional scale*, it is embedded in Hungary's most prosperous region; at the *national scale*, it was strongly promoted by the socialist state before being effectively abandoned in the late 1980s; and regarding the *transnational scale*, it has been shaped by international (Chinese, Vietnamese, Turkish, Afghan, etc.) capital, in the form of myriads of small-scale (micro)investments. This also means that the seesaw movement examined here did not unfold through a single, continuous form of capital: rather, socialist state investment, post-socialist privatisation-related devaluation, and later private, small-scale, ethnically embedded reinvestment constituted historically distinct but sequentially connected moments in the same local trajectory of uneven development.

(ii) The case study vividly illustrates that uneven development is lived in ethnically differentiated ways as well. In the Ganz-MÁVAG factory, Roma workers often experienced employment there as a form of relative uplift in/by the metropolitan industry. Thus, racialised experiences further complicate the seesaw metaphor: what was perceived as decline or loss by many non-Roma Hungarian workers could simultaneously be experienced as improvement or opportunity by Roma workers or by economically marginalised Chinese traders. These findings empirically reinforce the claim that the seesaw of uneven development is not only classed, but also racialised/ethnicised.

(iii) Turning to the post-crisis period, the reinvestment trajectory that followed the low point should not only be theorised economically but also symbolically. At the Ganz-MÁVAG site, capital returned primarily in the form of wholesale, retail, and logistics ac-

tivities, producing strong experiences of cultural distance, symbolic estrangement, and ethnicised framing. This underscores that the form of reinvestment matters at least as much as the fact of simply moving "upwards again" on the economic seesaw.

(iv) Relatedly, our case allows for tracing the temporal dynamics of "framing" surrounding reinvestment as well. In the case of the Ganz-MÁVAG site, dominant narratives shifted from factory to brownfield, then to Chinatown, later to niche tourism, ultimately producing a rather ambivalent attraction. We argue that this shift demonstrates that framing is not a linear progression but a conflictual process marked by feedback loops, contestation, and coexistence of competing interpretations.

(v) Taken together, our case study strongly confirms earlier critiques by Dunford, M. (1993, 1996), and Smith, A. (1998), showing that "up" and "down" positions do not manifest uniformly but often coexist simultaneously. The same structural position (such as socialist industrial expansion followed by post-socialist crisis) can generate radically different everyday experiences across various social groups and even individuals. Hence, the seesaw emerges not merely as a temporal economic cycle, but as a movement lived through social differentiation, producing classed, ethnicised, and spatialised experiences of uneven development.

Overall, the case of the Ganz-MÁVAG site demonstrates that the seesaw of uneven development is not only an economic mechanism, but also an emotional, moral, and identity-related movement – thus, when read relationally, our findings highlight the multiplicity of lived experiences attached to the same structural unevenness.

Conclusions

Our paper aimed to bring together uneven development and everyday life through the example of an industrial/deindustrialising milieu.

Building on this aim, the paper's core contribution lies in showing that Neil Smith's seesaw is not only a political-economic model of cyclical capital movement, but also a powerful heuristic for tracing how "up" and "down" positions become lived, narrated, moralised, and affectively registered in everyday life. By explicitly "bringing Lefebvre in" through the seesaw metaphor (most notably via the distinction between abstract space and the space of everyday life), the study demonstrates how structural investment–disinvestment cycles are translated into situated life-worlds marked by security vs. insecurity, pride vs. shame, attachment vs. estrangement. Crucially, this lived dimension is shown to be central rather than supplementary to uneven development, as it is through everyday experience that macrostructural shifts acquire social meaning and durability. At the same time, our analysis reinforces a relational understanding of uneven development. A key conclusion is that being "up" or "down" on capital's seesaw is never absolute, but always relationally produced across spatial scales and social positions. The same structural phase (industrial expansion, stagnation, or crisis) can be narrated as uplift, stagnation, or even loss depending on who is speaking. In this sense, the seesaw is not merely a temporal cycle, but a socially differentiated movement, unevenly experienced within the same period and place.

Empirically, the paper addresses a persistent research gap by providing an industrial/deindustrialising case-based account of how investment and disinvestment cycles are experienced and narrated, rather than quantitatively measured. By foregrounding everyday experiences, perceptions, memories, and framings (including the "afterlife" of a devalued industrial landscape), the study extends uneven development research into domains of meaning, affect, and moral evaluation that have remained underexplored, particularly in (de)industrial(ised) contexts. Within this empirical contribution, our investigation also allows for a conceptual refinement of the notion of "reinvestment". Rather

than treating capital's return as a uniform (or self-evidently positive) moment, our findings show that reinvestment matters not only in magnitude but in form as well. In our case study, the post-crisis "upwards" trajectory was characterised by post-industrial revalorisation through trade, logistics, and retail. This pathway generates distinct symbolic and emotional consequences, underscoring that the quality of reinvestment is at least as consequential as its mere occurrence.

Finally, the findings also substantiate that the seesaw is simultaneously classed, ethnicised/racialised, and spatialised. "Up" and "down" positions are distributed unevenly within the same site and historical moment, as experiences of loss, recovery, or opportunity often diverge sharply between social groups. What constitutes decline for some may simultaneously represent relative uplift for others, illustrating how uneven development is lived through intersecting social hierarchies rather than as a uniform condition. In this broader sense, the paper also suggests that the vernacular framing of "*sometimes up, sometimes down*" ("*egyszer fenn, máskor lenn*") can serve as a productive bridge between academic theory and everyday understanding. By resonating with how communities themselves narrate industrial and post-industrial change, the seesaw metaphor enables uneven development research to engage more directly with lived experience, without relinquishing its critical political-economic foundations.

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The lived experiences of farming under profound landscape transformation – The case of the Sand Ridge, Hungary

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Abstract

Food production became particularly challenging in our current food system under the conditions of the ecological crisis, including climate change. According to our political-ecological approach, landscape transformations and the everyday experiences of agricultural producers are partly the result of uneven geographical development and vice versa, industrial agriculture contributes to uneven development through the production of nature and landscape. By focusing on one of Hungary's most vulnerable landscapes undergoing profound land use transformation, the Sand Ridge within the Danube–Tisza Interfluve, we aim (1) to trace the production of nature and accompanied landscape transformation caused by extractivist practices (industrial agriculture, forestry, solar extractivism) and the integration into global food systems; (2) to reveal the experiences of farmers and (3) the ways farming can contribute to landscape regeneration and food system transformation. Based on documentary and GIS data analysis, expert (11), oral history (23) and focus-group (2) interviews with farmers and farmworkers our research shows that the aridification of the Sand Ridge is not only caused by seemingly "external" processes of climate change, but by "internal" processes of extractivist agricultural production which is interlinked with the world economy through trade. Historically, agricultural landscapes have been produced through trade relations integrated into the global economy, increasing aridification through drainage and large-scale afforestation, both resulting in the marginalization of pasturing as a livelihood system. The recent emergence of the Sand Ridge as an energy periphery under solar extractivism contributes to the further marginalization of pasturing and small-scale food production. Landscape regeneration and food system transformation goes hand in hand. Regenerative practices in agriculture are hindered by how the Sand Ridge is integrated to the global economy. Still, small-scale farmers (and pastoralists) have agency in regenerating the landscape through building regionally more embedded food system alternatives.

Keywords: production of nature, uneven development, landscape transformation, food system, agriculture, everyday life, lived experiences

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Introduction

Food production became particularly challenging in our current food system. The increased integration into the global economy both transformed landscapes and caused livelihood challenges to pastoralists, small-scale farmers and farmworkers (Trauger, A. 2022). Due to these occupational stressors it is not surprising that farmers and farmworkers globally face high levels of depression, anxiety, burnout, suicide ideation, and suicide (Bryant, L. 2022; Knežević Hočevar, D. and Slovenc Grasselli, M. 2023; Jones, A.Q. *et al*. 2024). Agrarian change in Central and Eastern Europe (CEE) was especially rapid and devastating for the livelihoods of

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farmers and farmworkers after 1989. In spite of mobilizing for an alternative food system, the decline of agricultural prices and production in connection with the process of European integration (which forced new member states of the EU to open their borders to import products) contributed to further fragmentation of those engaged in agricultural production (farmers and farmworkers), icluding the emergence of anti-liberal and anti-Roma sensibilities among independent agricultural producers (Szombati, K. 2018, 3). Beyond marginalizing producers industrial agriculture along with other extractivist practices driven by an increased integration to the global economy degrade landscapes.

We analyse the relationship between landscape transformation through extractivist practices, particularly industrial agriculture and its lived experiences in one of Hungary's most climate-vulnerable regions, the Sand Ridge of the Danube–Tisza Interfluve. In the Sand Ridge, accounting one tenth of Hungary's territory, the forest steppe landscape was intensively transformed through the introduction of industrial production systems in agriculture and forestry and the increased integration of these production systems to the global economy. The extractive uses of the landscape for forestry and industrial agriculture, supported by productivist policies, such as the EU's Common Agricultural Policy (CAP) (Tilzey, M. and Potter, C. 2016; Kovács, A.D. *et al*. 2024), not just contribute to the ecological crisis of the region (including water scarcity and groundwater decline, desertification and soil degradation, the increasing frequency and intensity of droughts), but are constrained by it. The loss of profitability of forest management and industrial agriculture intersecting with the global solar boom and the rise of the region as an energy periphery[3] results in an even more intensified land use transformation in the region (Farkas, J.Zs. *et al*. 2023; Mihály, M. and Fabula, Sz. Forthcoming) displacing local land-users.

In this study we explore landscape transformation from a world ecology perspective. World ecology is a concept that views the world as a single, interconnected system where humans are part of nature, and capitalism is intertwined with the web of life (Moore, J.W. 2016). We addresss the following research questions:

1. How is landscape transformation driven in the Sand Ridge in modern capitalism by extracive practices?

2. What are the lived experiences of farming under the conditions of profound landscape transformation?

3. In what ways can farming contribute to landscape regeneration and food system transformation?

To answer our research questions we engage in the following section with world ecology perspectives incorporating reflections on the production of nature thesis (developed in the political economic theory of uneven development) driving landscape transformation through extractive practices. We also rely in our conceptual framework on the feminist critique of political economic approaches to integrate the lived experiences of farmers and farmworkers into larger debates of food system transformations. We outline then why we are convinced that selecting the Sand Ridge (and two – formerly – agricultural settlements within it) to study landscape transformation and its lived experiences with a wide range of qualitative methods helps us in answering our research questions. In the sections presenting the results, we first focus on how extractive practices drove landscape transformation in the Sand Ridge from the Middle Ages onwards. To better understand everyday life under conditions of profound landscape transformation, we contrast the lived experiences of farming in two (formerly) agricultural settlements within the Sand Ridge, Inárcs and Kecel. To grasp the agency of farmers in an inten-

[3] Energy peripheries are defined as places that are systematically disadvantaged through the whole energy system due to their inferior position within the asymmetrical spatial distribution of material, economic, political and symbolic resources and capabilities (Golubchikov, O. and O'Sullivan, K. 2020, 1).

sively transforming landscape we present some potentials for landscape regeneration and food system transformation in/from the Sand Ridge. Finally, we conclude our study on how landscape transformation is driven by extractive practices in modern capitalism and what potentials emerge for regeneration and food system transformation.

Landscape transformation and its lived experiences

In this study, we investigate the connections between landscape transformation, extractivist production practices (industrial agriculture, forestry and solar energy) and climate change in the Sand Ridge (Hungary) from a world ecology perspective. In a world ecology approach, humans are considered to be part of nature and capitalism is seen as operating through the web of life. Capitalism is not merely defined as an economic system, but also as an "ecological regime", uniting capital accumulation, power, and environmental transformation into a single, continuously evolving historical process (Moore, J.W. 2016). The focus is on understanding the complex relationships between human society, the environment, and the production of nature. The "*production of nature*" thesis as a core component of world ecology, refers to the human creation and shaping of environments and landscapes on various scales through historically and geographically specific processes (Loftus, A.J. 2017), fundamentally challenging the idea of pristine, untouched nature. Capital circulates through nature, but nature also circulates through capital, for example through biotechnology (e.g. hybrid seeds), as such products appear in the soil, in different bodies, in food, etc. (Castree, N. 2000; Smith, N. 2007).

Landscape transformation in modern capitalism is driven by *extractive* practices serving capital accumulation. To understand the dynamics of accumulation in modern capitalism David Harvey (2001) developed the concept of the *"the spatial fix"*. Spatial fix refers to the (temporal) strategies and solutions that capitalism undertakes to transcend its inherent crises of overaccumulation (ibid.). In concrete contexts, the fix may materialize in investment in new geographical territories, opening new markets, technological innovations with spatial features, and pursuit of cheaper inputs (Ekers, M. and Prudham, S. 2017). To grasp how global capitalism pursues to continue accumulation and profit-seeking from curing ecological crises, including climate change, the concept of "*the socioecological fix*" was developed (Castree, N. and Christophers, B. 2015; Ekers, M. and Prudham, S. 2015, 2017; McCarthy, J. 2015). The socioecological fix takes spatial fixes as metabolic processes whereby not only is space restructured but also nature has been transformed (Ekers, M. and Prudham, S. 2017). Although socioecological fixes may help capitalism overcome the accumulation crisis temporarily (McCarthy, J. 2015), the consequences could be profoundly disturbing (Ekers, M. and Prudham, S. 2017, 16). Therefore, rural land markets are important for the survival of capitalism as crises can be overcome or shifted over time by reworking the circulation of capital in ecological processes and landscapes (Ekers, M. and Prudham, S. 2015). This process is inherently political, as it involves the direct participation of states, particularly when land is not available on the market, such as in the case of dispossession of protected areas (Korfiati, I.P. 2019).

Scholars increasingly recognize that *extractivism* has not only featured extractive activities in resource-abundant places in the shadow of colonialism (e.g. Latin America where the term originates, Hu, Z. 2023, 3), but has also become a modality and ideological rationale of contemporary global capitalism (Dunlap, A. and Jakobsen, J. 2020; Ye, J. *et al*. 2020; Shapiro, J. and McNeish, J.A. 2021; Chagnon, C.W. *et al*. 2022). As Gudynas, E. (in Hu, Z. 2023, 3) conceptualized, extractivism is mainly confined to the practices of resource extraction and has three defining dimensions: 1. Extraction of natural resources; 2. Environmental degradation; 3. Extraction for export with little

domestic processing. Landscape transformations based on extractivist practices are realized through *accummulation by disposession*, the enclosure of public assets by private interests for profit, resulting in greater social inequality (Harvey, D. 2007). In terms of landscape transformation of the Sand Ridge industrial agriculture, industrial forestry and solar extractivism are the most relevant. *Industrial agriculture* is considered an extractive land use because it is based on the appropriation, extraction and degradation of natural resources – such as soil nutrients, water, and biodiversity – vital to present and future generations (Anderson, M.D. and Rivera-Ferre, M. 2021, 22). Industrial agriculture also extracts people from their communities, to serve as cheap labour in other countries (Patel, R. and Moore, J.W. 2017), cheapens labour by de-skilling and replacing people with chemicals and machines, and extracts territory itself in the inexorable quest for greater profits (Anderson, M.D. and Rivera-Ferre, M. 2021, 22; Reigada, A. and Castro, C.D. 2022). *Industrial forestry*, a reductionist approach simplifying complex forest ecosystems into quantifiable, monetizable traits (Scott, J.C. 1999) can also be considered an extractive land use. As an intensive, (often) export-oriented model focused on the large-scale harvesting of timber or plantation monocultures for industrial use (Park, C. and Allaby, M. 2012), industrial forestry often results in significant environmental degradation, biodiversity loss, and conflicts with local or indigenous communities over territorial rights (Holz, J.R. and Saave, A. 2025; Beltrán-Véliz, J. *et al*. 2026). Extractive practices of renewable energy generation emerge with recent land-intensive climate policy measures built on discourses of green transition and inclusive development (García-Dory, F. *et al*. 2022; Hu, Z. 2023; Brown, D. *et al*. 2024; Mihály, M. 2025) often involving green grabbing, a specific form of *accumulation by disposession*. Among them is *solar extractivism*, which is characteristic of the Sand Ridge. It is featured by large-scale land acquisition, prioritization of solar electricity production, domination of renewable industries, deep engagement from state power, violence associated enforcement and neglect of local socio-ecological systems (Hu, Z. 2023, 11). Beyond being deeply rooted in transnational commodity flows extractivist practices are also part of the territorial unevenness of global capitalism (Riofrancos, T. 2020).

Uneven development leads to significant investment and higher incomes in industrial agriculture (and forestry) in some areas, while in other areas it results in disinvestment and a crisis in traditional agriculture (Balakrishnan, S. 2019). In terms of labour, uneven development plays out in the migration flows at the production-end of the food system supply chain where cheap (low-skilled, low-waged, often gender and racially segregated Trauger, A. 2022, 151) labour flows to places with relatively higher development (Patel, R. and Moore, J.W. 2017). The global agro-industrial complex and the linkages between uneven development involve multidimensional and multiscale processes, from the everyday to long cycles of macroeconomic systems (Blyth, M. and Matthijs, M. 2017; Giraudo, M.E. 2017).

As the theory of uneven development can be applied on various scales it can be fruitfully combined with the everyday life approach (Berki, M. and Sági, M. 2026; Timár, J. and Trócsányi, A. 2026). *Lived experience* refers to the activities and embodied forms of consciousness of situated socially marginalized groups (such as farmers and farmworkers) that are either at some distance from, or different from, official and dominant accounts and consciousness (Alcoff, L. 2006; Fanon, F. 2008). If discourse refers to the successful political ability to bring elements together into a stable unity, "lived experience" characterises a situation in which this has not been possible (Ngcoya, M. and Kumarakulasingam, N. 2017, 486). As such, lived experience as a form of consciousness can be understood to be partial, or fragmentary and unable to be articulated into a political project or movement (ibid.). At the same time, lived experience directs us to take seriously the subjectivity of socially marginalized actors. It emphasizes how subjectivity

should be thought of in terms of constrained choices, as opposed to outright resistance to, or escape from, power (Kruks, S. 2014). This, we argue, allows us to conceive mobilizations for alternative food systems as a situation produced by historical constellations of power, and the response to that situation under conditions of constraint. Based on the post-Cartesian approach of world ecology (and production of nature), we believe that landscapes could be regenerated through agroecologically-minded agriculture and a regional food system building on the characteristics of the landscape.

We write this paper from a political ecology (Giraldo, O.F. 2019; Pain, A. and Hansen, K. 2019; Jimenez-Soto, E. 2021) perspective that incorporates reflections on the production of nature thesis (developed in the political economic theory of uneven development) driving landscape transformation through extractive practices and integrates the lived experiences (the feminist critique of political economic approaches) of farmers and farmworkers into larger debates of food system transformations (*Figure 1*). With this approach, we combine the political ecology of landscape transformation trough extractive practices, the political economy of uneven development, and the cultural geographical notion of everyday life and space-related experience. In this way, it is possible to grasp the connection between historical landscape transformations, the multiscalar historical processes of economic development / underdevelopment, and the experience of and resistance to changing spatial inequalities that can be understood by retrospective analysis of personal memories.

Methodology

Climate change and extractive land use practices not fitting to the ecological characteristics of the region result in profound landscape transformation. The Sand Ridge of the Danube–Tisza Interfluve, a lowland forest-steppe landscape (80–120 m a.s.l.), once rich in surface waters is now heavily affected by declining ground-water level and salinisation (Biró, M. *et al.* 2008, 2013). Due to the low water retention capacity of its soils (mainly

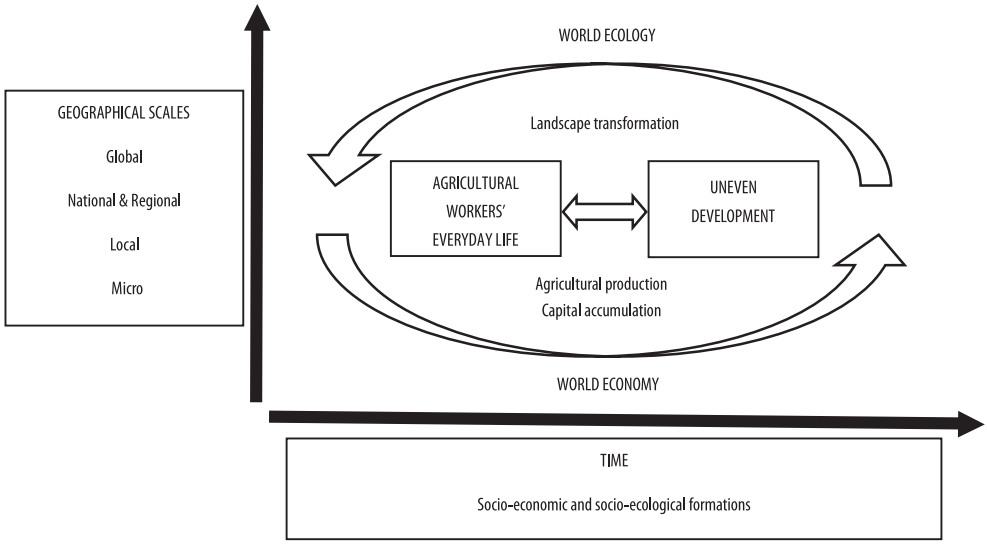

Fig. 1. Conceptual framework: The relationship between uneven development and agricultural workers' (farmers' and farmworkers') everyday life in the context of world ecology. *Source:* Compiled by Fabula, Sz.

sand and sandy loam, *Figure 2*), the region is highly vulnerable to drought (Lennert, J. *et al*. 2024a, b). Its sandy soils are suitable only for either labour-intensive agricultural production, notably wine and fruit production, or extensive types of cultivation, such as forestry or grazing (Lennert, J. *et al*. 2024b, 10). Intersecting with the global energy boom of the 2010s, and the increased abandonment of agricultural land since the 1980s (Csatári, B. and Farkas, J.Zs. 2008), the region is becoming a hot spot for solar energy generation.

To better understand (1) *how landscape transformation is driven in modern capitalism by extracive practices*, we started with reviewing the literature on local and regional history of the Sand Ridge, public policy and newspapers (Arcanum online database), and relied on GIS-based analysis of agricultural statistics (e.g. KSH TIMEA, Corine). We conducted 11 semi-structured interviews with experts of the region and/or alternative food systems. Researchers, farmers, rangers, community organizers, alternative food system activists, politicians and water management officials were among our interview partners from the field of ecology, hydrology, nature conservation, geography, ethnography, agroecology and rural development *(Table 1, Appendix 1)*.

To better understand (2) *the lived experiences of farming under conditions of profound landscape transformation* and (3) *the agency of farmers in landscape regeneration and food system transformation* we compared the lived experiences of farming in two contrasting cases from the region (Kecel and Inárcs). Towards the end of the 18th century, prior to the large-scale afforestation of the Great Hungarian Plain and the introduction of labour-intensive agricultural production, pastoralism and grasslands characterised the landscape of both Inárcs and Kecel (Bárth, J. 1984; Czagányi, L. and Kulcsár, G. 1995). Recently, agriculture[4] has been abandoned at a rapid rate in Inárcs, on the northern edge of the Sand Ridge in its „Budapest Gateway" sub-region *(see Figure 3)*. Urban sprawl around Budapest (Kovács, Z. *et al.* 2019) intensifying after 1989 and the renewable energy boom after 2018 (Mihály, M. and Fabula, Sz. Forthcoming) results in the displacement of remaining small-scale farmers in Inárcs. Agricultural production is being hindered by a significant groundwater-level loss (6–7 m) in Kecel (Ladányi, Zs. 2010), located on the highest ridge (172 m) of the Sand Ridge in its „Agriculture and Food Production" subregion (*Figure 3*). Grape and fruit cultivation has been characteristic here as the deeper root systems of these plants are able to reach the moisture in the soil. In addition to 14–16 semi-structured and oral history interviews with integrators, farmers and farmworkers from Inárcs and Kecel we organized a walk-along focus group discussion with 4 farmers affected by a solar power plant built on previously agricultural land in Inárcs and a sociodrama workshop with ten farmers from Kecel (see *Table 1*).

With the guidance of two sociodrama experts, Cecília Kovai and György Mészáros,

Table 1. Interviews conducted during the research

Interviews	Inárcs	Kecel	SUM
Expert (local)	4	5	9
Oral history (farmers)	7	9	16
Oral history (farmworkers)	2	4	6
Focus groups (walk along / sociodrama)	1	1	2
SUM	*14*	*17*	*31*
Expert (Sand Ridge)	–	–	11
SUM	–	–	*41*

Source: Compiled by Mihály, M.

[4] Being depopulated during the Ottoman Rule the territory of Inárcs was used as a "puszta" for grazing cattle, horse and sheep (Czagányi, L. and Kulcsár, G. 1995). The development of the capitalist agricultural economy accompanied by the revolution of trade (Budapest–Lajosmizse railway line reaching Inárcs in 1889) introduced rapid land use transformation here. Grape and wine (Czagányi, L. and Kulcsár, G. 1995, 326), fruit (apple, plum, sour cherry, pear, later strawberry) and vegetable (potato, cauliflower already in the turn of the 20th century and asparagus later, during state-socialism Czagányi, L. 1995) provided a livelihood to people living in the settlement.

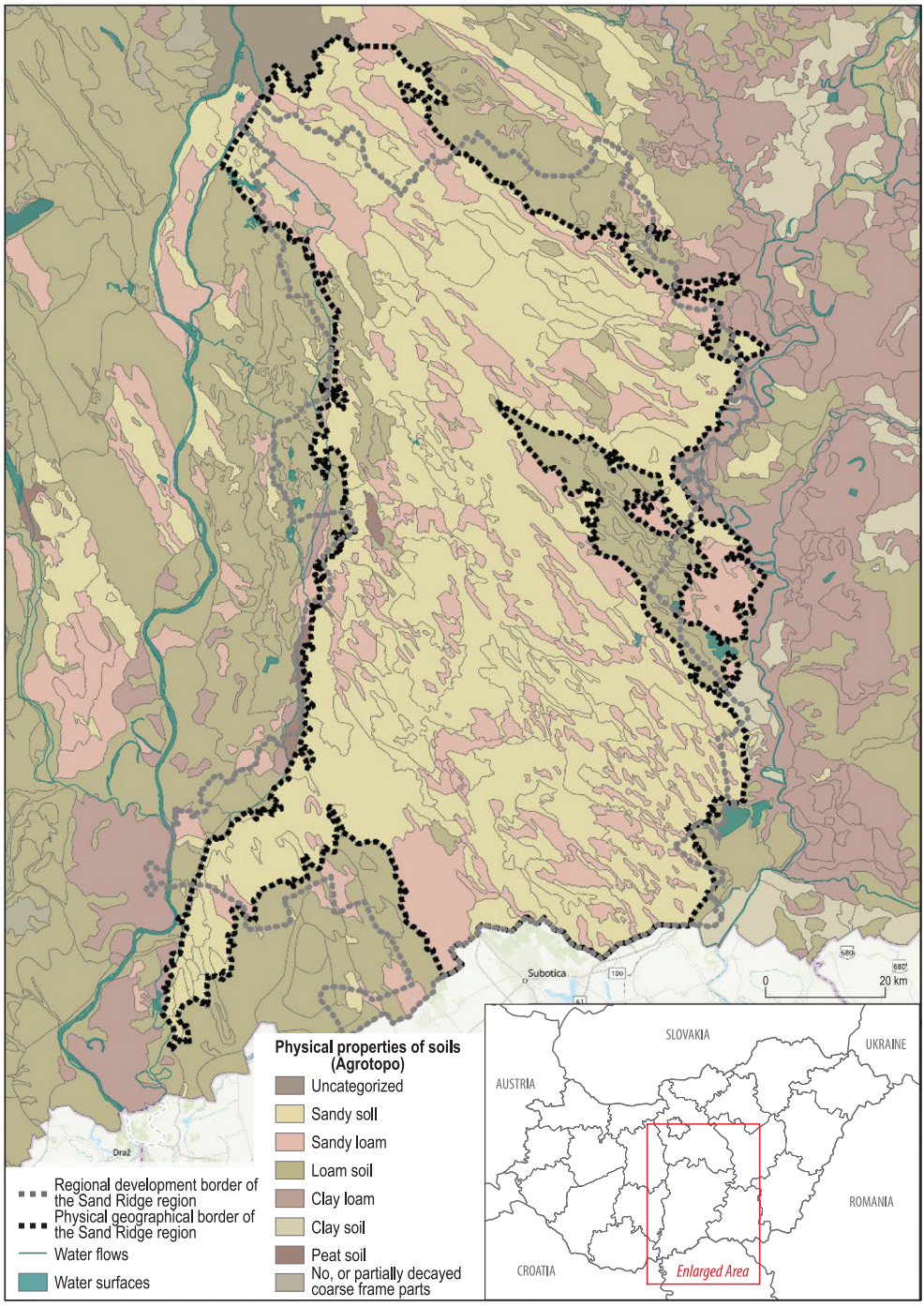

Fig. 2. Boundaries of the Sand Ridge: Regional policy (grey) and physical geography (black).
Source: Tagai, G. based on the AGROTOPO database.

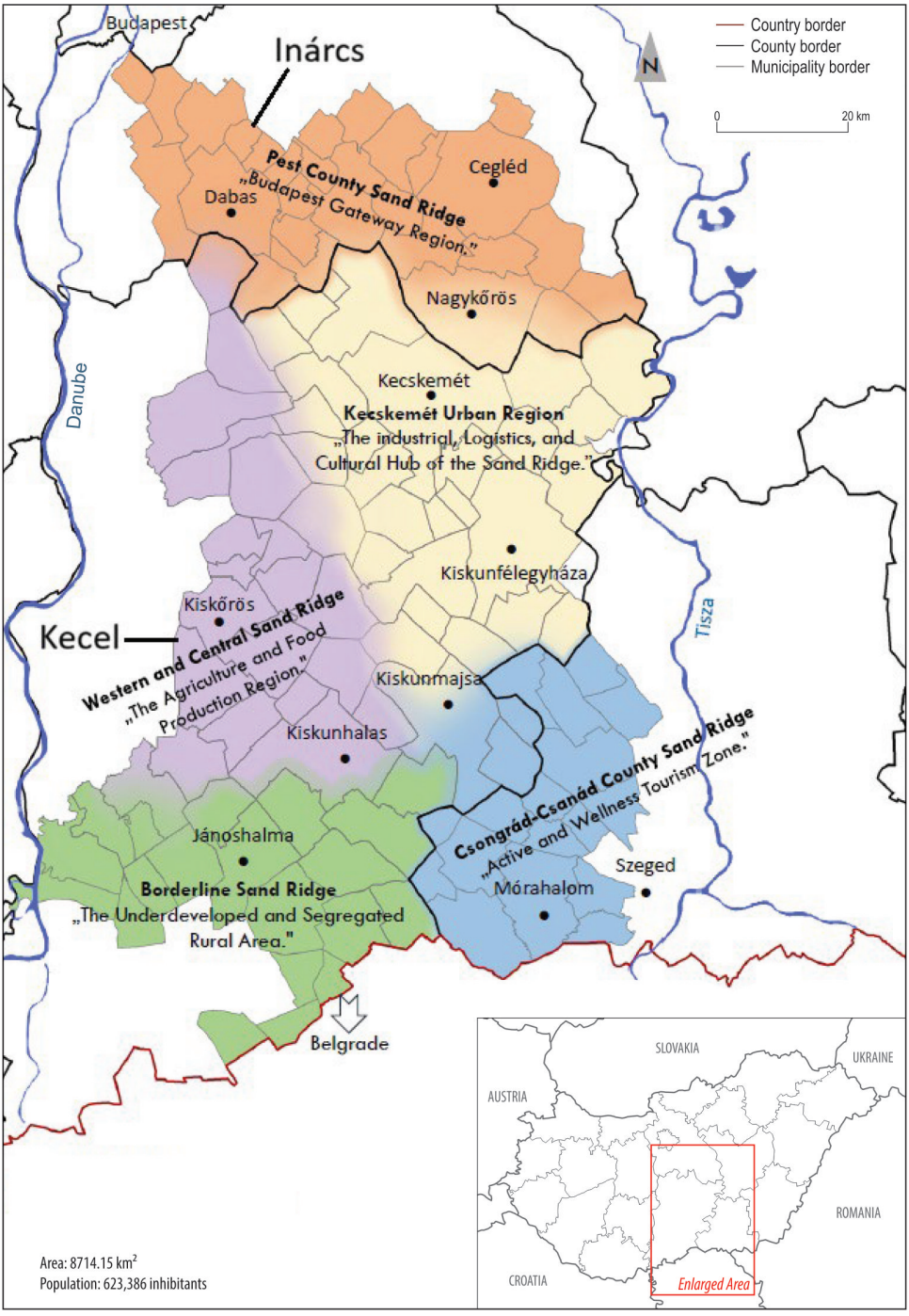

Fig. 3. The position of Inárcs and Kecel within the Sand Ridge. *Source:* Authors' own compilation, based on Kovács, A.D. *et al.* 2024, p. 6. The original map was produced by Vasárus, G.

we invited farmers from Kecel and the surrounding area to perform scenes from their daily lives and reflect on their position of power within the food system. This experiential group work, which is used in participatory, action-based research (Sternberg, P. and Garcia, A. 2000; Ius, M. 2020) enabled us to explore farmers' emotions and lived experiences of the ongoing climate crisis in the Sand Ridge, as well as their marginalized positions within the global food system. It also allowed us to uncover traits of their transformative/regenerative agency. Unlike with farmers, interviews and focus groups only gave us a limited insight into the perspectives of farmworkers, who could not spend much time participating in the research.

We analysed documents, our notes and verbatim transcripts of the interviews collaboratively in a shared platform (google drive). The main concepts, namely production of nature, uneven development, everyday life, were operationalized by inductive analysis and coding of the interviews *(Appendix 2)*.

Landscape transformation in the Sand Ridge through extractive production

Although the medieval period did not produce nature in the capitalist sense theorized by Neil Smith, medieval societies were heavily involved in reshaping and socially organizing nature through agricultural, technological, and symbolic practices. These processes laid the groundwork for the more intensive and commodified 'production of nature' that emerged during the 19th, consolidated in the 20th century, when interaction between states, land, and landowners underwent changes that facilitated the maximisation of extraction, be it through industrial agricultural production, forestry (Balogh, R. 2026, 43), or recently renewable energy generation (Hu, Z. 2023; Brown, D. *et al*. 2024; Mihály, M. and Fabula, Sz. Forthcoming). Through the case of the Sand Ridge we identify how landscape transformation is driven through extractive practices in modern capitalism, historically through industrial agriculture, forestry and more recently renewable energy generation.

Pre-capitalist integration to the global economy

The original Holocene forest-steppes and their diverse habitats disappeared due to deforestation during Medieval times (Biró, M. *et al.* 2013). Grazing was benefited by both deforestation, which increased the amount of land available for cultivation and grazing (Ferencz, Á. *et al.* 2019, 65) and climatic conditions, such as the cool, wetter period in the Carpathian Basin during the 17th century (Rácz, L. 2001). To increase pasture zones in response to the needs of the growing number of their livestock, in the late 14th and early 15th century, major market towns in the Great Hungarian Plain (GHP) started buying up and renting abandoned farmlands (reffered to as 'puszta' – deserted land) in their neighbourhood (Csippán, P. and Ferenczi, L. 2020, 3). Extensive livestock husbandry, one of the most profitable economic sectors of the GHP, which made Hungary the biggest exporter of livestock in Europe between the mid-15th and 18th centuries, relied on the abundance of water in the GHP (Pinke, Zs. 2014; Demeter, G. *et al.* 2022). The most characteristic of the extensively kept species in the GHP – including the Danube–Tisza Interfluve – was the Hungarian grey cattle (Surányi, B. 2020). As one of the major meat producers (both in quality and quantity) in Central Europe, they were a significant export item (Surányi, B. 2020, 285).

The increasing Western European meat demand driven by processes of urbanization was largely covered from cattle grazed in Eastern Europe. In the "golden age" of the Hungarian grey cattle (between 1540s and 1620s), built on a well-organized logistical background, several hundreds[5] of cattle were yearly driven on foot to Western European

[5] In the 16th century approximately 100,000 cattle were exported annually from Hungary, with peaks of up to 200,000 cattle in exceptional years to Venetian markets (Fara, A. 2022, 655).

cities (such as Nuremberg, Augsburg, Vienna, Venice, see Csippán, P. and Ferenczi, L. 2020) from the GHP. As a result of this early integration into the global economy, landscapes of the GHP, including the Sand Ridge faced overgrazing (Varga, A. 2018). It is important to emphasize that overgrazing was not caused by pastoralists' improper approach to land management or by traditional ecological knowledge that was insufficiently adapted to local ecological conditions (Varga, A. 2018), but rather by the pressure to overexploit resources imposed on them through an export-oriented model of animal husbandry.

Industrial agricultural production

The cultivation of *vineyards and orchards* on farmsteads came as a response to the pre-capitalist integration of the Sand Ridge to the world economy. Alongside large-scale afforestation in the GHP, the emergence of smallholder farming in the 19th and 20th centuries formed part of a *socioecological fix*, introducing a labour-intensive agricultural production system while mitigating the effects of sand drift caused by overgrazing resulting from an export-driven animal husbandry. The territorial expansion of small-scale farmsteads in the 19th century was facilitated by both ecological factors, such as the phylloxera epidemic (to which the sandy soils of the Danube–Tisza Interfluve [see *Figure 2*] were immune), and economic factors, such as the fruit boom at the turn of the century (Rigó, R. 2023, 41–42). In addition to grapes, fruit and small-scale grain production, farmsteads also played an important role in cattle breeding, milk production, pig, sheep and poultry farming, which attracted an increasingly significant food industry to the towns of the region (Rigó, R. 2023, 43).

Small-scale farmsteads survived state socialism and, although they have lost much of their agricultural function (Takács, A. 2005), they still characterise the Sand Ridge, with an average of 16 percent of the population living on the outskirts of farmsteads (Farkas, J.Zs. *et al.* 2023, 34). Soil quality helps explain why smallholdings remain more common in the Danube–Tisza Interfluve than elsewhere in the country (Interview E_05, E_04, E_06). Land concentration took place on good-quality land after 1989 (Csatári, B. *et al.* 2019; Lennert, J. and Farkas, J.Zs. 2020). These areas are highly mechanized and characterized by labour-efficient monoculture crop production (wheat, corn, sunflower, rapeseed) (Szabó, D. 2020). As sandy soils are not ideal for growing these crops (not least because of drought), smallholdings growing vegetables and fruit, mainly for the domestic market (KSH TIMEA; Szabó, D. 2020) characterize agricultural production in the area. In vegetable production, small-scale farmers compete with imported agricultural products and to maintain their profitability they use chemicals, fertilizers, and water (for irrigation). Vegetables require more water than cereals, but the water retention capacity of sandy soils is much poorer than that of better quality soils (Szabó, D. 2020; Lennert, J. *et al.* 2024a; Interview E_02, E_01). Similar to vegetables, beyond increasingly frequent frost damage and hailstorms resulting from climate change, fruit trees now often need to be watered if farmers want to achieve acceptable yields (Lennert, J. *et al.* 2024a, I_01, I_06). Thus, labour-intensive agricultural production, such as fruit and vegetable production, both contributes to the aridification of the region and is constrained by it.

Even though the ecological characteristics of the region made highly mechanized, labour-efficient monoculture crop production difficult, an important milestone in the transformation of the forest steppe habitats of the Sand Ridge was the European grain boom of 1850s–1870s. As Hungary had been self-sufficient in cereals even before the river controls of the 19th century (Pinke, Zs. 2014, 93), the transformation of floodplains into arable land served to increase Hungary's grain export. An increased demand driven by the geopolitical interests of Austria waging wars throughout the 18th century and a wave of industrialization from the 19th century in-

tersected with favourable ecological conditions for grain production[6] in the Sand Ridge. Both mass armies of the Austro-Hungarian Monarchy and workers migrating from rural to urban areas in Western Europe relied on bread as staple food. To serve the goals of capital accumulation, food provision for the mass armies and workers had to be solved at the lowest possible price in order to ensure that money spent on food would not push wages up (Sidó, Z. and Szarvas, M. 2020). Through increasing the navigability of the Danube (Andrásfalvy, B. 1973; Ihrig, D. *et al*. 1973) and developing the Carpathian Basin's railway network[7] (Szilágyi, Zs. 2021), technological developments revolutionised transport, fostered capital accummulation, increased the integration of the SR to the global economy, drove regional economic growth and allowed farmers of the GHP to benefit from the European grain boom (Beluszky, P. 2000; Győri, R. 2003; Rigó, R. 2023).

The increased global economic integration of the Sand Ridge came at an ecological and social price. New frontiers for capital accummulation (further arable land) were gained through water and river regulation and drainage (Rigó, R. 2023; Interview E_02). The biggest river regulation of the 19th-century Europe (Tisza) significantly transformed the landscape of the GHP. Through the elimination of the majority of floodplains of Hungary (23%), the megaproject was based on *accummulation by disposession*, as it transformed commons-based extensive animal husbandry contributing to the peasant and pastoralists livelihoods in various ways to an individual property-based cropland farming of large-scale landowners (Pinke, Zs. 2014; Demeter, G. *et al*. 2022). Land speculation characteristic in the area east of the Tisza drove the project even after the American grain invasion of the 1870s through forcing the state to take an even larger stake in river regulation (Pinke, Zs. 2014, 94). The systematic drainage of the Sand Ridge served the production of further arable land and occurred relatively late in the 1940s (Ujházy, N. and Biró, M. 2018; Interview E_05) and continued after World War II. Drainage, together with irrigation and drinking water extraction resulted in a serious decrease in groundwater levels between 1968–1972, and 1993–1997 (0.92 m in average with a maximum of 5–6 m [Kovács Székely, I. and Szalai, J. 2009]). Agricultural production was most intensive during the 1980s, when fertilizer use in the region reached a peak too[8]. Processes of aridification caused profitability challenges in agriculture, resulting in the abandonment of agricultural areas from the 1980s (Csatári, B. and Farkas, J.Zs. 2008). An answer to aridification and the worsening soil quality on dry sand was to move cropland "downwards" into previously wet depressions. Areas with high ground-water level decrease were more prone to ploughing and afforestation contributing to further grassland loss (Biró, M. *et al*. 2013).

Industrial forestry

The systematic afforestation of the GHP, after the Treaty of Trianon is another important milestone in the transformation of the landscape in the Sand Ridge. As a mosaic-like forest steppe habitat the Sand Ridge (Biró, M. *et al.* 2008) did originally not consist of contiguous forest, but rather an alternation of open sandy grasslands, sandy scrublands, and smaller and larger patches of forest (poplar-juniper and sandy oak) (Biró, M. *et al*. 2013).

[6] The warmer, drier period of the 18th century caused the water-covered areas of the Sand Ridge to recede, allowing for the renewed expansion of arable land and grain production (Szilágyi, Zs. 2021).

[7] The construction of railways was cheaper and faster in the GHP, so the railway line reached the main cities of the Sand Ridge early (Szolnok, 1847; Kecskemét, 1853) and by the end of the Monarchy, almost every inhabited farmstead was within eight kilometres or a day's journey by horse-drawn carriage of a railway station, enabling farmers, to sell grain, wine and fruit produced in the area on the markets of Budapest and abroad (Rigó, R. 2023).

[8] In 1980 120,860 tons of fertilizers were used (in 1970 78,500 tons, in 1990 63,300 tons, and in 2000 only 15,700 tons – KSH database, for more details see Csatári, B. and Farkas, J. 2008).

The systematic afforestation of the region started in 1923 (under law no. XIX of 1923), when Hungary lost significant forest areas and struggled with a shortage of wood (Balogh, R. 2026). Beyond alleviating the acute and expected chronic shortage of wood, the program was expected to increase the resilience of farming to periods of water scarcity too (Balogh, R. 2026, 111). Károly Kaán (1867–1940) a prominent Hungarian forest engineer, economic policy expert, and member of the Hungarian Academy of Sciences, is credited with launching the afforestation program in the GHP. Kaán's ideas about the historical ecology, forest cover, and waterlogging of the GHP appear exaggerated in the context of current scientific thought, and imagined the relationship between soil water levels and the physiological processes of trees too schematically, while underestimating the importance of grasslands (Biró, M. and Molnár, Zs. 2009; Tölgyesi, Cs. *et al.* 2020; Balogh, R. 2026, 111). Large-scale afforestation was accompanied by *accummulation by disposession* and the re-negotiation of state power and development (Scott, J. 1999). It contributed to the further decline of common pastureland, in which land and resources were collectively managed by communities (Varga, A. 2018).

Afforestation in state-socialist Hungary can be understood as a dual *spatial fix* and *socio-ecological fix*. As the most ambitious forestry undertaking of the socialist era, it was embedded in the scalar logic of central planning: Article 33 of Act XXV of the 1949 Five-Year Plan mandated a substantial increase in timber extraction (by 300,000 cubic metres) alongside the establishment of 50,000 cadastral acres of new forest in the GHP (Balogh R. 2026, 129). These targets reveal an attempt to spatially redistribute resources and expand the productive landscape, displacing pressures associated with timber scarcity onto newly afforested zones.

At the same time, afforestation functioned as a *socio-ecological fix*, grounded in Soviet agronomic science, which framed ecological transformation as a prerequisite for stabilizing and intensifying agricultural production (Balogh, R. 2026, 132). As articulated in Erdészeti Lapok (Forestry Gazette) (N.N. 1949), forest belts and windbreaks were expected to regulate microclimates, reduce aeolian processes, and gradually transform soil conditions, thereby engineering more productive agro-ecological systems. In this sense, the programme sought not only to reorganize space, but to actively reconfigure ecological processes in ways that would secure long-term accumulation and food production. However, from a contemporary perspective, these fixes (nationally, a response to timber shortages; regionally, mitigation of drought-related instabilities, and an attempt to control drifting sand) appear partial and temporally bounded. Ongoing processes of aridification – now intensified by climate change (Ladányi, Zs. 2010) – expose the limits of earlier socio-ecological interventions and call into question the durability of afforestation as a stabilizing strategy, necessitating a rethinking of land use practices in the region (Tölgyesi, Cs. *et al.* 2020; Interview E_03, E_07).

Solar extractivism

Since 2015 a new land use pattern, land for renewable energy-generation has been gaining ground in the region (SZGK 2023, Interview E_03). The emergence of the Sand Ridge as an energy periphery in the current phase of global capitalism is driven by international Green New Deal policies, the Hungarian state advocating for the peripheral re-industrialisation of Hungary (Nagy, E. *et al.* 2021) and global investors seeking cheap energy. The fact that solar energy has become one of the cheapest energy sources worldwide (Ehsan, R. and S. Ravi, P.S. 2025) has driven interest for land available for renewable energy production. In Hungary, for example, the number of solar power plants installed has grown exponentially in recent years and reached 7,550 MW by 2025. Eighty percent of this capacity has been installed since 2020, and there has been an annual increase of at least 1,200 megawatts since 2022

(BBJ 2025). The geography of the Sand Ridge, flat terrain, high sunshine duration and poor quality soils (cheap land), make the region to become particularly targeted by such projects. Solar power plants are established as greenfield investments dominantly on formerly agricultural land, and often result in the displacement of remaining small-scale farmers and pastoralists (Focus group_walk along_Inárcs – Mihály, M. and Fabula, Sz. Forthcoming). The renewable energy boom pushes land prices up, thus, limiting pastoralists, agroecologically-minded, small-scale or subsistence farmers' access to land. As the case of renewable energy shows the economic crisis of the region resulting in the abandonment of agricultural land since the 1980s is temporarily tackled *through socioecological fix*, in which social and environmental relations are reorganized in the Sand Ridge through solar PV development. The region emerges as a new location for renewable energy production, a place, where the environmental costs of renewable energy transition are unevenly shifted to the rural landscape and its marginalized rural inhabitants (Brown, D. *et al*. 2024).

The main milestones of landscape transformation in the Sand Ridge accompanied by *spatial fixes*, *socioecological fixes* and *accummulation by disposession*, can be linked to (pre)capitalist global economic integration, industrial agricultural production, industrial forestry and renewable energy generation through solar extractivism. Pastoralism, a sustainable agricultural practice traditionally fit to the ecological constraints of the Sand Ridge got marginalized through the mechanization of agriculture and forestry leading to the transformation of the landscape (the production of arable land through drainage, elimination of wooded grazing systems) (Ujházy, N. and Biró, M. 2018, Varga, A. 2018). The emergence of the region as an energy periphery further marginalizes pastoralists and small-scale farmers, as climate policy measures are land-intensive and renewable energy transition is reliant on large-scale appropriation of land (García-Dory, F. *et al*. 2022; Brown, D. *et al*. 2024).

The rise and fall (?) of grape production in the region – and its lived experiences

Both Inárcs and Kecel are part of the Kunság wine region (*Figure 4*), a sub-region of Hungary's largest wine region (the Danube wine region), spanning between the Danube and Tisza rivers. Wine cultivation was established in the region together with other labour-intensive agricultural production systems, such as fruit and vegetable production often undertaken on farmsteads on the outskirts of settlements (more characteristic to Kecel). Although wine cultivation has almost disappeared from Inárcs, it is still prevalent in Kecel (*Figure 5*). Grapes were first mentioned in the town's charter in 1734, and significant vineyards were established there in the 1740s ("Öregszöllők") (Bárth, J. 1984). These vineyards provided a livelihood for serfs and an income for the archbishop (Bárth, J. 1984; Benyák, F. 2021).

The rising importance of the Kunság wine region can be interpreted through the lens of uneven development as a process shaped by shifting spatial configurations of capital. The phylloxera epidemic that swapped across Europe in the late 19th century devastated most of the vineyards in Hungary, while sparing those located on sandy soils, including Kecel and Inárcs. This ecological differentiation created a sudden spatial disparity in value, as areas previously considered marginal – such as the pasturelands of Inárcs – were redefined in 1895 as suitable for viticulture due to their resistance to the disease. Consequently, land prices increased dramatically from 20–60 Hungarian crowns/cadastral acre to 800–1,000 Hungarian crowns/cadastral acre (Czagányi, L. and Kulcsár, G. 1995, 326), reflecting a rapid revaluation driven by new opportunities for capital accumulation. This transformation attracted external investors, who redirected capital into these newly advantageous areas and introduced more modern production methods (Czagányi, L. and Kulcsár, G. 1995, 325; Benyák, F. 2021).

By the beginning of the 19th century, the quantity of grapes and wine produced in

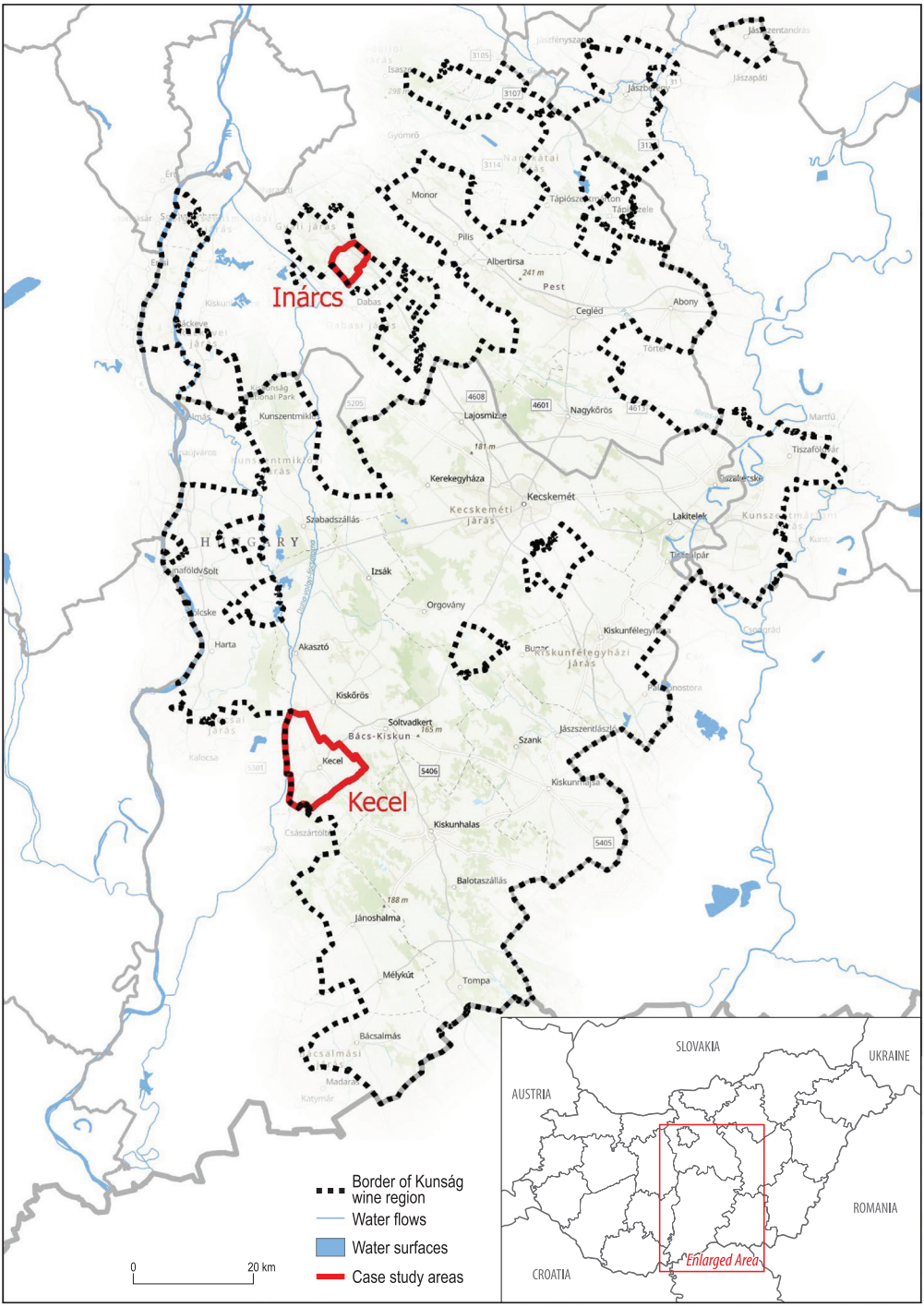

Fig. 4. Map of the Kunság wine region. *Source:* Tagai, G. based on the territorial code system of the HSCO.

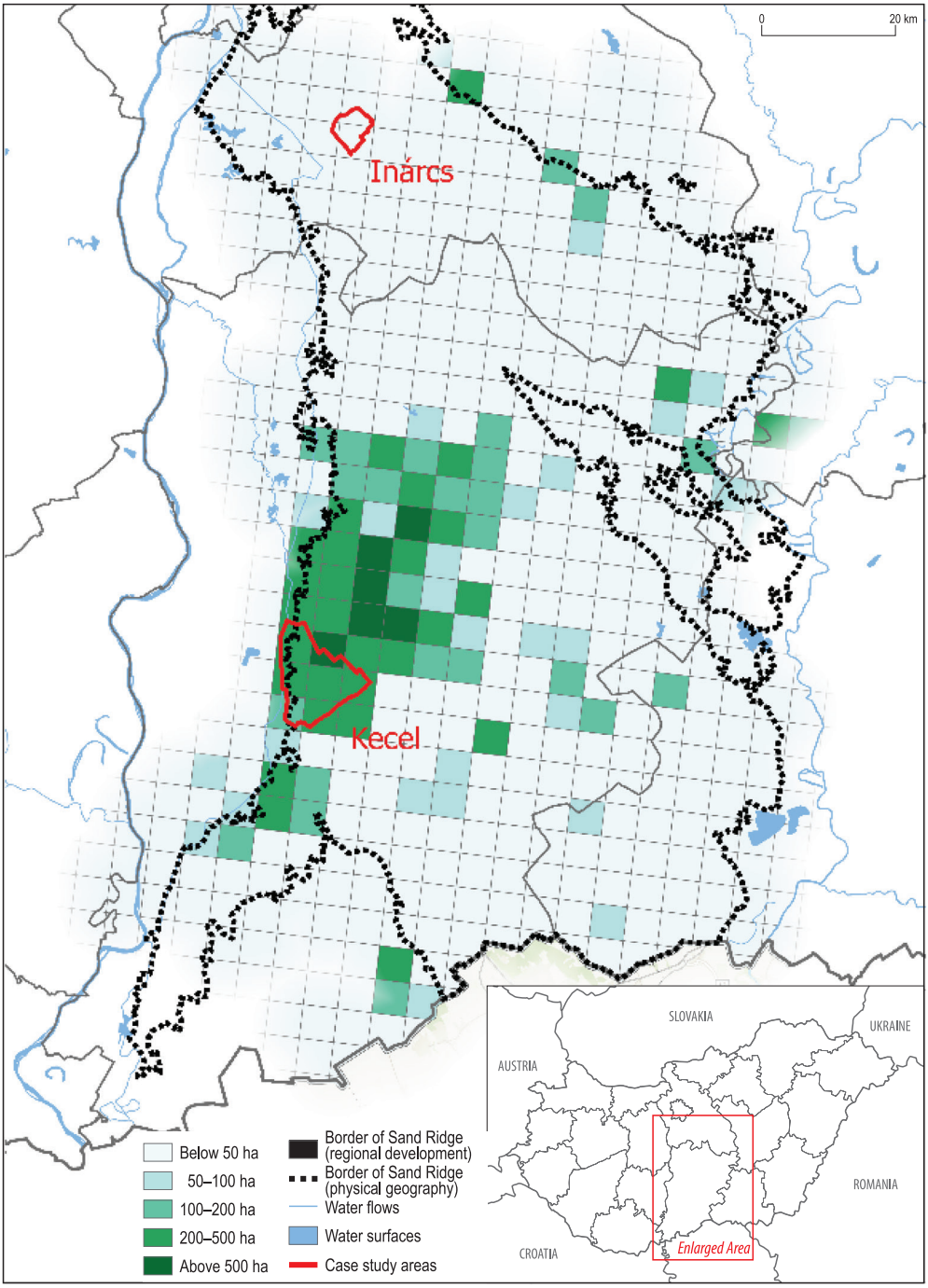

Fig. 5. Grape production in the Sand Ridge (in hectares). *Source:* Tagai, G. based on the Agricultural Census of 2020 downloaded from KSH TIMEA.

Kecel had increased significantly (Benyák, F. 2021). The case of Lajos Tolnay, a prominent figure in the Hungarian Royal State Railways, illustrates how infrastructural development and capital investment intersected spatially: his acquisition of extensive landholdings in Inárcs was closely tied to the expansion of the railway network, embedding the region within broader circuits of exchange[9]. In this way, local wine production became integrated into the global economy, mediated largely through jewish merchant networks. From the perspective of uneven development, these processes highlight how ecological crises such as phylloxera do not produce uniform decline, but rather reconfigure landscapes by concentrating investment and growth in specific locations while marginalizing others. However, this integration remained historically contingent. Following World War II, attempts to restore export-oriented intensive grape and fruit production were constrained by the reorganization of Hungary's political economy, as integration into the Soviet sphere reshaped the conditions of production and exchange (Rigó, R. 2023, 45). Thus, the region's trajectory reflects the cyclical and spatially uneven dynamics of capitalist development emphasized by Neil Smith (2008).

Following World War II, Hungary got integrated to the global economy through the Soviet Union (Gál, I. *et al.* 2021). Consequently, 1945 brought the reorganization of agriculture through land redistribution and forced collectivization. The existence and agency of the prevailing peasantry of Kecel during the period of state-socialist forced collectivisation achieved the establishment of a specialised cooperative (Szőlőfürt Szakszövetkezet, 1974) (Benyák, F. 2021). As a unique form of forced collectivization specific to the Sand Ridge, specialized cooperatives provided more autonomy for their members than producer cooperatives and allowed peasant farming to continue in a hidden form (Rigó, R. 2023, 45). From the mid-1970s, specialized cooperatives developed more dynamically in the region than production cooperatives, with revenue from the sale of products produced by smallholdings tripling between 1976 and 1984, with particularly significant growth in the sale of labour-intensive production, such as pork, poultry, fruit, vegetables, and wine (Romány, P. 1987).

In contrast to Kecel, apart from a small number of peasant landowners, the vast majority of the population of Inárcs were landless agricultural workers, in some cases without even a house or a place to live, thus, had a limited attachment to land (Czagányi, L. 1995, 15). Forced collectivisation went relatively easy in this settlement, resulting in the foundation of the region's first cooperative farm (Március 21 Termelőszövetkezet, established in 1958). All of Inárcs' agricultural properties have been consolidated into a single large farm nearly covering the entire village with 2,500–3,000 acres (Czagányi, L. 1995, 151)[10].

From the end of the 1960s, the improved economic performance of the cooperatives, both specialised and production cooperatives, was reached without large-scale infrastructural investments through the economic integration of backyard farming to global food systems through cooperatives (also characteristic in other parts of CEE during state-socialism, see Jehlička, P. *et al.* 2020). In exchange of a financial incentive the farm and village population was willing to use their existing stables, barns, grain stores, vineyards, cellars and the equipment necessary for grape processing, as well as their expertise and diligence on their own

[9] Lajos Tolnay, the first president and director of the Hungarian Royal State Railways bought 2,500 cadastral acre land in 1895 for wine production in upper Inárcs, close to the soon to be finished (in 1889) railway line (Czagányi, L. and Kulcsár, G. 1995).

[10] Beyond the Március 21 Cooperative Farm, the State Farm of Felsőbabád, covering approximately 450 acres, and the Inárcs Célgazdaság (Inárcs Target Farm) established on abandoned vineyards, covering approximately 90 acres also existed. A target farm is a specific state-owned or state-managed agricultural unit (state farm, collective farm) whose primary task is the high-quality production and propagation of a specific product, plant variety, or animal breed for experimental or breeding purposes.

backyard farmsteads for agricultural production (Rigó, R. 2023, 49). While income supplement through backyard farming was generated from intensive animal husbandry, such as poultry (I_02), cattle (I_03) and pig (I_03, I_04) and vegetable production (I_09) in Inárcs, backyard grape growing was the basis of additional income generation in Kecel. The Eastern Bloc provided an unlimited market for the agricultural products (mainly fruits, grapes/wine) of Kecel, bringing "unprecedented prosperity" to the people living there (Benyák, F. 2021). Grapes were typically grown within the framework of a state-owned farm in Inárcs (State Farm of Felsőbabád) on vineyards planted with state support between 1962 and 1963 (I_04 and Ganczaughné Albert, K. 1999, 682) and the Inárcs Target Farm in the system of sharecropping, but – partially due to the limited social embeddedness of grape production to the settlement – both agricultural facilities struggled with intensive grape production in the 1980s (I_01, I_04). While grape production lost its significance in Inárcs after 1989 in terms of the local economy and landscape, it is still a characteristic land use type in Kecel, one of the representative cities of the wine region (K_11, K_14, K_15, and see *Figure 5*).

Being integrated into global supply chains after 1989

During the transition period, the Eastern markets of domestic agriculture and food industry collapsed. It was challenging to find new markets, as the potential target countries of Hungarian agroexport also struggled with overproduction (Rigó, R. 2023, 52). Both the concentration of the retail sector (Nagy, E. and Nagy, G. 2020) and Hungary's European integration, which forced new member states of the EU to open their borders to import products, resulted in a decline of agricultural prices. Declining prices, increasing production costs along with processes of aridification reduced the profitability of agriculture in grape- (K_01, K_05, K_08, K_09, K_10, K_11), fruit- (K_01, K_04, K_05, I_01), vegetable production (I_05, I_07, I_08, I_12), arable farming (I_03), haymaking (I_03) and animal husbandry (K_02).

The global wine industry has undergone a fundamental transformation since the 2000s. In key production zones, principally Western Europe, there has been a reduction in the area dedicated to producing cheaper 'bulk' wines, as they have faced fierce competition from countries and regions such as China, Australia, Chile, South Africa and Oceania in export markets (Overton, J. and Murray, W.E. 2013, 704). However, Western European producers of premium bottled wines in higher price brackets have been active and successful in lobbying for the continuation and extension of laws recognising and protecting the geographical indications of their wines (Overton, J. and Murray, W.E. 2013, 704; Szamosköziné Kispál, G. 2018, 4). In Eastern Europe and countries such as Argentina and Chile, where long-established wine industries had focused on the local market with low-cost wines, many producers were unable to compete with imports after state protection ended (Overton, J. and Murray, W.E. 2013, 704). While both Western and Eastern Europe, including Hungary, has experienced a decrease in vineyard areas (Szamosköziné Kispál, G. 2018, 4), in the 'New World' (Australia, California and New Zealand), trade liberalisation opened up possibilities for expansion. The wine industries in these locations developed using modern industrial viticultural and winemaking techniques. This export-driven 'Fordist' approach to wine production enabled the production of high-quality wines in large quantities at a low cost, with little variation in style from one year to the next and a significant expansion of trade relations (Overton, J. and Murray, W.E. 2013, 704). Kecel within the Kunság wine region integrates to the global wine industry as a producer of cheaper 'bulk' wines. Its competitive advantage is based on the scale-efficient production of large quantities and sale on consignment (K_14, K_15). A fierce global competition is entered by wine producers of Kecel, through the intermediation of integrators:

"Now, when we negotiate with someone in the US or Canada, they say that they will bring this much from South America and New Zealand. New Zealand has the opposite climate, so it's winter here, and the harvest is just beginning there. So it's already clear how prices will develop on the world market. So if I see that there will be fewer grapes in New Zealand (...), then that information spreads around the world (influencing our business too)." (Grape integrator, K_14)

The integration into the global markets, of which the EU accession was a step pushed the price of grapes down, while the costs of production keep increasing:

"In 1999, so before 2000 (...) we sold a kilogram of Kékfrankos grapes for 100–110 HUF. (...) If you look at the 2023 price list, we're still at 100 HUF. (...) Now let's see what price increases there have been (on the production side) since then. Diesel is now, I don't know, 650 HUF, and back then it was around 120 HUF. That's six times as much." (K_11)

Productivist pressures push grape producers towards extractive practices in land use and employment: "The profitability of grape production is so low (...) I would say that we are practicing soil-robbing farming, because we don't have the money for it (nutrient replenishment)." (K_11) In terms of land use, the decline of animal husbandry in the region from the 2000s onwards prompted grape producers to switch from organic to artificial fertilizer (K_11).

In response to the labour shortage that has been growing since 2015, where possible, mechanization has been introduced (K_01, K_04, K_07, K_08, K_09, K_10, K_11, K_12, K_13, I_01, I_03, I_12) and where manual labour cannot be replaced, the work is done by the producers and their families (e.g. I_07, I_08) or by agricultural guest workers (e.g. from Romania, see I_01, I_06, K_10, K_03, K_06). Even if the price of grape did not rise significantly in the past decades, its market is considered more stable than for fruits (K_15).

In Inárcs, a significant proportion of farmers have now abandoned agricultural activities due to its low profitability (to which processes of aridification also contributed) and the emergence of land as investment (I_01, I_03, I_05, I_07, I_10, I_11). Land in the village is revalued through housing financialisation[11] (I_01, I_08, I_09, I_11), while in the outskirts it is revalued for renewable energy generation and industrial park development (I_01, I_02, I_09, I_10, Mihály, M. and Fabula, Sz. Forthcoming). Displacement of small-scale animal husbandry through housing financialisation and infrastructural development is remembered as follows:

"Well, in the end, the reason (for us to give up sheep farming) was that they (the municipality) started to divide up the Százholdas (for housing purposes), and then there was a plot of common land there partially belonging to my father, too. He asked for the edge of it, specifically for the animals to be driven in and out to the field. But then somehow the edge was given to someone else, and then they built the motorway, so grazing became impossible there." (I_07)

Under intensifying productivist pressures and declining profitability, smallholders are increasingly forced into a process of differentiation in which they must either expand or exit production (K_07, K_14, K_15). This dynamic contributes to the restructuring of the agrarian landscape in uneven ways: in Kecel, it manifests simultaneously in the spread of abandoned vineyards (K_11) and the growing concentration of land in the hands of larger grape producers (K_14, K_15). Such patterns reflect a broader tendency toward the consolidation of resources and the marginalization of less competitive actors. In Inárcs the emergence of land as investment manifests in the displacement of small-scale agricultural actors.

Climate change and aridification

Climate change results in higher mean annual temperatures, longer drought periods and a

[11] Housing financialisation is driven by liberal housing policies, such as the promotion of mortgage-backed home loans since the 2000s and subsidies encouraging new home construction, such as „szocpol", later CSOK (Family Home Creation Subsidy), which involves a high level (70%) of borrowing. Land in Inárcs got revalued through a surge in construction activity, driven by the „szocpol", later CSOK program introduced in early 2016, the reduced 5 percent VAT rate on new home construction in effect between 2016 and 2019, and the acceleration in mortgage lending (Gagyi, Á. *et al.* 2019, 221).

highly uneven precipitation in the Sand Ridge (Lennert, J. *et al.* 2024a, b; Interview E_07). There is less rainfall in spring and early summer, when it is most needed (Ferencz, Á. *et al.* 2019, 67). This means that irrigation periods are becoming longer, which leads to significant cost increases for farmers (Ferencz, Á. *et al.* 2019, 67) and groundwater loss for the region (Ladányi, Zs. 2010; Interview E_01). Increased evaporation in drought periods causes significant water loss in sandy soils (Interview E_02, E_01). Through their production practices (ploughing or disc harrowing, E_08, E_09, E_10) farmers exacerbate evaporation. Therefore both experts (E_09, E_10) and certain small (and large) scale farmers living in the Sand Ridge (E_08, K_16) are arguing for regenerative agriculture[12]. Regenerative agriculture is a widely accepted practice in the agroecology movement, applied mainly in arable crop production (Balázs, B. *et al.* 2020), also emerging in viticulture (Perniola, R. *et al.* 2024). It plays a key role in improving the structure of sandy soils, increasing their water-holding capacity, and building up their nutrient content, primarily by increasing their organic matter content and stimulating soil life (Balog, E. *et al.* 2025).

Extensive drought periods (such as those experienced in 2022, 2024 and 2025) put higher pressures on drought-tolerant plants. Grapes tolerate drought due to their Mediterranean origin and adaptable physiology, which includes developing deep root systems to access water. According to one of our grape producer and integrator interview partner:

"2024 was a watershed year, there has never been such a drought. (...) If it gets this dry again, only the old plantations will survive, planting new vines is risky." (K_15)

Atmospheric (or meteorological) drought occurs when a region experiences a prolonged period of below-average precipitation, such as rain or snow, compared to long-term averages. This deficit in rainfall, which can last for several months or more, is the first stage of drought and leads to reduced air humidity, increased average temperatures, and higher rates of evaporation and transpiration. Irrigation may be considered as a short-term solution in both cases of drought and atmospheric drought, but it contributes to further groundwater loss. In cases of grapes it encourages the development of a shallow root system that is less resistant to drought and highly dependent on continuous irrigation (K_15). Top watering may reduce the stress grapes are facing in times of atmospheric drought, but they also increase the risk of fungal growth (K_15).

Climate change has further weakened the position of Hungarian producers in the global market. It has resulted in an earlier and shorter grape harvest period (reduced from six-seven weeks to one month). As the air does not cool down at night before 20 August wine producers and integrators incur higher cooling costs (K_15). In 2024, grapes could be harvested from 1 August, making Hungary the first EU country to start harvesting, before prices had been set.

Earlier harvesting cannot be used as a competitive advantage in the fruit sector either. Even if processing plants could spread out the processing period, integrators would keep fruit prices low (K_11). Climate change (decreasing precipitation levels) and the liberalization of trade (Polish apple imports) have led to a decline in apple production in the Sand Ridge (K_11). Elderberry, as a more resistant, low-maintenance plant, replaced apple, but producers of Kecel are highly exposed to the volatility of its price in the global market.

"The price was around 600 HUF for elderberries (in 2020, during COVID), and now it's zero HUF, you could say. They said they started at 90 HUF on the

[12] Regenerative agriculture is a soil-restoring farming system that builds on natural processes to restore soil health, increase biodiversity, improve water management, and sequester atmospheric carbon dioxide. The term was coined in the United States by Robert Rodale, a pioneer of organic farming, in the 1980s and is recently gaining ground in Europe as well (Balogh, E. *et al.* 2025). The concept was introduced in Hungary by Attila Kökény (TMMG, https://www.tmmg.hu/) in 2010, and the interests of soil-regenerating farmers is represented by the Association of Soil-Regenerating Farmers (TMG, https://tmg.hu/) since 2018.

first day, then 80 HUF on the next day, and 70 HUF on the third day. (...) If elderberries are under 150 HUF, or under 100, then you should not even pick them. (...) It is picked (by migrant workers in vulnerable situations) for 50 HUF per kilo." (K_08)

Due to the challenges posed by climate change, especially the aridification of the Sand Ridge and the increased integration into global supply chains and the resulting loss in profitability of agricultural production, many farmers are giving up farming in both settlements, with less remaining in Inárcs. The financialisation of land (through rural gentrification and industrialization) makes it especially challenging for small-scale farmers of Inárcs to access land for food production.

Potentials for landscape regeneration and food system transformation

As the previous chapter showed integration to the current food system pushes "bulk" wine producers to keep extractive practices („soil-robbing farming"). If grape producers manage to position their wines as premium bottled wines in higher price brackets, like our interview partners in Hajós (neighbouring village of Kecel, E_11), they are able to ask extra prices for environmentally friendly (organic or natural wine production) or less exploitative labour practices. Cover crops among others, reduce evaporation, retain moisture in the soil and enable deep rainwater infiltration (Perniola, R. *et al.* 2024). However, it is important to schedule lawn mowing carefully, as the mulch may compete with young grape plants (E_11). Landscape variety fruit trees, such as sour cherry and peach, do not necessarily compete with grape plants and are also more resistant to arid conditions than their hybrid counterparts. Planting them in the grape lines may improve microclimate, reduce sunburn, filter light, and bring up water and nutrients from the soil (E_11). One of the most common white grape varieties of Hungary, *vitis vinifera* ("Olaszrizling" in Hungarian), also highly demanded on the market, arrived in Hungary from France in the mid-19th century to replace the vines that were destroyed during the great phylloxera epidemic. This water-intensive variety grows little foliage and small vines in the Sand Ridge. Balkan varieties ("Kövidinka"), a late-ripening white grape variety, probably native to the Carpathian Basin and "Kadarka", an extremely undemanding, hardy variety, whose roots grow strongly even in poor soil) are more traditional in the region and are more drought-tolerant. Climate change does not favour organic plant protection either, as many of the oils and teas burn the grapes above 25 ºC (E_11).

Based on our interviews we can state that food system transformation is quite challenging from the margins. After losing Eastern markets many of the small-scale farmers got engaged with the full vertical of wine production and sold wine made from their own grapes directly to the consumers. In the process of Hungary's EU accession, its wine legislation had to be made compatible with EU legislation, i.e. equivalent to Community law (Csoma, Zs. 2012, 67). This was also necessary because the wine sector is heavily export-oriented. As a result of the European legal harmonization the wine excise tax law came into effect on 1 August, 2000. The tax sparked many legitimate objections and protests, as it made small-scale production of grapes and the direct sales of own wines impossible:

"The problem was not with the regulation itself, but with the administrative burden it placed on farmers, which made it almost impossible for them to operate. We managed to do this for a few years, but I can say that this constant harassment and intimidation was too much for us to bear. (...) They (Lawmaking) lumped us together with wine counterfeiters, large factories, and others. So, in essence, this is the end of the vertical structure that was created through the diligence of the people here." (K_11)

The official representative bodies of small-scale grape producers (such as local wine councils, which were established in 1894, discontinued after 1949 and reorganized after 1994) were not able to represent their interest and apart from fragmented resistance

small-scale farmers could not make decision-makers to integrate their interest better into lawmaking.

The farmers in Kecel are familiar with initiatives that shorten the food supply chain, but they find it challenging to integrate into basket communities and other organised direct sales projects of civil society (K_11, Sociodrama_Kecel). Members of the food sovereignty and alternative food network movements need to develop a better understanding of the constraints faced by small-scale farmers hindering the transition of their products from the global to regional and local economies.

Even though the current food system disempowers them, small-scale farmers have an agency in regenerating landscapes and relocalizing food systems. In order for agroecologically-minded practices to survive, alternative trading channels must be developed so that the aim of landscape regeneration does not take precedence over the right to quality food for lower classes.

Conclusions

Laying the foundation of our analysis on the dialectics of world ecology and world economy we aimed to show how the current climate vulnerability of the Sand Ridge is not only caused by seemingly "external" processes of climate change, but by "internal" processes of agricultural production which is interlinked with the world economy through trade. We pointed out in our analysis how agricultural landscapes have been produced through trade relations integrated into the world economy embedded into processes of uneven development and how that increased the recent vulnerability of these landscapes. The production of arable land through drainage, the marginalization of pasturing as a livelihood system and large-scale afforestation all contribute to the aridification of the Sand Ridge. Both the Europe-wide historic drought of 2022 and the more severe, less-known regional droughts of 2024 and 2025 pointed out the climate-vulnerability of the Sand Ridge and urged the radical transformation of agriculture. Agricultural utilization of these sensitive areas should be based on sustainable landscape management. Heterogeneity of the soil and mosaic pattern of landscapes are not favourable for intensive, large-scale farming from the point of view of sustainability. It is not enough to involve farming models based on the utilization of drought resistant crops but it is essential to merge water retention with an agriculture adaptive to the landscape into a complex (Szilágyi, Zs. 2020) and resilient system, such as pastoralism, a traditional livelihood system in the Sand Ridge, marginalized by industrial agriculture (Mendly, D. *et al.* Forthcoming).

We also aimed to grasp the lived experiences of farming under profound landscape transformation. Both the marginalization of small-scale farmers within the food system embedded into the processes of uneven development and the ecological crisis resulting in the ongoing aridification of the region which is partially exacerbated by the production of nature for the purposes of intensive agriculture make farming in the Sand Ridge precarious and highly stressful.

Beyond their vulnerabilities we look at the agency of farmers in regenerating the landscape through building regionally more embedded food system alternatives. Our results show that the "bulk" production of cheap wine limits the scope for regenerative agriculture. Regenerative agricultural strategies can only be paid for if grape producers manage to position their wines as premium bottled wines in higher price brackets, but in this case the challenge of a two-class food system need to be tackled (Trauger, A. 2022). In terms of building food system alternatives, small-scale farmers of Kecel managed to develop direct sales after the regime change and the loss of Eastern markets, but as their resistance was fragmented lawmaking linked to European integration disabled this practice with the wine excise tax law. It remains a task for food sovereignty struggles to link remaining small-scale farmers and pastoralists of the Sand Ridge to consumers and to strengthen their voice in decision-making.

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Appendix 1

Interview code		Interviewee's profile	Date	Length (min.)	Status
1.	E_01	Expert on the geography of the Sand Ridge with a focus on groundwater level decrease, University of Szeged.	18.05.2023	90	transcribed
2.	E_02	Water management expert from the Southern part of the Sand Ridge.	20.06.2023	73	transcribed
3.	E_03	Expert on the ecology of the Sand Ridge, with a focus on forest steppe rehabilitation and ecovoltaics, University of Szeged.	13.12.2024	88	transcribed
4.	E_04	Expert on the geography of the Sand Ridge, with a focus on land use transformation, KRTK, Kecskemét.	09.12.2024	89	transcribed
5.	E_05	Expert on the historical political ecology of the Sand Ridge, University of Nottingham.	11.04.2025	81	transcribed
6.	E_06	Leader of a civil society organization fighting for small-scale farmers' rights. The interviewee also runs a farmstead in the Sand Ridge, where the groundwater level is 9–10 m deep.	24.04.2025	54	transcribed
7.	E_07	Expert on the geography of the Sand Ridge with a focus on aridification, KRTK, Kecskemét.	28.04.2025	57	transcribed
8.	E_08	Expert on regenerative agriculture at the Farmers' Association for Regenerative Agriculture (TMG).	12.05.2025	120	transcribed
9.	E_09	Expert on regenerative agriculture at the Hungarian Research Institute of Organic Agriculture (ÖMKi).	17.06.2025	107	transcribed
10.	E_10	Expert on organic farming at MATE.	04.09.2025	45	transcribed
11.	E_11	A focus group interview in Hajós (a neighbouring village of Kecel) including a local forester, a nature conservation ranger and a natural winemaker.	04.04.2025.	240	transcribed
12.	K_01	Large scale farmer in Kecel, male, engaged in grape and fruit production, age: 80+	30.09.2023	158	transcribed
13.	K_02	Large scale farmer in Kecel, female, engaged in poultry production, age: 40+	30.09.2023	53	transcribed
14.	K_03	Seasonal worker with migration background (born in Romania), male, Kecel.	30.09.2023	60	transcribed
15.	K_04	Small-scale farmer, female, Kecel, engaged in fruit production, age: 60+	21.10.2023	83	transcribed
16.	K_05	Small-scale farmer, female, Kecel, engaged in grape and fruit production, age: 40+	21.10.2023	71	transcribed
17.	K_06	Seasonal worker with migration background (born in Romania), female, Kecel.	21.10.2023	55	transcribed
18.	K_07	Integrator, Kecel, fruit sector.	07.11.2023	60	notes, did not consent to audio recording
19.	K_08	Small-scale farmers, wife and husband, engaged in grape production in Kecel, age: both 65+	07.11.2023	76	transcribed

20.	K_09	Small-scale farmer, female, engaged in grape production, her husband works full time in the vinery, she has a full-time position, age: 50+	07.11.2023	78	transcribed
21.	K_10	Small-scale farmers, wife and husband, Kecel, age: both 60+	08.11.2023	93	transcribed
22.	K_11	Small-scale farmer, female, university-educated grape grower, technical advisor in addition to grape growing.	08.11.2023	59	transcribed
23.	K_12	Seasonal worker, age 50+, agricultural machine operator.	11.11.2023	54	transcribed
24.	K_13	Seasonal worker, age 30+, agricultural machine operator, but has land too together with his father where they produce fruit.	11.11.2023	84	transcribed
25.	K_14	Integrator, Kecel, grape, sells wine in the global market	14.02.2025	55	transcribed
26.	K_15	Integrator, Kecel, grape, sells wine in the global market.	14.02.2025	90	notes, did not consent to audio recording
27.	K_16	Small-scale farmer (male, 45+) of Kecel engaged in water retention and food self-provisioning.	01.09.2025	74	transcribed
28.	Sociodrama_ Kecel	A sociodrama workshop organized with ten farmers from Kecel.	21.02.2025	300	notes
29.	I_01	The ex-leader of a former socialist agricultural cooperative, one of the leaders of a successor organization of the former agricultural cooperative, age 75+	24.05.2024 28.05.2024	233	transcribed
30.	I_02	Local community organizer, member of the representative body within the municipality of Inárcs, age: 65+	24.05.2024 03.06.2024 16.07.2024	220	transcribed
31.	I_03	Small-scale farmers, husband and wife, 10 ha arable land +5 ha meadow, age: 65+, both.	30.05.2024	280	notes
32.	I_04	Agricultural worker between 1960–1998, was engaged in backyard farming and grape and fruit production at the local agricultural cooperative, age: 75+	04.06.2025	60	transcribed
33.	I_05	Small-scale farmers engaged in vegetable production, father and son, age 80+ and 50+	05.06.2024	180	transcribed
34.	I_06	Seasonal workers with migration background (ethnic Hungarians, born in Romania) organized migrant seasonal workers for the successor organization of the former agricultural cooperative (fruit sector). They also produce strawberries on 0,5 ha land, age: 30+, both.	09.06.2024	78	transcribed
35.	I_07	Small-scale farmer, female, Inárcs, engaged in greenhouse vegetable production, age: 60+	24.06.2024	64	transcribed
36.	I_08	Small-scale farmer, engaged in potato and flower production. Age: 60+	04.07.2024	90	notes
37.	I_09	Small-scale farmer, male, grew vegetables on a small-scale between 1980 and 1990, was a member of ÁFÉSZ (Hungarian Agricultural Producers' Association) and also sold his produce at markets. Another former ÁFÉSZ member (female, age: 70+) was also present at the interview.	23.07.2024	90	transcribed

38.	I_10	Former local leader, was responsible for agriculture and land affairs after 1989, age: 75+	06.08.2024	168	transcribed
39.	I_11	Former local leader, member of the Local Heritage Committee, where he focuses on the agricultural history of the village, age: 75+	23.08.2024	127	transcribed
40.	I_12	Vegetable producer in the neighbouring settlement of Inárcs, the Solar Park of Inárcs and the high-voltage overhead cable limits the cultivation technology options that have been used in vegetable production, age: 60+	11.10.2024	125	transcribed
41.	I_13	Small-scale farmer, engaged in husbandry and feed production through arable farming, the high voltage overhead cable passes through his land, age: 50+	11.10.2024	55	transcribed
42.	Focus group_ walk along_ Inárcs	A focus group, walk along interview with three small-scale farmers (female), stakeholders of the solar power plant project in Inárcs.	26.07.2024	240	transcribed

Source: Authors' own compilation.

Appendix 2

The main concepts of the study and their relation to the interview codes

Main concepts	Codes	Examples: Interview excerpts
Agricultural production / Production of nature and Uneven development	Extreme weather events (e.g. drought, spring frost); Accelerating crop growth, reducing development time; De-/Re-valuation and transformation of agricultural land (e.g. solar farms).	*"2024 was a watershed year, there has never been such a drought. (...) If it gets this dry again, only the old plantations will survive, planting new vines is risky." (K_15)*
Agricultural production / Everyday life	Declining profitability; Increasing costs (e.g. energy, fertilizers, water); Farmers abandon agriculture; Alternative practices (e.g. irrigation, mechanisation); Regulation and subsidies (EU, national); Self-organisation and resistance is sporadic, random, and largely local in scale.	*"In 1999, so before 2000 (...) we sold a kilo of Kékfrankos grapes for 100–110 HUF. (...) If you look at the 2023 price list, we're still at 100 HUF. (...) Now let's see what price increases there have been (on the production side) since then. Diesel is now, I don't know, 650 HUF, and back then it was around 120 HUF. That's six times as much." (K_11)*

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Characteristics and courses of uneven development in Central and Eastern Europe: The evolution of places of underdevelopment

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Abstract

There are many quantitative analyses focusing on regional differences in Europe including Central and Eastern Europe (CEE). However, while in the West, there are running discussions on theories of uneven development aiming at understanding causes of inequalities, analyses from CEE are scarcely linked to these theoretical debates. The aim of this paper is to join the discussions on uneven development by exploring statistically measurable characteristics, driving forces and courses of it. A quantitative analysis grounded in a political economy approach methodologically and the uneven development framework theoretically is presented with a focus on the evolution of spaces and places of underdevelopment. The comparative analysis covers countries of CEE and situates the findings within the broader context of uneven development on the European semi-periphery. The article demonstrates how uneven development provides a powerful framework for understanding regional inequalities in CEE. The results indicate spatial differentiation since the early 1990s, characterized by simultaneous processes of equalization and differentiation across geographic space. The findings suggest that these inequalities are not temporary or accidental, but rather reflect an inherent mode of operation of capitalist development in the region.

Keywords: uneven development, Central and Eastern Europe, underdevelopment, convergence and divergence, regional differentiation

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Uneven development in Central and Eastern Europe

Since the concept of uneven and combined development was first articulated by Leon Trotsky in *History of the Russian Revolution* (2008 [1930]), scholars have built on this idea to examine disparities in economic and spatial development. Neil Smith's seminal framework of uneven development (2010 [1984]) extends Trotsky's insights by focusing on the geographical and structural dimensions of inequality, particularly within urban and regional contexts. Smith, N. emphasizes how capitalist processes shape the unequal distribution of resources, wealth, and development across different places, highlighting the spatial consequences of broader economic dynamics.

Uneven development is understood as an immanent part of capitalism, the engine behind economic growth or relapse (Walker, R. 1978; Hadjimichalis, C. 1986; Christophers, B. 2009; Harvey, D. 2018 [1982]). It "broadly defined as the relationships between places that (re)produce inequalities in wealth, power and resources" (Jones, M. *et al*. 2022, 1392). Uneven development is a continually evolving analytical perspective on socio-spatial processes. It emerges from the Marxist geographical tradition of the 1970s and 1980s and critically responds to the neoclassical economic assumption that inequalities represent only a temporary phase of capitalist development and can be eliminated through economic growth.

Our research examines capitalist economic development not as a progress which ulti-

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mately leads to the abolishment of underdevelopment but something that creates both spatial equalization and differentiation. During this process capital fluctuates in space, creating places of development and underdevelopment (Dunford, M. 1996; Dunford, M. and Smith, A. 2000; Smith, N. 2010 [1984]). The aim of this paper is to analyse the evolution of regional economic inequalities in Central and Eastern Europe (CEE) on the NUTS3 level over the past three decades through the theoretical lens of uneven development, with a particular focus on identifying and interpreting the emergence, persistence, and transformation of places of underdevelopment. Such analysis may provide a wider contextual framework to studies focusing on the lived experiences of uneven development (such as Berki, M. and Sági, M. 2026; Mihály, M. and Fabula, Sz. 2026; Timár, J. and Trócsányi, A. 2026 in this issue).

To date, few empirical studies focusing on CEE use the concept of uneven (and combined) development in a critical sense. Most apply the term merely to describe regional economic differences. As a result, its potential for deeper analysis is often overlooked, leaving empirical research on the region through this lens relatively underexplored.

Although capitalism has integrated Europe – and the global economy more broadly – into a single productive system, this system is internally differentiated and composed of multiple, historically specific combinations. These combinations are shaped by the institutional foundations of capitalism, including states, capital and labour, as well as by political and cultural relations and civil society. Hardy, J. (2014) argues that the development of CEE over the past three decades is threefold: (1) combined, as the post-socialist transition must be understood in relation to global economic processes; (2) compressed, as development has unfolded through rapid, non-linear shifts rather than gradual progression; and (3) uneven, as national and regional trajectories have diverged markedly depending on historical and structural conditions.

This paper draws inspiration from Dunford, M. and Smith, A. (2000), who analyse regional development in Europe using a small set of well-chosen statistical variables, with particular focus on 'falling behind' and 'catching up' regions. They highlight Marxist economic geography's "long-term emphasis on capitalist uneven development" as a key force behind the unequal distribution of economic wealth and the complex mosaic of territorial development (Dunford, M. and Smith, A. 2000, 171). Similarly, we employ a set of variables and methods well established in political economy, while paying particular attention to interpreting our results within the framework of uneven development, with a focus on simultaneous territorial equalization and differentiation.

A gap in research? Empirical applications of uneven development

An overview of the literature was conducted to gain an initial insight into empirical applications of uneven development. This brief review serves as a preliminary exploration to identify key themes, areas of focus, and the extent to which studies engage with the framework. The selected works were drawn from a search of the Clarivate Web of Science database and consist mainly of quantitative studies. A common feature is their reliance on case studies, ranging from local to supranational scales. The articles range from merely mentioning uneven development to a small number of studies that critically engage with the concept. Our primary focus was to find works on Central and Eastern Europe and/or (post-)socialist contexts, but a few studies with broader geographical scopes were included as well.

Analyses employing the concept of uneven development tend to follow two broad approaches. One consists of studies grounded in political economy and/or economic geography that remain largely descriptive and engage weakly with the critical implications of the framework. In these works, uneven

development is used to label spatial disparities rather than to explain them as inherent outcomes of capitalist development.

Related research addresses foreign direct investment (FDI), economic dependency, employment, and productivity in relation to regional inequalities. Adrian Smith (1994) examines dependent regional development in Slovakia's armaments industry and later links existing disparities to intensified territorial inequalities following EU expansion (Smith, A. 2003). Similarly, Pavlínek analyses Slovakia and FDI-related inequalities, linkages, and spill-overs, and their regional effects in the automotive industry (Pavlínek, P. 2004, 2018, 2022).

Research on FDI is central in economic geography: Jacobs, A.J. (2017) highlights its role in shaping path-dependent urban development, while Sokol, M. (2001) frames CEE as a Western 'super-periphery'. Cutrini, E. (2019) similarly identifies regional convergence clubs based on income levels.

In the context of Hungary, Martin, R. (2008) explains unequal post-socialist development through quantitative economic factors, without engaging the uneven development framework. By contrast, Gál, Z. and Lux, G. (2022) argue that FDI dependency and foreign bank dominance reinforce uneven development and external dependency, while also noting alternative paths and links to anti-EU sentiment. The other approach emerges from Marxist geography, where uneven development is understood as a fundamental concept – dynamic in nature yet widely accepted. Inequalities in CEE or the Global South are interpreted not as legacies of socialism or colonial past, but as inherent to capitalism – an outcome of Western economic domination and exploitation of these regions (Hardy, J. 2014). Hickel, J. *et al*. (2022) show how advanced economies benefit from appropriating labour and resources from the Global South via unequal exchange, generating social and environmental harm. Martinus, K. (2018) links productivity and competitiveness to regional disparities in resource peripheries, highlighting capitalism's role in shaping inequality and criticizing centralized regional policy. Lim, K.F. (2014) uses uneven development to explain China's hybrid position as a neoliberal global actor with socialist domestic principles. By problematizing the relationship and dynamics between state socialism and neoliberal capitalism and utilizing the concept of hybridity, Golubchikov, O. *et al.* (2014) explore the historical roots of inequality in CEE as inherited spaces for capitalist development, as well as the region's ongoing transformation through capitalist processes. We argue that uneven development reflects structural spatial inequalities of capitalism rather than a simple divide between "more" or "less" capitalist regions (Golubchikov, O. *et al*. 2014).

Our research is positioned at the intersection of these research traditions. Our methods and variable selection are grounded in political economy and regional studies. However, we apply the uneven development framework to interpret our results. While neither our theoretical approach nor our methods are new per se, their combination, together with our focus on CEE, enables a novel exploration of an under-examined research area. We challenge conventional notions of regional economic catching-up through deeper integration into capitalism, instead focusing on how structural regional inequalities in CEE have simultaneously equalized and differentiated over the past 30 years.

Research design

This research uses basic economic indicators and inequality measures to provide an overview of spatial differentiation processes in Central and Eastern Europe. This thematic focus builds on a well-established tradition in geographical and regional research (Paul, L. 1995; Downes, R. 1996; Dunford, M. and Smith, A. 2000; Heidenreich, M. 2003; Gorzelak, G. 2009; Smętkowski, M. and Wójcik, P. 2012; Benedek, J. and Moldovan, A. 2015; Lang, T. 2015; Nagy, E. 2015; Scutariu, A. 2017; Gorzelak, G. and Smętkowski, M. 2020). Previous analyses have identified

several characteristic and now well-documented features of regional economic inequality in CEE, including a core-periphery divide, the dominance of capital regions in economic performance, East-West gradients both across the macro-region and within individual countries, and diverging development trajectories between rural and urban areas (Smętkowski, M. 2013; Abrhám, J. 2018; Chapman, S.A. and Meliciani, V. 2018; Dyba, W. *et al*. 2018; Peredy, Z. *et al*. 2022).

Considering these antecedents, the potential added value and the novelty of the current analysis is the introduction of the concept of uneven development to the interpretation of regional differentiation processes in CEE. The Smithian way of analysing and better understanding regional inequalities is not unprecedented in regional analyses with a political economic approach, but these are usually more focused on spatial and economic processes related to the Global South (Bond, P. and Ruiters, G. 2017; Ortiz, R. 2024), than supporting available knowledge on CEE regional differences. Using this concept in our investigation helps shift the focus away from static snapshots of high and low inequality towards the relational aspects of regional differentiation.

By examining spatial differentiation alongside the temporal dynamics of spatial change, our research seeks to highlight imbalances and inconsistencies in socio-spatial processes in CEE. This approach reflects a core insight from uneven development, according to which there is no absolute economic progress, as the movement of capital continually reproduces inequalities between territories. Such inequalities are therefore not conditions that can be fully overcome or equalized within capitalism (Smith, N. 2010 [1984]). Accordingly, geographical scale, spatial variation, and the trajectories of uneven development play a crucial role in understanding regional economic inequalities, since processes of equalization and spatial differentiation unfold differently across spatial levels – within and between countries – and over time, following the seesaw-like fluctuations of capital (Dunford, M. and Smith, A. 2000; Jones, J. *et al.* 2017).

In quantitative regional research analysing spatial and economic variation in a Central and Eastern European context, the focus is often placed on understanding processes of equalization and differentiation (Smith, A. and Timár, J. 2010; Monastiriotis, V. 2011; Smętkowski, M. and Wójcik, P. 2012; Benedek, J. and Moldovan, A. 2015; Kisiała, W. and Suszyńska, K. 2017; Holobiuc, A. 2021; Stawicki, M. and Wojewódzka-Wiewiórska, A. 2023; Egri, Z. and Lengyel, I. 2024). This study contributes to these efforts by examining spatial equalization and differentiation within the CEE macro-region, with particular attention to the relative positions of specific areas – especially spaces of underdevelopment (Dunford, M. 1996; Dunford, M. and Smith, A. 2000) – that may be persistently affected by fluctuations in regional inequalities.

In order to capture these aspects of regional differentiation, the analyses presented in this paper focus on the question of what convergence is directed towards. Accordingly, the following questions are addressed in relation to understanding the trajectories of uneven development in Central and Eastern Europe:

– How did the catching-up to former levels of regional economic performance happen after the political and economic transition period in CEE countries?
– How do processes of convergence and spatial differentiation at different spatial levels (national, EU) relate to each other?
– What kind of regional variances characterize inequality patterns and the fluctuation of differences within Central and Eastern European countries?

To provide a basic overview of processes of economic differentiation in CEE the analyses presented in this paper are based on GDP per capita at the NUTS 3 level, as a proxy for regional economic performance, and productivity and employment rates at the NUTS 3 level, as a proxy for the movement of capital. By capturing a highly complex phenomenon in a

simplified form, GDP per capita is commonly used as the dominant indicator in studies of regional economic disparities and equalization, but it has well-known limitations.

On the one hand, GDP reflects only the formal economy and does not account for broader dimensions of well-being – such as health, education, environmental quality, or governance (Harvie, D. *et al*. 2009; Dědeček, R. and Dudzich, V. 2022) – which are also shaped by capital movements. On the other hand, spatial biases (workplace-residence mismatch, scale sensitivity, focusing only average gaps regarding inequalities) may distort interpretations of spatial differentiation processes and their relationship to underlying economic realities (Tvrdoň, M. and Skokan, K. 2011; Stawicki, M. and Wojewódzka-Wiewiórska, A. 2023; Pietak, L. 2024).

By acknowledging the drawbacks of applying this measure in regional analyses, GDP per capita measures are, for the purposes of our investigation, considered adequate for (re)exploring basic patterns of spatial economic differentiation in CEE, given the multi-layered focus on regional inequalities and the cautious interpretation informed by the concept of uneven development (Dunford, M. and Smith, A. 2000).

To analyse capital mobility, we use productivity and employment rates as indirect proxies for capital movement (Dunford, M. and Smith, A. 2000). Increases in productivity may indicate the spatial movement of capital and its fixation in the built environment and means of production (e.g. infrastructure, machinery). Complementing this, the employment rates serves as an additional indirect proxy for investment and economic expansion. We assume, with caution, that rising employment may reflect capital investment through job creation. When productivity and employment increase together, this may suggest that previously mobile capital is being fixed through investment, generating new employment opportunities.

We acknowledge that more direct measures, such as foreign direct investment data, would provide stronger proxies for capital movement in CEE. Therefore, several limitations must be acknowledged in our approach. Increases in productivity may reflect capital investment in the means of production, but can also result from technological change, innovation, human capital development (e.g. skills and education), or efficiency gains, such as improved management practices. A similar caution applies to employment rates. Technological investments (e.g. automation) can alter employment structures independently of capital mobility. Changes in employment may indicate investment or disinvestment but can also reflect policy shifts. For example, declining employment rates in CEE after the transition were influenced by the elimination of hidden unemployment, while subsequent increases may be linked to government interventions, such as public works programs introduced in Hungary after 2010 (Csoba, J. 2010; Kóti, T. 2020; Vastagh, Z. 2017; Vidra, Zs. 2018). Despite these limitations, we argue that, when analysed together, productivity and employment remain useful proxies for examining capital mobility.

The source of the data is the ARDECO (Annual regional database of the European Commission's Directorate-General for regional and urban policy) Explorer, maintained by the Joint Research Centre [JRC] of the EU. The value of this database lies in the fact that (1) it provides various GDP-related indicators that are not available from other EU sources, (2) it offers long-term data, including information from before 2000, which was particularly useful for our research, and (3) successive changes in the NUTS system are addressed in the database, with all data available in the NUTS 2024 version.

From the ARDECO database, both GDP per capita at constant (2015) prices (ARDECO SOVGDP) and GDP per capita at current prices (ARDECO SUVGDP) were used, as well as productivity (ARDECO SUVGDE) and employment data (ARDECO SNETD). GDP at constant prices was calculated by the JRC using NUTS2- and country-level GDP growth rates from Eurostat. This measure was used to analyse the (self-)catching up of

CEE NUTS3 regions over time following the decline associated with the post-socialist economic transition, resulting from the regime change and the fully (re)introduced mode of capitalist economic production.

GDP per capita at current prices was measured and analysed in PPS (purchasing power standards) units. This measure was used in cases where the nominal GDP value itself was not of primary interest, but rather when annual regional values were compared with national averages or with the EU-27 average.

The territorial scope of the analysis was selected to focus on the eleven CEE member states of the European Union (BG, CZ, EE, HR, HU, LT, LV, PL, RO, SI, SK), while the spatial scale for analysing territorial differentiation processes was NUTS3. This level of detail is sufficient to uncover both country-level aspects, regional characteristics, and local specificities when these aspects are examined through the lens of the concept of uneven development.

The false hope for territorial equalization and the rise of inequalities

Economic crisis began in many socialist countries of Central and Eastern Europe in the 1970s and intensified with the transition to a capitalist market economy in the early 1990s. This process brought significant economic changes and contributed to the realignment of existing spatial structures. The shock of political change of regime and the full return to the capitalist mode of production led to a transformational recession (Kornai, J. 1994). At the same time, these processes also raised the hope of economic equalization (catching up to the Western European countries) and the mitigation of inequalities within national economies. Over the past three decades, these hopes have been dashed, and the idea of catching up give over to a reality of growing territorial inequalities within national economies.

Of course, on the macro-level Central and Eastern European economies are catching up to Western economies, and at lower regional levels (NUTS3) there are also numerous areas from CEE (and not just capital regions), which GDP per capita levels have already surpassed that of many other regions of Western economies. However, equalization is not a general process, and real economic progress is not very common. When speaking about equalization, it is worth noting what kind of catching up is the focus of attention. Considering the short-term effects of the transformational recession, before comparing Central and Eastern European regions to other countries, it is useful to examine when these regions regained their previous relative levels of economic production – a process also shaped by broader global economic shifts.

For this, GDP per capita data from the early 1990s to the present days is analysed. From the time series of GDP data at constant prices, those years are selected and mapped, in which the given NUTS3 unit first reached the GDP per capita value measured in the early 1990s (see *Figure 1*). This interval does not allow us to look back perfectly on the economic performance achieved under state socialism, but without comparable data available pre-1990, this measure is used for grasping regional variations in (self-)equalization in CEE.

According to other studies, Central and Eastern European countries needed about 3–9 years after the early-1990s transformational recession to get GDP per capita back to its late-1980s level due to the region-wide recession in the early 1990s, and a more intensive period of growth from the mid-1990s to the mid-2000s (Tiits, M. *et al.* 2008; Bilenko, Y. 2022; Woźniak-Jęchorek, B. 2024). Our analysis confirms these trends and also shows some variations between these countries. At the country level Slovakia or Poland avoided major per capita fall, but much of the other CEE countries have regained their pre-transition income levels by the mid-1990s. *Figure 1* shows that this process lasted until the 2000s in Romania and Lithuania, and even beyond 2010 in some regions of Bulgaria and Czechia.

Within country variations of the rate of these processes are significant. Where there

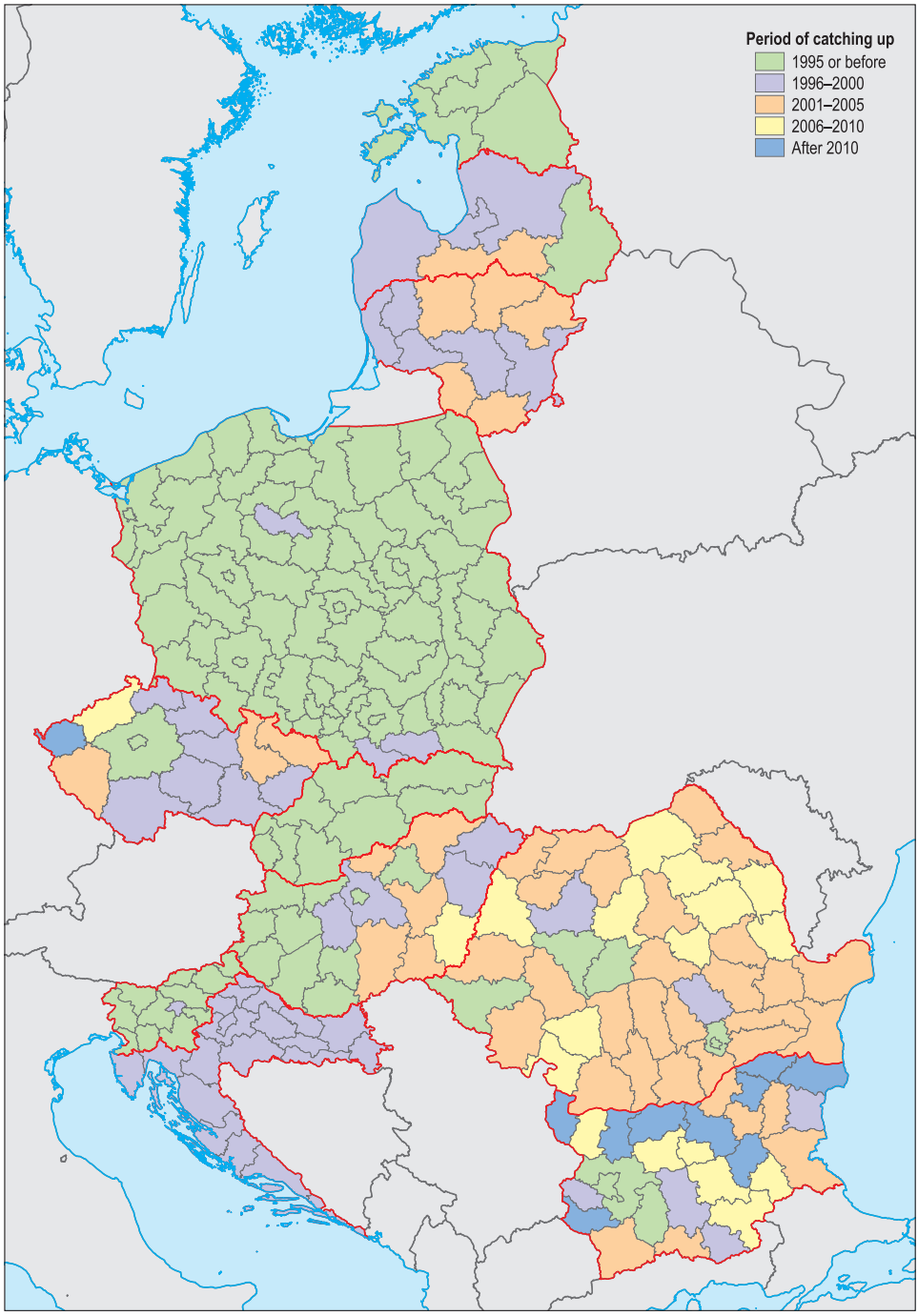

Fig. 1. When did CEE NUTS3 regions catch up to their early 1990s GDP/capita level in CEE countries? Reference years: 1990 – CZ, PL, RO; 1991 – BG, HU, SI; 1992 – LT, LV; 1993 –- EE, SK; 1995 – HR. *Source:* Elaborated by the authors using ARDECO Database, SOVGDP, GDP at constant (2015) prices.

was no unified progress observable, usually capital and other leading urban regions recovered much faster than rural or peripheral areas (Lang, T. 2015; Holobiuc, A. 2021; Egri, Z. and Lengyel, I. 2023; Egyed, I. and Zsibók, Zs. 2023). This can be observed in Czechia, Hungary and Romania, among other CEE countries (see *Figure 1*). The greatest lag in economic recovery characterizes peripheral areas of Czechia, Bulgaria and Romania, e.g. the majority of current Bulgarian NUTS3 regions only surpassed their pre-transition GDP level after the mid-2000s – the 2008 global economic crisis may further have prolonged the adjustment period. These groups of regions also indicate the first signs for identifying spaces of underdevelopment in CEE. This kind of interpretation of trends related to economic development processes from the early 1990s does not only reveal temporal inequalities in equalization but also highlights the dynamic rise of spatial differentiation as a sign of the systematic unevenness dominating capitalist development (Smith, N. 2010 [1984]).

Regional disparities and the spatial movement of capital

As previous findings show, although Central and Eastern European countries experienced strong overall equalization from the 1990s, within-country inequalities often widened until the past years (Tvrdoň, M. and Skokan, K. 2011; Benedek, J. and Moldovan, A. 2015; Kisiała, W. and Suszyńska, K. 2017; Lengyel, I. and Kotosz, B. 2018; Holobiuc, A. 2021; Peredy, Z. *et al.* 2022; Jankiewicz, M. 2025). These spatial patterns are followed by our paper too. Besides building on findings from previous studies, inequality measures are investigated by using productivity and employment rates at NUTS3 level to follow trends and characteristics of spatial movement of capital in the region.

The decomposition of GDP into productivity and employment factors appears in several studies. Dunford, M. and Smith, A. (2000) uses it to identify and describe the causes of uneven development, and to compare Western Europe with CEE to see how spatial equalization and differentiation operates. They argue that productivity differentials are affecting the investment potentials of capital, while employment rates shows the ability of economies to mobilize their human potential, labour. In Hungarian regional studies tradition Lengyel, I. (2003), and Nemes Nagy, J. (2004) employ the same method to define different types of regional competitiveness. However, the use of these indicators as proxies for capital movements is not commonly found in geographical literature.

Within the Marxist tradition, Duque Garcia, C.A. (2022) uses similar variables to conduct an econometric analysis of global employment and capital accumulation. The patterns identified are consistent with Marx's general ideas about accumulation processes in the capitalist system. The results show that "the level of employment tends to expand with the fixed capital stock but tends to contract with the growth in labour productivity" (Duque Garcia, C.A. 2022, 606). Following this line of reasoning, we argue – with major limitations – that mapping productivity and employment rates can provide a general indication of the spatial movement of capital and the regional disparities it generates.

Figure 2 visualizes NUTS3 regions according to their productivity and employment characteristics in 2023. Regions shown in green are in the most disadvantaged position, with both productivity and employment rates below the EU-27 average. A general trend is that many urban regions exhibit higher productivity with varying employment rates, while most capital regions display both higher productivity and higher employment levels than the EU-27 average. This can be explained by the greater employment capacity of capital areas, as well as differences in their ability to mobilize the workforce within their agglomerations. The relatively easier mobilization of labour in urban areas, together with generally higher wages, partly accounts for this stronger employment

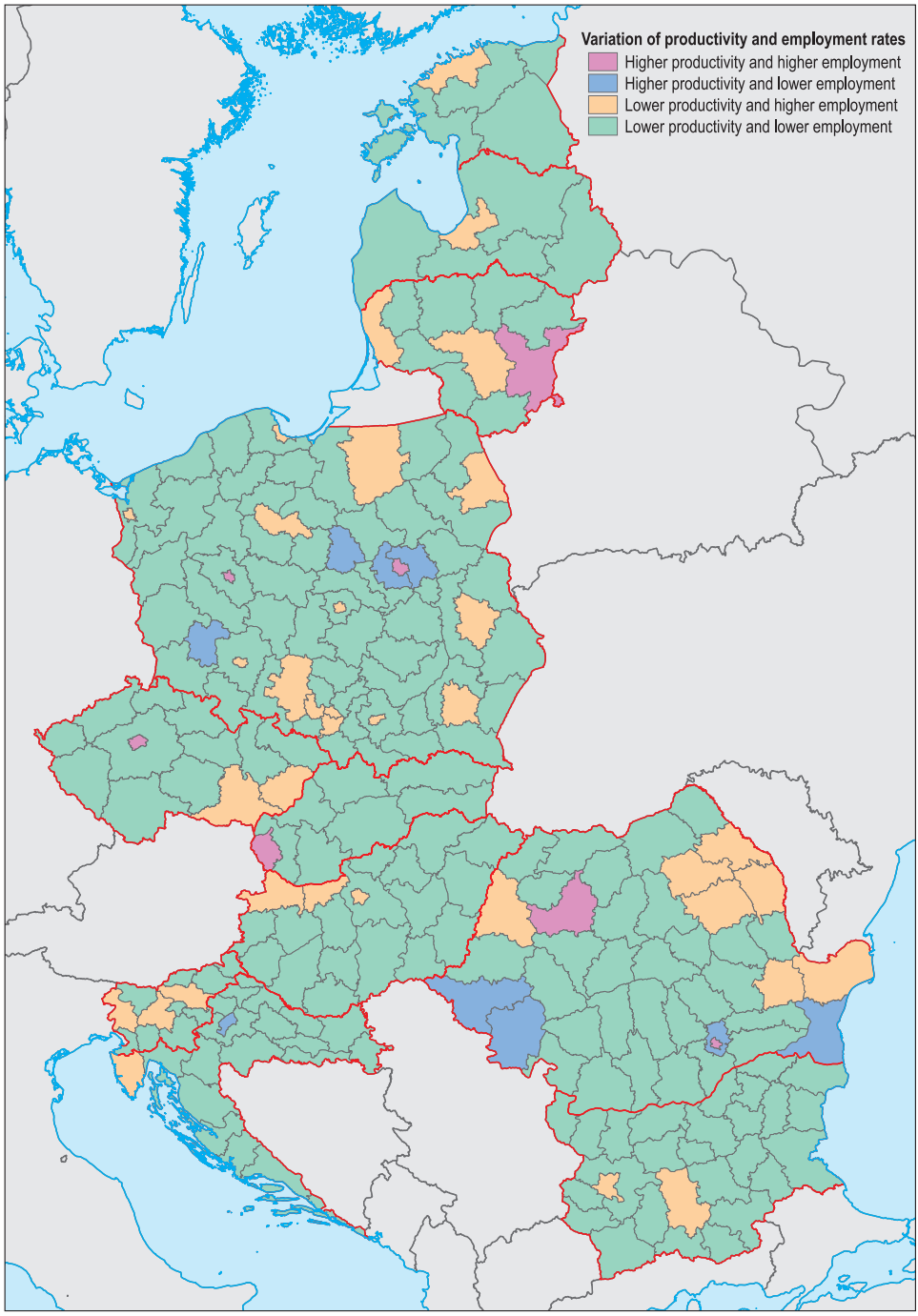

Fig. 2. Variation of productivity and employment rates in CEE NUTS3 regions in 2023 (compared to EU-27 average). *Source:* Elaborated by the authors using ARDECO Database, SUVGDE, labour productivity and SNETD workplace-based employment.

capacity. At the same time, the maps highlight that capital regions have emerged as new centres, while peripheral areas in CEE – often characterized by structurally unfavourable economies – are lagging behind both their own national centres and the EU.

Figure 3 illustrates temporal change in productivity and employment rates. In the dynamic centres of CEE countries, both productivity and employment increased following the economic transition. These regions are predominantly capital city regions and areas surrounding larger urban agglomerations. More generally, the most common trajectory is an increase in productivity accompanied by a decline in employment, which can be explained by the transition from a labour-intensive economic structure toward full integration into the capitalist system.

Regions with structurally unfavourable economies are those where productivity decreased over time despite rising employment. The most disadvantaged locations – referred to as "places of underdevelopment" – are regions that experienced declines in both productivity and employment between 1995 and 2023. By mapping directional change, we provide a basic indication of capital's spatial mobility and how it has favoured certain regions over others in time.

The significantly lower productivity levels of CEE regions have improved considerably over time, and the gap between CEE and the overall EU average has narrowed. By contrast, employment rates have declined in most areas from the 1990s to the present, consistent with the relationship outlined above. Two key observations emerge from the maps presented that connect to the broader argument of this paper. First, although productivity growth in many CEE regions may reflect an increased capacity to attract capital, it has not led to equalization, on the contrary, regional inequalities have often widened (Benedek, J. and Moldovan, A. 2015; Lengyel, I. and Kotosz, B. 2018; Jankiewicz, M. 2025). Second, those regions where both productivity and employment had declined by the 2020s largely coincide with areas that have lagged in terms of catching up to previous GDP levels and have shown little to no equalization toward the EU average over the past three decades. Taken together, these findings suggest that such regions can be characterized as places of underdevelopment. Capital has selectively mobilized labour and productive capacities in CEE, thereby reinforcing spatial differentiation (Massey, D. 1995).

Changing regional structures and the production of development and underdevelopment

Capital mobility acted as a driver in Central and Eastern Europe not just in affecting the degree of regional differentiation but also influencing the national composition of variation in economic production levels and position changes of regions within these countries. During the 1990s, both FDI-led restructuring and export orientation shaped regional patterns of economic inequalities by concentrating high-productivity activities in a few regions reinforcing within country differentiation. Besides EU cohesion policy measures also supported growth, on national level, but significant equalizing effects between regions cannot be observed as a result of these efforts (Bandelj, N. and Mahutga, M. 2010; Tvrdoň, M. and Skokan, K. 2011; Lengyel, I. and Kotosz, B. 2018; Egri, Z. and Lengyel, I. 2024).

To illustrate how the complex system of regional economic differentiation evolved in CEE and have changed over time due to the movement of capital, GDP per capita-based inequality measures in this study were supplemented by the identification and plotting the range and four characteristic values of analysed data sets: maximum, mean, median and minimum – all compared to the average EU-27 GDP per capita level for the given years.

The overall equalization process reflected in rising mean and median values may indicate genuine economic progress (*Figure 4*). However, this apparent progress is mislead-

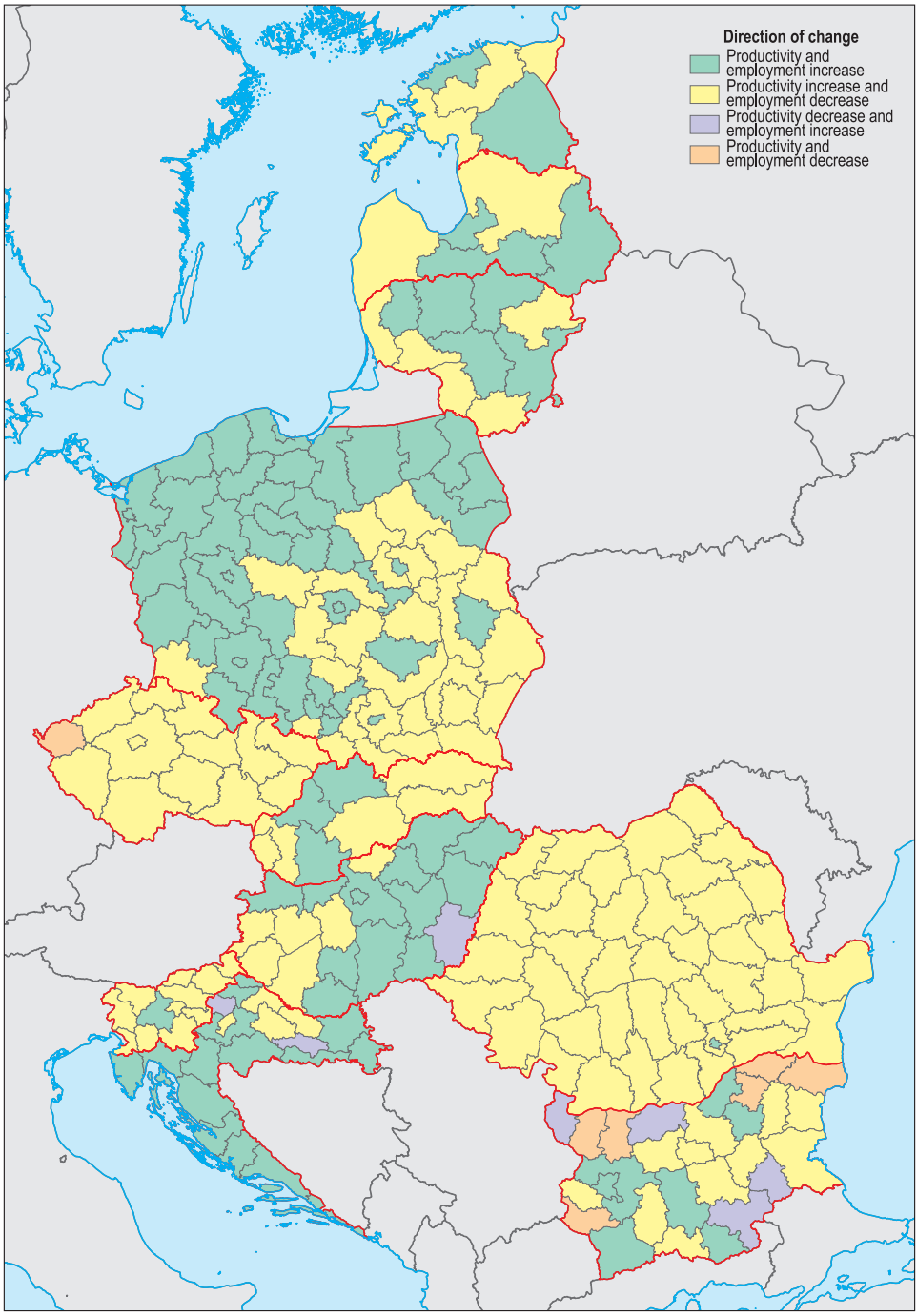

Fig. 3. Changes in productivity and employment rates in CEE NUTS3 regions between 1995 and 2023. *Source:* Elaborated by the authors using ARDECO Database, SUVGDE, labour productivity and SNETD workplace-based employment.

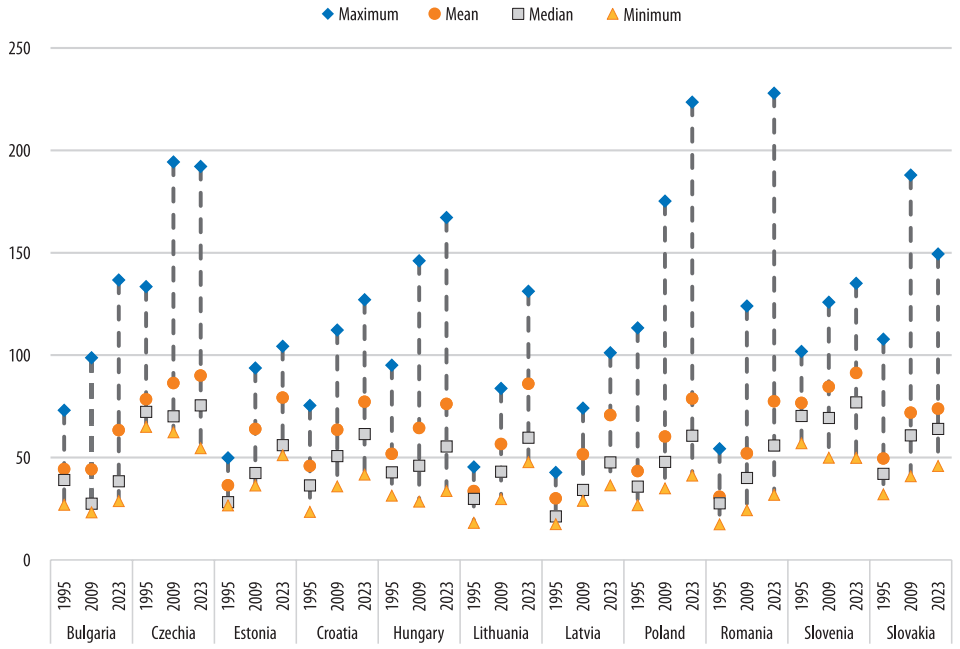

Fig. 4. Change of regional differences of per capita GDP in CEE countries at NUTS3 level, 1995–2023. *Source of data:* ARDECO Database, SUVGDP, GDP at current prices (PPS), adaptation of figure from Lang, T. (2015, 173).

ing if internal disparities are not considered. While relative macro-level equalization signals economic development, nevertheless, progress in certain spaces is accompanied by other regions being pushed to the periphery and becoming dependent on economic power relations (Smith, N. 2010 [1984]) This dynamic is reflected in the widening gap between minimum and maximum values, suggesting that equalization and differentiation occur simultaneously, in contrast to neoclassical economic claims of continuous convergence.

Considering the results of the current analysis this can be interpreted as follows. Growing ranges of plotted GDP per capita data sets grasp the increasing regional differentiation (Lang, T. 2015). Beneficiaries of these trends are usually capital city regions and other dynamic urban areas where economic growth has been fuelled by investments since the beginning of the 1990s. The growth of these regions pulled country averages up, indicating overall economic progress within these countries. The significant separation of these areas from the rest of the country based on economic performance characterizes the first half of the analysed period (until the mid-2000s). After the financial crisis of 2008 this dynamism of the core regions is not so striking, except for Romania with the fast rise of economic potentials of Bucharest. In a few cases, for instance Czechia or Slovakia, the relative decline of former positions can be observed in this period.

If not mean GDP per capita values but medians of data sets are considered, different conclusions can be drawn on territorial equalization in CEE. Besides the dynamic engines of these economies, the rest of the country, especially poorer, peripheral and rural areas often show only slow equalization, if any, instead strengthening peripheralization and underdevelopment tend to be more common (Chapman, S.A. and Meliciani, V. 2018;

Holobiuc, A. 2021; Egri, Z. and Lengyel, I. 2024). These characterize the regional differentiation in Bulgaria, Czechia, Hungary, or Slovenia. In these countries, usually the poorest NUTS3 units show no real economic progress (or even are in a decline).

In general, the widening of the gap between minimum and maximum values indicates ongoing differentiation, while the relative comovement of the mean, median, and minimum values suggests that (at the aggregated national level mainly) equalization is observable. This supports arguments that suggest regional restructuring simultaneously produces both advanced regions and spaces of underdevelopment (Dunford, M. and Smith, A. 2000; Smith, N. 2010 [1984]; Hardy, J. 2014).

Lag of the poorest NUTS3 areas and other less dynamic parts of CEE is also a characteristic of the capitalist system (Smith, N. 1982). The rapid integration of the Central and Eastern European region was in the fundamental interest of Western capitalist economies, as it provided access to additional markets, (consumer) demand and (cheap) labour. However, full equalization was not the goal, as cheap labour and cheap (for example) manufacturing industry statuses are more profitable than the full integration of CEE countries (Magnin, E. and Nenovsky, N. 2022).

Socialist structural legacies influenced how post-1990 restructuring unfolded and which regions developed at the expense of others. Hardy, J. (2014) notes that the initial inflow of foreign direct investment and transnational corporations' emergence in the region were key drivers of structural change. These investments tended to concentrate in areas where institutional and production infrastructure were already well established, reinforcing the development of (for example) capital regions while peripheral areas lagged behind. As a result, CEE became locked into a low-technology role, supplying raw materials and components to advanced economies (particularly Germany), with only a few innovation pockets capable of moving beyond this dependent position (Hardy, J. 2014). Another key factor shaping divergent regional pathways was whether former highly industrialized areas managed to preserve their economic functions in the post-transition period or collapsed following the end of centrally planned production. Since the structure of transition varied across countries – some workers were able to influence the restructuring of firms and privatization forms – this further contributed to both regional and cross-country differentiation (Hardy, J. 2014).

(Re)production of places of underdevelopment

This section focuses on the position of regions that are less dynamic or lagging among the NUTS3 regions of Central and Eastern Europe within the process of simultaneous regional equalization and differentiation. The previously explored imbalances are used to identify spaces of underdevelopment which are continuously avoided by movements of the capital during fluctuations of post-transition economic development in CEE. The regional economic performance of Central and Eastern European NUTS3 units is measured by GDP per capita data calculated in percentage of the EU-27 and national averages to make a distinction between initial levels of development of these regions in the early-to-mid-1990s. These classes are crosscut by indices of position changes over the analysed period by differentiating between growing and declining regions (*Table 1.*).

Comparing regional data to the EU-27 averages, again equalization can be observed. During the period analysed, most of the Central and Eastern European NUTS3 regions (even slightly) approached the EU-27 GDP per capita average. Nevertheless, there is a group of regions, usually with weaker economic performance capacities, which diverged from that. The national level patterns are more ambiguous. The great majority of Central and Eastern European regions faced differentiation over time from national GDP per capita averages, regardless of their initial economic performance positions. This is

*Table 1. National and EU-level convergence and divergence of CEE regions from the 1990s to 2023**

Position change between 1995 and 2023	GDP per capita level in 1995 in percentage of the EU-27 average			
	under 75	75–100	over 100	Total
Growing	207	8	4	219
Declining	18	1	–	19
Total	*225*	*9*	*4*	*238*

Position change between the early 1990s and 2023	GDP per capita level in early 1990s in percentage of the national average				
	under 75	75–100	101–125	over 125	Total
Growing	22	20	7	10	59
Declining	29	98	32	20	179
Total	*51*	*118*	*39*	*30*	*238*

*Region number in different groups. *Source*: ARDECO Database, SUVGDP, GDP at current prices (PPS).

also a sign of territorial differentiation due to uneven development within these countries, where only a smaller number of regions were able to keep or improve relative positions in national economic development.

The map of regions lagging behind, considering the EU-27 or the national averages, implies that these spaces do not necessarily coincide (*Figure 5*). Lagging regions in decline compared to the EU-27 average characterize regions from Bulgaria, Czechia or Slovenia. These are matching those spaces which are already suggested to be identified as underdeveloped regions in other parts of the current analyses with locked in development positions and delayed economic progress in absolute terms (see *Figure 1*). Lagging regions in decline compared to national averages usually represent peripheral areas of CEE countries both in terms of their spatial location and socio-economic characteristics.

The separation between spaces of underdevelopment compared to EU-27 and national averages shows that the levels of inquiry influences how territorial differentiation is understood, as well as reinforcing the spatially uneven nature of differentiation and the production of inequalities. *Figure 5* is a visual representation of the argument that differentiation and equalization happen simultaneously (Smith, N. 1982, 1992; Dunford, M. and Smith, A. 2000).

Concluding discussion

We set out to examine regional economic differentiation processes in Central and Eastern Europe through the theoretical lens of uneven development, with the aim of moving beyond neoclassical accounts of convergence and divergence and interpreting patterns as systemic outcomes of capitalist spatial dynamics. By analysing GDP per capita trajectories, inequality measures, and positional changes of NUTS3 regions since the early 1990s, the study demonstrates that the post-1990 economic development did not lead to generalized economic catch up to Western Europe or the mitigation of regional inequalities. Rather, a pattern of systematic unevenness was produced (Smith, N. 2010 [1984]), characterized by the simultaneous presence of differentiation and equalization, as well as by the emergence of persistent places of underdevelopment.

The empirical results support previous accounts on uneven development in CEE (Golubchikov, O. *et al.* 2014; Hardy, J. 2014), which argue that inequalities in the region should not be interpreted as transitional anomalies or as legacies of state socialism alone. Instead, the findings show that the change in the mode of production to capitalism in the early 1990s constituted a major spatial reorganization of economic activity.

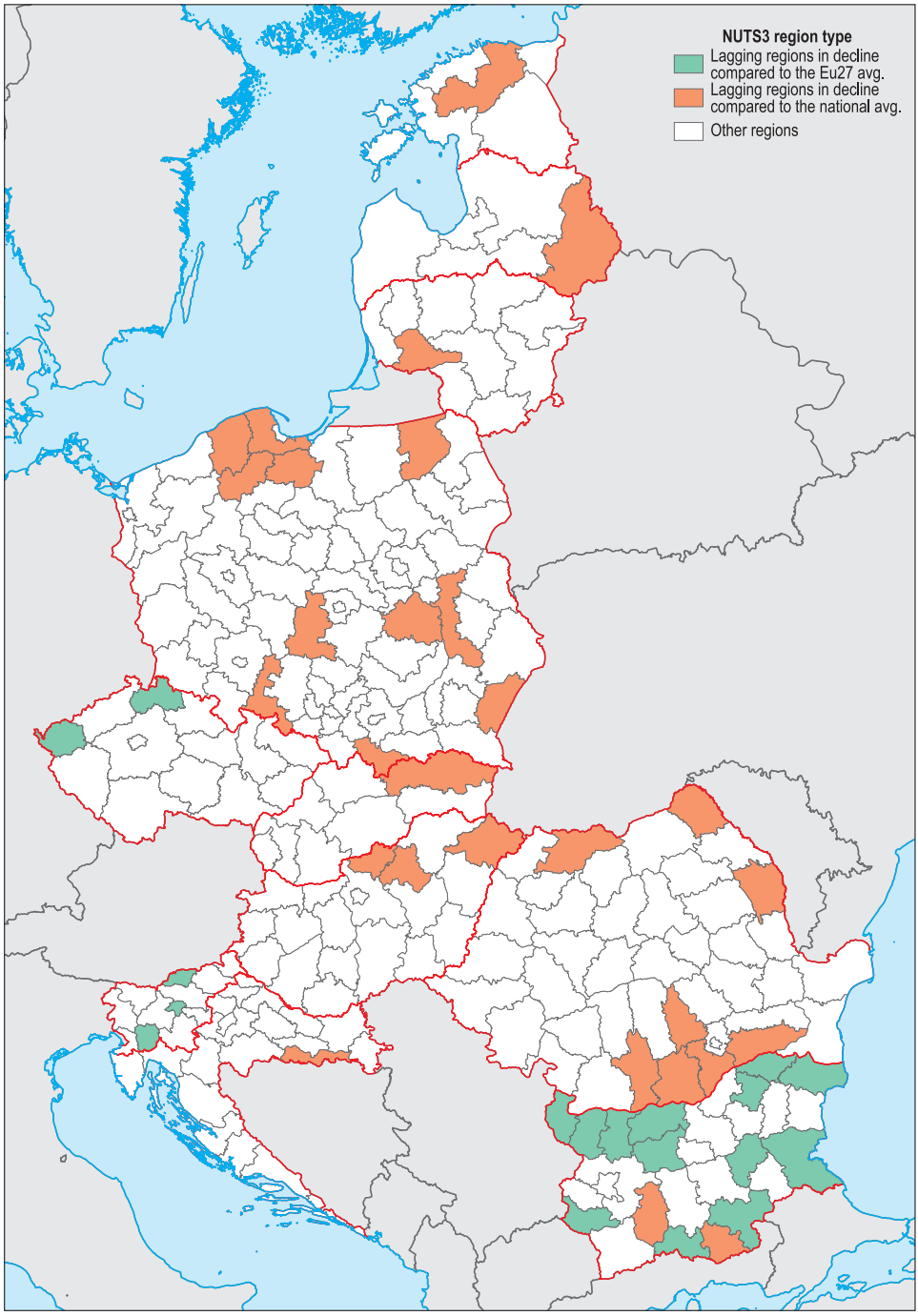

Fig. 5. Spaces of underdevelopment: (Re)production of uneven development. *Source:* Elaborated by the authors using ARDECO Database, SUVGDP, GDP at current prices (PPS).

The transformational recession represented a severe shock, but it was accompanied by a widespread expectation of rapid economic development and a reduction of internal disparities. Three decades later, these expectations have largely proven illusory.

While some countries and regions experienced relatively rapid recovery – most notably Poland, Slovakia and Estonia – many Central and Eastern European regions did not display sustained or generalized economic progress, and in several cases did not even regain their former relative positions in economic production for prolonged periods. Delayed (self)catching-up was particularly evident in Lithuania, in peripheral regions of Hungary, in Transylvanian Romania, and in most Bulgarian NUTS3 units, where the most disadvantaged positions are concentrated. These temporal differences represent the dynamic production of spatial differentiation inherent to capitalist development.

A key contribution of the paper lies in demonstrating how relative equalization on the macro-level can coexist with differentiation on the regional level. Compared to EU-27 GDP per capita averages, most Central and Eastern European regions show some degree of catching up, reflecting the faster overall growth of the macro-region since the mid-1990s. However, this aggregate equalization masks widening inequalities within countries. National-level analyses reveal that many NUTS3 regions diverged from their national averages, regardless of their initial development levels. This finding reinforces the argument that capitalist spatial dynamics generate simultaneous differentiation and equalization rather than leading to uniform convergence claimed by neoclassical theories (Smith, N. 1992, 2010 [1984]).

The identification of places of underdevelopment further reinforces this interpretation. Regions that are falling behind at both the EU and national levels – most prominently in Bulgaria, parts of Czechia, Slovenia and Croatia – occupy structurally disadvantaged positions. These areas are not simply lagging in a temporal sense but appear to be locked into trajectories of underdevelopment, as capital repeatedly bypasses them in favour of more profitable locations. Many peripheral rural regions exhibit persistent move away from national averages, highlighting how uneven development operates not only between countries but also within them, reshaping internal spatial hierarchies.

The analysis of productivity and employment dynamics adds further depth to this interpretation. The most common development pathway in CEE has been increasing productivity accompanied by declining or stagnating employment, particularly in dynamic urban centres and capital regions. This reflects capital-intensive growth driven by foreign direct investment and export-oriented restructuring (see Pavlínek, P. 2004, 2018, 2022; Smith, A. 1994, 2003). In contrast, structurally unfavourable regional economies – especially in Bulgaria and Croatia – experienced declining productivity despite increasing employment. The most disadvantaged regions are those where both productivity and employment declined between the mid-1990s and late 2010s, and these areas largely coincide with regions experiencing differentiation from the EU-27 averages. These patterns reveal how capital selectively mobilizes labour and productive capacities, reinforcing spatial inequalities rather than resolving them (Massey, D. 1995).

Taken together, the findings challenge the neoclassical notion of economic convergence as an inevitable outcome of market integration and EU membership. Instead, they underscore that the rapid integration of CEE into global capitalism primarily served the interests of the broader capitalist system by opening new markets, securing cheap labour and facilitating capital accumulation. As a result, certain regions benefitted disproportionately from integration, while others were relegated to marginalized positions, sometimes falling below their former levels of economic production achieved under state socialism. By identifying persistent places of underdevelopment, the paper shows that these inequalities are not accidental or transitional but constitute an inherent mode of operation of capitalist development in the region.

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Beyond institutions: Functional integration, cross-border flows, and the limits of European border integration

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Abstract

This article examines the functional dimension of cross-border integration in European border regions, focusing on everyday cross-border flows as key mechanisms shaping territorial integration beyond formal institutional arrangements. It addresses the growing mismatch between dense socio-economic interactions across borders and the often-limited capacity of institutionalized cross-border cooperation to stabilize or govern these processes. Drawing on relational and flow-based perspectives in border studies and regional geography, the article conceptualizes functional integration as a practice-based process rooted in regular mobility, service use, and economic exchange. The analysis is based on a critical synthesis of existing theoretical and policy-oriented literature. It introduces cross-border functional areas as an analytical construct capturing the spatial imprint of stabilized cross-border interactions. Rather than treating these areas as formal territorial units or normative policy objectives, the article highlights their dynamic, sectorally differentiated, and politically contingent character. Particular attention is paid to structural asymmetries between national systems, the selective permeability of borders, and the vulnerability of functional integration in highly regulated policy domains. The main contribution of the article lies in clarifying the analytical value of functionality for understanding both the potential and the limits of cross-border integration. By decoupling functional integration from institutional density, the article provides a conceptual framework for interpreting uneven integration patterns and for future empirical research on cross-border governance and resilience in European borderlands.

Keywords: cross-border integration, cross-border cooperation, cross-border functional areas, border permeability, multi-level governance

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Introduction

Cross-border cooperation (CBC) and related cross-border integration (CBI) have long been regarded as among the most visible manifestations of European integration at the sub-national level (Scott, J.W. 1999; Perkmann, M. 2003; Böhm, H. 2023). CBI refers to a broader, processual transformation of border regions, in which socio-economic flows, everyday practices, and relational spatial logics increasingly transcend state borders. CBC represents an institutionalized and intentional response to these processes, seeking to manage, stabilize, or steer integration while often lagging behind their uneven, sectorally differentiated dynamics. CBC can be understood as an institutionalized component or dimension of CBI. CBI can occur even without CBC, but CBC without CBI is often formal and has little actual impact (Perkmann, M. 2003; Durand, F. and Decoville, A. 2019).

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Since the 1990s, CBC has been promoted as a policy instrument to mitigate the fragmenting effects of state borders, foster territorial cohesion, and enable joint solutions to shared challenges in border regions (Medeiros, E. 2011; Jeřábek, M. *et al.* 2018; Fogarasi, J. 2024). Consequently, research on CBI has been strongly shaped by an institution-centered perspective, focusing on the density and formalization of cooperation frameworks such as INTERREG projects, Euroregions, or European Groupings of Territorial Cooperation (EGTCs) (Perkmann, M. 2007; Medeiros, E. 2018; Noferini, A. *et al.* 2020; Ulrich, P. 2021). Within this perspective, integration is often implicitly equated with the presence and territorial coordination mechanisms.

However, the increasing differentiation of European border regions raises fundamental questions about the explanatory power of institution-centered approaches to CBI. Areas such as the Greater Region around Luxembourg or sections of the Upper Rhine are perceived as strongly integrated both functionally and institutionally. However, there are border areas that exhibit dense CBI in daily routines, such as commuting, shopping, service use, tourism, and informal economic exchange, despite weaker or fragmented institutional cooperation (e.g. the Austrian–Slovak borderland in the Vienna–Bratislava metropolitan area). Conversely, other regions display highly developed formal structures of CBC while remaining only marginally integrated functionally (e.g. the Spanish–Portuguese borderland) (Chilla, T. *et al.* 2012; Decoville, A. *et al.* 2013; Kaucic, J. and Sohn, C. 2021; Böhm, H. *et al.* 2023). This divergence suggests that institutional cooperation alone is an insufficient proxy for understanding CBI processes.

In response to these limitations, border studies and regional geography have increasingly focused on the functional dimension of CBI, emphasizing routine interactions and cross-border flows as key mechanisms for integrating border regions (Sohn, C. 2014; Durand, F. and Decoville, A. 2019). From this perspective, borders are not merely administrative lines separating jurisdictions, but differentiated socio-spatial structures that differentially enable or constrain interaction across policy domains and scales (Paasi, A. 1999; Brunet-Jailly, E. 2005; Newman, D. 2006). Functional integration, thus, refers to the degree to which socio-economic processes operate across borders, producing territorially embedded yet institutionally fragmented spaces of interaction.

Despite its growing prominence in academic debates and EU policy discourse, functionality remains conceptually undertheorized within the broader field of CBI. Functional integration is often invoked as a normative objective or technical criterion, while its analytical relationship to institutions, governance capacity, and territorial cohesion remains insufficiently specified (ESPON 2019a, b). In particular, the existence of intense cross-border flows does not automatically lead to institutionalization. Instead, functional integration is shaped by structural asymmetries between national systems, sector-specific regulation, and the enduring authority of the state over key policy domains (Perkmann, M. 2007; Knippschild, R. 2011).

This article suggests that functional integration should be treated not as a supplementary dimension of CBI and a secondary factor in CBC, but as a central analytical entry point for understanding both its possibilities and its limits. It also does not assume a fixed temporal or causal sequence between functional integration and institutionalization. Instead, the two dimensions frequently remain misaligned. By moving beyond institution-centered accounts, the article conceptualizes functional CBI as an outcome of everyday cross-border flows that may condition and at times undermine formal governance frameworks, without necessarily leading to any corresponding institutionalization (Perkmann, M. 2003; Sohn, C. 2014). The article further contends that the spatial expression of these processes can be captured through the concept of cross-border functional areas (CBFAs), understood not as

fixed territorial units but as dynamic configurations of interaction whose boundaries are fuzzy, sectorally differentiated, and politically contingent (Decoville, A. *et al.* 2013; ESPON 2025).

The originality of this article lies in repositioning functionality as a diagnostic perspective. This perspective enables a reinterpretation of existing empirical research by revealing systematic mismatches between institutional form and functional practice. It highlights analytically significant false positives in governance-rich but functionally weak regions, as well as false negatives in functionally integrated areas lacking strong governance arrangements. From a geographical perspective, functional integration unfolds unevenly across spatial scales, linking micro-level recurrent practices with meso-level regional configurations, while remaining constrained by macro-level state territoriality.

The main objective of this paper is to systematize theoretical approaches to the functional dimension of CBI within the EU context. It seeks to:

– Clarify the conceptual foundations of functional CBI by linking border theory, flow-based approaches, and cross-border governance debates (Paasi, A. 2009; Brunet-Jailly, E. 2005; Van Houtum, H. 2000).
– Examine CBFAs as analytical constructs that reveal the uneven and selective nature of integration (Durand, F. and Decoville, A. 2019; Turner, C. *et al.* 2022).
– Identify the institutional and systemic constraints that limit the transformation of functional linkages into stable governance arrangements, with particular attention to cross-border public services (CBPS) (OECD 2013; ESPON 2019a). By synthesizing existing theoretical debates, the article contributes to border studies and regional geography by refining the analytical value of functionality and by providing a conceptual framework for future empirical research on European borderlands.

The article adopts a conceptual, theory-driven approach grounded in a critical synthesis of the existing literature on CBI, border theory, and flow-based spatial perspectives within the European context. The literature review was conducted between October 2025 and December 2025 using Web of Science, Scopus, Google Scholar, and selected policy repositories, including ESPON, OECD, and the Council of Europe. The review focused primarily on publications from 1990 to 2025, reflecting the evolution of European territorial cooperation since the launch of INTERREG. Sources were selected based on their conceptual relevance to CBI/functionality debates, their contribution to border studies and regional governance research, and their empirical relevance to European border regions. Search terms combined keywords related to: CBC, CBI, CBFAs, governance, border permeability, and CBPS. The analytical procedure followed an iterative thematic review and conceptual synthesis, focusing on three recurring dimensions: (1) the relationship between institutional and functional integration, (2) the role of cross-border flows and selective border permeability, and (3) the emergence and limitations of CBFAs. This analytical process informed the development of the conceptual matrices presented in tables 1 and 2 and supported the construction of a theoretically grounded conceptual framework for understanding functional integration in European border regions. Empirical references to European border regions are used illustratively to clarify analytical distinctions rather than to evaluate integration outcomes in specific cases; accordingly, functional integration is treated primarily as an analytical lens while remaining open to operationalization through sector-specific indicators.

From institutions to functionality

This section shifts the analytical focus toward the functional logics through which cross-border space is produced in everyday practice. From a geographical perspective, this production reflects spatially differentiated interaction patterns instead of territorially uniform integration outcomes. The section

clarifies the conceptual distinction between institutional and functional modes of organizing cross-border relations and explains why this distinction is analytically consequential. From a functional perspective, institutions rarely create integration *ex nihilo* but tend to emerge reactively in response to pressures generated by daily cross-border interactions. Where such pressures are weak or sectorally limited, institutional cooperation often remains symbolic and project-based (Chilla, T. *et al.* 2012; Kurowska-Pysz, J. *et al.* 2018; Kaucic, J. and Sohn, C. 2021). This project-oriented logic is strongly reinforced by EU funding frameworks such as Interreg, where cooperation frequently depends on temporary project cycles and administrative innovation rather than on durable institutional consolidation (Novotný, L. 2026). This functional–institutional asymmetry can be interpreted through Brenner's concept of state spatial selectivity, which highlights the uneven and sector-specific nature of state intervention across policy domains (e.g. prioritizing labour mobility over health-care integration) (Brenner, N. 2004).

Cross-border flows are sectorally differentiated and structurally asymmetric, reflecting differences in regulatory regimes and institutional competencies between neighbouring states (Sohn, C. 2014; Böhm, H. 2019). As Martinez, O.J. (1994) observed, strong functional interdependence does not necessarily translate into corresponding levels of institutional integration. A functional lens, thus, brings into view forms of integration that remain largely invisible in institution-centered analyses, capturing the routinized character of cross-border relations while highlighting their fragility and political contingency. Functional linkages may stabilize over time, but they remain vulnerable to regulatory change, institutional asymmetries, and crisis-driven re-bordering, as demonstrated by recent disruptions of cross-border mobility in Europe (Opioła, W. and Böhm, H. 2022; Böhm, H. 2023).

Adopting a functional perspective does not imply abandoning institutions as objects of analysis. Instead, institutions are repositioned within a broader relational configuration. This configuration consists of dynamic cross-border socio-economic interdependencies shaped by flows, everyday practices, and uneven border openness. They are conceptualized not as primary drivers of integration, but as selective and often delayed responses to uneven functional dynamics. When integration is assessed solely through institutional density, this asymmetry between functional interdependence and governance capacity tends to be obscured. As a result, institutionally dense but weakly integrated spaces may be overestimated, while functionally integrated areas lacking strong governance structures remain underestimated (Decoville, A. *et al.* 2013; Turner, C. *et al.* 2022).

Given the interconnectedness of the functional and institutional dimensions of CBI, it is impossible to identify entirely pure examples. However, for example, the Austrian–Slovak borderland in the Vienna–Bratislava metropolitan area *(Figure 1)* has experienced intensive cross-border commuting, cross-border living, and suburbanization, as well as labour-market integration since the 1990s, despite comparatively fragmented cross-border governance and limited territorial coordination in spatial planning and transport policy. Many institutions exist (e.g. the CENTROPE Initiative, Euroregion Pomoraví/Weinviertel/Záhorie). Still, they have limited institutional capacity and constrained territorial coordination relative to the intensity of functional integration (Sohn, C. and Giffinger, R. 2015). Despite ambitious narratives of metropolitan integration, CENTROPE has often been characterized by comparatively weak institutional consolidation, fragmented multi-level governance, and limited implementation capacity. The Euroregion Pomoraví/Weinviertel/Záhorie experienced prolonged organizational stagnation, the effective collapse of its trilateral structure, particularly due to the problems in its Slovak part, and only recent institutional reanimation.

Conversely, several sections of the Spanish–Portuguese borderland exhibit relatively dense institutionalized CBC despite comparatively limited functional integration in every-

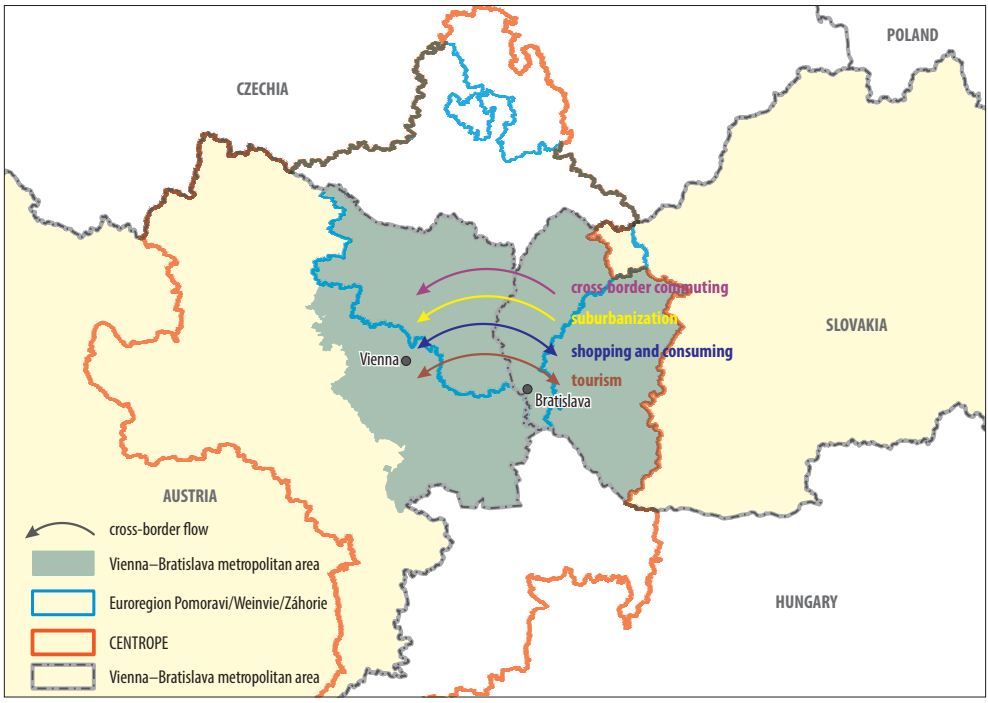

Fig. 1. CBI in the Vienna–Bratislava metropolitan area. *Source:* Authors' own elaboration.

day socio-economic terms. Since the 1990s, the border has been characterized by extensive institutional frameworks, including multiple Euroregions (e.g. Galicia–Norte de Portugal, EuroACE), EGTCs (e.g. Duero-Douro, Rio Minho), and other CBC structures, which have contributed to a comparatively high degree of formalized cross-border governance and project-based cooperation. In particular, the density of EGTCs is substantially higher than in Central Europe. However, despite this comparatively strong institutional dimension and related capacity, many border sections continue to display relatively weak functional integration characterized by low population density, demographic decline, limited cross-border commuting, weak labour-market integration, and relatively low intensities of ordinary cross-border mobility outside a few metropolitan or coastal areas (Podadera Rivera, P. and Calderón Vázquez, F.J. 2018). These contrasting configurations illustrate that cross-border interdependence and institutional density may develop unevenly and should therefore be treated as analytically distinct dimensions of CBI.

Understanding CBI in functional terms requires moving beyond a static territorial ontology toward a relational conception of borders and borderlands. This analytical shift is summarized in *Table 1*.

Borders as selectively permeable and relational spaces

From a functional perspective, borders cannot be understood merely as residual administrative lines or static geopolitical divisions (Paasi, A. 1999; Newman, D. 2006). Instead, they operate as relational structures that selectively enable, channel, or constrain cross-border interaction. Borders remain analytically relevant not because they separate territories,

Table 1. Institution-centered vs. functional perspectives on CBI

Dimension	Institution-centered view	Functional view
Core focus	Formal cooperation structures	Everyday practices and flows
Indicator of integration	Institutional density	Regularity and intensity of flows
Spatial logic	Bounded territories	Relational, fuzzy configurations
Temporality	Project-based	Practice-based, continuous
Sensitivity to asymmetries	Limited	Central
Vulnerability to crisis	Often implicit	Explicit and structural

Source: Authors' own elaboration.

but because they differentially condition the emergence and stability of cross-border practices. Despite formal openness within the EU, borders continue to produce persistent effects, shaping economic behaviour and recurrent mobility in border regions (Capello, R. *et al.* 2018). These effects are uneven across policy domains and governance levels. Borders therefore condition cross-border interaction unevenly across sectors and scales. From a functional viewpoint, the key analytical question is not whether borders are open or closed, but how, for whom, and in which sectors they are permeable. As a result, borderlands emerge as internally differentiated spaces in which integration intensities vary spatially and sectorally.

Relational approaches further highlight that borders act simultaneously as constraints and resources. Actors in specific sectors may strategically mobilize regulatory differences and institutional asymmetries, enabling certain forms of cross-border interaction while constraining others (Van Houtum, H. 2000; Sohn, C. 2014; Wassenberg, B. and Reitel, B. 2020). However, for the analysis of functional integration, relationality becomes analytically meaningful only when linked to functional differentiation. Without this link, relational conceptions risk obscuring the material and regulatory asymmetries that structure routine cross-border practices.

The concept of selective border permeability provides a crucial explanatory bridge between daily routines and the uneven geography of functional integration. Certain functions, such as commuting, consumption, or tourism, may transcend borders, while authority, regulation, and key public services remain nationally anchored (Sassen, S. 2006). Functional integration does not dissolve territorial sovereignty but modifies how it operates spatially. Understanding borders as differentiated relational structures reframes CBI as an uneven and adaptive configuration. Borders actively structure which flows stabilize, which remain fragile, and which are blocked altogether. This perspective provides the conceptual groundwork for analyzing cross-border flows as mechanisms of functional integration and for interpreting CBFAs as spatial expressions of selective and uneven permeability.

Cross-border flows as mechanisms of functional integration

Flow-based perspectives conceptualize CBI as emerging from recurrent interaction rather than from territorial design or institutional intent (Castells, M. 1996; Blatter, J. 2004). From this viewpoint, integration is produced through recurrent interaction that routinely traverse state borders and generate patterned interdependencies without necessarily crystallizing into formal institutional configurations. Cross-border flows, thus, function as constitutive mechanisms of functional integration, actively producing the conditions in which integration takes place (e.g. through daily cross-border commuting that gradually creates shared labour-markets and service linkages even in the absence of formal institutions). These flows typically precede and condition institutional responses.

Empirical research shows that routine mobility practices, such as commuting, shopping, service use, or informal social interaction, often anchor functional integration in borderland lifeworlds while remaining weakly institutionalized. Studies along the Bavarian–Czech border reveal dense socio-spatial interdependencies that are poorly captured by policy instruments (Blossfeldt, S. 2025), while analyses of cross-border central places demonstrate how localized practices may stabilize functional linkages without leading to institutional consolidation (Blossfeldt, S. 2023). Similar dynamics can also be observed in cross-border rural tourism, where recurring tourist mobility and shared destination practices contribute to functional integration despite relatively limited institutional consolidation (Novotný, L. 2025). Functional integration, thus, emerges from below as an everyday process embedded in strategies of individuals and households (Van Houtum, H. and Van der Velde, M. 2004; Rumford, C. 2006). Divided and twin towns in Central Europe provide particularly illustrative cases. Settlements such as Komárno/Komárom, Český Těšín/Cieszyn, or Görlitz/Zgorzelec combine intense interaction with persistent institutional fragmentation, making them not only emblematic laboratories of European integration but also functional CBI (Dołzbłasz, S. 2015; Jańczak, J. 2024). Here, cross-border interdependence is sustained primarily through proximity and routine mobility instead of through comprehensive governance alignment.

Theoretically, these dynamics resonate with M. Castells's (1996) notion of the space of flows, which emphasizes mobility, circulation, and networks as key structuring forces of contemporary spatial organization. Applied to border regions, this perspective foregrounds the tension between territorially bounded governance and functionally organized socio-economic practices. As Blatter, J. (2004) shows, functional integration unfolds through relational proximities generated by recurrent interaction, often cutting across administrative borders without corresponding institutional consolidation. Within this article, the space-of-flows perspective serves as a metatheoretical backdrop, situating recurrent cross-border flows as analytically central mechanisms of integration.

Economic and mobility-related flows represent the most visible manifestations of functional integration. In cross-border metropolitan regions such as Øresund or the Upper Rhine, intensive commuting has generated pressures for selective coordination in transport, taxation, and social security, illustrating how functional integration may trigger institutional responses (OECD 2013). Yet such trajectories remain contingent and uneven. Even where flows are dense, institutional alignment often lags behind functional realities. Crucially, functional linkages generated through cross-border flows are selective, sector-specific, and structurally asymmetric. They reflect uneven border permeability across policy domains, with high mobility in areas such as consumption or labour-markets coexisting with persistent barriers in health care, education, or professional accreditation (OECD 2013; Sohn, C. 2014; Böhm, H. 2019). As Martinez, O.J. (1994) already observed, intense interaction can coexist with limited institutional integration, producing patterned interdependence without systemic convergence. The governance sensitivity of different flow types is summarized in *Table 2*.

Table 2. Types of cross-border flows and their governance sensitivity

Type of flow	Governance sensitivity	Typical outcome
Consumption/shopping	Low	Informal, stable
Labour commuting	Medium/high	Partial coordination
Public transport/mobility systems	High	Project-based
Education	Very high	Strong constraints
Health care/emergency services	Very high	Fragile, exceptional

Source: Authors' own elaboration.

This framing allows cross-border flows to be interpreted not as indicators of generalized border erosion, but as diagnostic signals revealing where and how borders continue to matter. The intensity, direction, and stability of flows expose mismatches between everyday functional practices and institutional frameworks, highlighting domains in which integration is driven by practical necessity rather than political intent (Decoville, A. *et al.* 2013; Kaucic, J. and Sohn, C. 2021). The spatial significance of flows becomes evident in the concept of CBFAs, which represent the territorial imprint of stabilized cross-border interactions defined by the density and regularity of functional linkages (Jakubowski, A. *et al.* 2022). They capture relational and sector-specific configurations whose contours remain fuzzy and contingent.

At the same time, reliance on flows renders functional integration structurally vulnerable. Because it depends on the continuity of routine interactions under conditions of relative border openness, it remains susceptible to regulatory change and crisis-driven re-bordering. The COVID-19 pandemic demonstrated how quickly established cross-border flows can be disrupted through unilateral state action, revealing the political contingency and limited institutional protection of functional integration (Opioła, W. and Böhm, H. 2022; Böhm, H. 2023).

Cross-border functional areas as the spatial expression of functionality

CBFAs represent the most explicit spatial expression of functional integration in border regions. Instead of denoting formally constituted territories or stable governance units, CBFAs capture the territorial imprint of recurrent cross-border interactions emerging from daily socio-economic practices (Jakubowski, A. *et al.* 2022). Their analytical value lies precisely in their non-territorial character. They translate stabilized functional linkages into observable spatial configurations without presuming fixed boundaries, institutional completeness, or territorial closure *(Figure 2).*

This conceptual openness is not merely a consequence of data limitations or methodological ambiguity (ESPON 2025) but reflects a structural mismatch between functionally organized interaction patterns and territorially bounded governance systems. CBFAs are therefore best understood as relational configurations, rather than as entities defined by administrative borders or sovereign competences. These non-territorial networks express themselves through concrete routinized interdependencies, such as cross-border labour commuting, service use, or shared infrastructures (as illustrated by the twin towns or the Vienna–Bratislava metropolitan area) (CEMAT 2017; Studzieniecki, T. *et al.* 2024). Their fluid boundaries and sectoral differentiation are not analytical deficiencies, but constitutive features of functional integration under conditions of state sovereignty. CBFAs should not primarily be understood as new territorial levels or embryonic governance units. Where coordination exists, it typically takes the form of loosely coupled arrangements among subnational actors, without the creation of binding cross-border authorities or the transfer of sovereign competences (Studzieniecki, T. *et al.* 2024). This institutional lightness is often structural rather than merely transitional. Functional integration unfolds within nationally bounded political systems that limit the scope for durable territorial consolidation.

Interpreting CBFAs as incomplete territories awaiting institutional completion reflects what Faludi, A. (2018) conceptualizes as a territorialist bias, the tendency to equate governance capacity with bounded, institutionalized territory. A functional perspective challenges this assumption by treating CBFAs as analytical representations of functional interaction rather than normative policy objectives. They make visible where functional integration materializes spatially, while simultaneously exposing its unevenness, fragility, and limited governability (ESPON 2019b).

Analytically, the identification of CBFAs rests on the intersection of two dimensions. The first concerns the existence, intensity, and

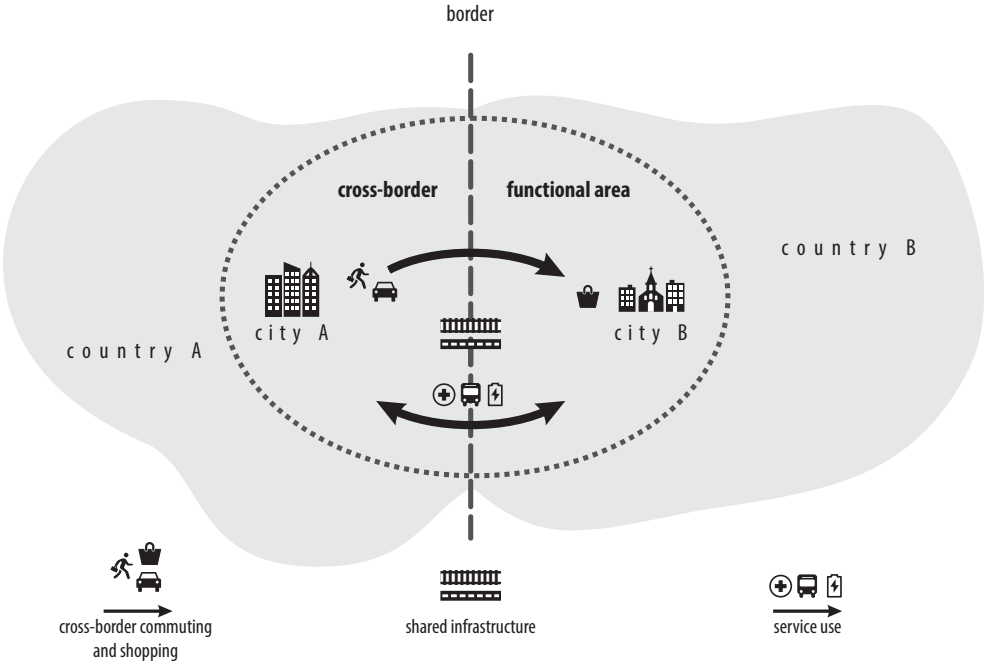

Fig. 2. Conceptual representation of a CBFA. *Source:* Authors' own elaboration.

regularity of cross-border interactions shaped by flows and selective border permeability. The second relates to spatial characteristics across the border, including functional complementarities and structural discontinuities between national systems (ESPON 2019b; Noferini, A. *et al.* 2020). Together, these dimensions reinforce the understanding of CBFAs as relational spaces whose coherence is produced through recurrent interaction.

From an empirical perspective, functional integration can be identified through the intensity, regularity, and spatial concentration of cross-border flows and everyday practices. It requires a multidimensional assessment. Relevant indicators may include cross-border commuting, shopping mobility, public transport connectivity, service use, tourism flows, or cross-border school attendance (OECD 2013; ESPON 2019b). Importantly, border regions may exhibit strong integration in certain sectors while remaining weakly integrated in others. No single indicator can capture functional integration comprehensively because integration intensities vary across sectors, scales, and types of cross-border interaction. CBFAs should therefore be understood not as territorially uniform entities, but as relational and function-specific configurations whose spatial extent varies according to the type of interaction analyzed.

To avoid normative overextension, Jakubowski, A. *et al.* (2022) distinguish between potential and actually existing CBFAs. While potential CBFAs are characterized by proximity and latent complementarities, existing CBFAs exhibit demonstrable and stabilized cross-border interactions and, in some cases, limited governance arrangements. Crucially, only the highest level of this mod-

el corresponds to strong institutionalization. Many CBFAs remain functionally integrated while governance-light.

Empirical illustrations from cross-border metropolitan regions such as Øresund or the Upper Rhine, and from emerging industrial linkages in the Polish–Czech–Slovak border zone between Katowice, Ostrava, and Žilina, demonstrate that spatial coherence may emerge through flows and networks without formal territorial recognition (ESPON 2024). In such cases, functional integration precedes, bypasses, or only partially translates into institutional design.

Because functional integration frequently exceeds the capacity of existing administrative frameworks, CBFAs often rely on flexible and informal coordination mechanisms. Soft spaces, understood as weakly institutionalized, overlapping arenas of cooperation, may temporarily compensate for governance gaps when formal instruments are constrained (Allmendinger, P. and Haughton, G. 2009; Faludi, A. 2010; Nienaber, B. and Wille, C. 2020). However, their reliance on informality reinforces the contingent and fragile character of CBFA functionality, particularly in strongly regulated policy domains.

CBFAs should therefore be understood as relational configurations through which functional integration becomes spatially visible under conditions of territorially bounded governance.

Limits of functional integration: asymmetries, governance, and resilience

Functional integration in border regions unfolds within nationally bounded political and regulatory systems and is therefore inherently constrained. These limits are not temporary deficiencies or incomplete stages of integration, but constitutive features of CBI under conditions of state sovereignty. Functional interdependence may intensify cross-border interaction, yet it remains dependent on regulatory tolerance, political stability, and the conditional openness of borders, producing uneven and reversible integration outcomes.

A primary source of these limits lies in structural asymmetries between neighbouring states. Differences in economic development, wage levels, regulatory frameworks, welfare systems, administrative cultures, and the distribution of competences actively shape both the emergence and the constraints on functional integration (Perkmann, M. 2007; Knippschild, R. 2011; ESPON 2019b). While such asymmetries often generate cross-border mobility, particularly in labour and consumption, they simultaneously impede territorial coordination, harmonization, and shared service provision, limiting the depth and durability of integration (Sohn, C. 2014; Böhm, H. 2019). Kurowska-Pysz, J. *et al.* (2018) further demonstrate that cross-border interaction in Euroregions is frequently constrained by administrative asymmetries, fragmented competences, weak political commitment, and uneven stakeholder capacities, particularly in peripheral border regions. This produces a structural misalignment between the functional logic of cross-border space and the territorially bounded organization of governance. Daily practices and flows routinely transcend borders, while decision-making authority remains embedded in national legal and administrative systems. As a result, functional integration advances primarily in weakly regulated or politically less sensitive domains, such as consumption, tourism, or specific segments of labour mobility, while remaining constrained in sovereignty-sensitive sectors, including health care, education, labour law, or social security (OECD 2013; Durand, F. and Decoville, A. 2019). Functional integration, thus, takes the form of uneven and sector-specific interdependence.

From a governance perspective, these limits become particularly visible in attempts to institutionalize functional linkages. CBC frameworks, including Euroregions and EGTCs, operate within multi-level governance systems that severely restrict their capacity to address asymmetries rooted

in national legislation and state competences (Hooghe, L. and Marks, G. 2001; Perkmann, M. 2007; Noferini, A. *et al.* 2020). Institutionalization, therefore, does not automatically follow from functional interdependence. It remains selective, sectorally confined, and politically contingent.

CBPS illustrate these constraints particularly clearly. As the most advanced expression of functional integration, they directly respond to daily needs in border regions, yet continue to be highly fragile. Their functioning depends on complex coordination across governance levels and legal systems, where even minor national-level inflexibilities can suspend service provision (OECD 2013; Böhm, H. 2019; ESPON 2019a).

Crises render these structural limits visible. Episodes such as the COVID-19 pandemic and the migration crisis demonstrate how quickly states can reassert border control, unilaterally disrupting established cross-border flows and exposing the political contingency of functional integration (Klatt, M. 2020; Opiłowska, E. 2021; Opioła, W. and Böhm, H. 2022; Weber, F. 2022; Böhm, H. 2023). Even in regions characterized by dense everyday interaction, such as Těšín/Cieszyn Silesia on the Czech–Polish border, where an autochthonous Polish minority is present on Czech territory, cross-border interdependence remains poorly protected by institutions.

From an actor-centered perspective, the resilience of functional integration depends less on formal institutional design than on the strategic agency of actors operating across governance gaps (Sotarauta, M. 2016). Adaptive capacity emerges through brokerage, coordination, and improvisation by individuals and organizations positioned at the interface of multiple governance systems. Informal networks and soft governance spaces may temporarily sustain coordination under crisis conditions (Allmendinger, P. and Haughton, G. 2009; Faludi, A. 2010), but their stabilizing capacity remains highly selective and insufficient in strongly regulated sectors. Resilience, thus, functions as an analytical concept rather than a normative objective. It refers to the capacity of cross-border systems to absorb shocks and maintain minimal functional linkages under conditions of institutional uncertainty (Pascariu, G.C. *et al.* 2020; Andersen, D.J. and Prokkola, E.-K. 2021). However, this capacity is uneven and sectorally differentiated. Sectors such as health care, labour-markets, or professional accreditation remain particularly vulnerable to disruption, with even short-term border closures producing disproportionate effects on borderland populations (OECD 2013; Böhm, H. 2019; Opioła, W. and Böhm, H. 2022).

Taken together, the limits of functional integration are not failures of CBC, but structural features of integration within multi-level, state-centered governance systems. Functional interdependence may generate pressures for coordination, yet it cannot secure stable governance outcomes. Cross-border regions, thus, emerge as configurations of negotiated and reversible interdependence.

Discussion

This article has challenged the widespread assumption that the density of institutionalized CBC can be treated as a reliable proxy for the depth of CBI. By repositioning functionality as an analytical entry point, the discussion reframes integration as a practice-based, sectorally differentiated, and politically contingent process whose dynamics are only partially captured by formal governance frameworks.

A first key insight concerns the persistent misalignment between institutional density and functional integration. Institution-centered approaches implicitly equate the presence of cooperation frameworks with integration outcomes. Yet, a functional perspective demonstrates that stabilized socio-economic interactions frequently emerge before or after institutional consolidation. This confirms earlier critiques of governance-centered readings of CBI (Perkmann, M. 2003; Chilla, T. *et al.* 2012), but advances them by showing that institutional density does not merely underestimate functional integra-

tion. It may actively distort it. Governance-rich regions can appear highly integrated despite limited everyday interaction, while functionally dense but institutionally light configurations remain analytically underestimated. Treating institutional presence as an indicator of integration, therefore, generates systematic false positives and false negatives, obscuring the geography of integration as lived practice. Research on Euroregional cooperation has repeatedly shown that the existence of formal CBC structures does not necessarily translate into intensive socio-economic integration or durable cross-border interaction (Kurowska-Pysz, J. *et al.* 2018).

Second, positioning functionality analytically before institutions reframes the role of CBC within multi-level governance systems. This does not suggest a universal sequence in which functional integration always precedes institutionalization, but rather highlights that the two dimensions may evolve unevenly, independently, or only partially reinforce one another. Instead of acting as a primary driver of integration, CBC appears as a selective and reactive response to integration pressures generated by everyday practices and cross-border flows. This interpretation also resonates with participatory governance perspectives, which emphasize that institutionalized CBC often operates through selective, project-based, and weakly embedded forms of coordination that involve unevenly empowered civil society actors (Ulrich, P. 2021). It further aligns with relational and flow-oriented accounts that conceptualize integration as emerging from recurrent interaction rather than institutional design (Blatter, J. 2004; Sohn, C. 2014), while clarifying why institutionalization remains partial, delayed, or sectorally confined. Cooperative arrangements typically address specific functional demands while staying constrained by nationally bounded legal competencies and regulatory asymmetries. Such interdependence therefore does not constitute a linear pathway toward institutional consolidation, but unfolds alongside, and sometimes independently of, formal governance arrangements. Similar mismatches between institutional form and functional practice have also been identified in comparative studies of European border regions (Decoville, A. *et al*. 2013; Turner, C. *et al.* 2022).

Third, the functional perspective repositions CBFAs not as embryonic governance units awaiting institutional completion, but as interaction-based configurations capturing the spatial imprint of stabilized cross-border interaction under conditions of state sovereignty. Rather than extending the primarily delimitation-oriented approach proposed by Jakubowski, A. *et al.* (2022), this perspective emphasizes the uneven, contingent, and only partially governable character of functional integration. This challenges what Faludi, A. (2018) describes as a territorialist bias, the tendency to equate governance capacity with bounded, institutionalized territory.

Empirical illustrations ranging from cross-border metropolitan regions (Øresund, Upper Rhine) to divided towns in Central Europe and emerging industrial corridors in post-socialist borderlands suggest that functional integration follows no single spatial logic. Instead, it appears wherever habitual cross-border behaviour aligns with selective regulatory tolerance. Spatial coherence is generated not through administrative design, but through recurrent interaction, producing interaction-based configurations whose contours remain adaptive and sectorally differentiated.

The role of crisis further sharpens these insights. From the perspective of critical border studies, crises should not be treated as external disruptions of otherwise stable integration trajectories, but as stress tests that reveal the latent hierarchy between daily cross-border practices and state-centered authority structures (Parker, N. and Vaughan-Williams, N. 2012; Opiłowska, E. 2021). Episodes such as the COVID-19 pandemic demonstrated how quickly established cross-border flows can be interrupted through unilateral state action, even in regions characterized by dense daily interaction (Opioła, W. and Böhm, H. 2022; Böhm, H. 2023). Instead of interrupting integration from the outside, crises expose the

political contingency and limited institutional protection of functional integration. Research from the German–French–Luxembourg border region during the COVID-19 pandemic further demonstrated that, even in highly institutionalized and functionally interconnected border regions, border practices, coordination failures, and tensions between national crisis-management regimes could emerge rapidly (Weber, F. 2022).

The capacity to sustain minimal cross-border linkages under such conditions depends less on formal arrangements than on informal networks, trust-based coordination, and soft governance spaces, and the involvement of civil society actors operating across institutional boundaries (Allmendinger, P. and Haughton, G. 2009; Faludi, A. 2010; Kurowska-Pysz, J. *et al.* 2018; Ulrich, P. 2021). While these mechanisms may temporarily compensate for governance gaps, they remain insufficient in strongly regulated sectors such as health care, labour law, or social security. Functional integration, thus, does not erode state authority, but operates conditionally within it, shaped by conditional border openness and enduring national competences.

Overall, the discussion positions functionality as a perspective for interpreting tensions between routine socio-spatial interaction, governance capacity, and state authority. By linking flow-based perspectives with relational border theory, the article moves beyond binary readings of integration versus fragmentation. CBI instead emerges as an uneven process shaped by selective permeability, structural asymmetries, and periodic re-bordering (Paasi, A. 1999; Blatter, J. 2004; Rumford, C. 2006).

While conceptual, the framework developed here has clear implications for empirical research. It suggests that comparative designs should move beyond institutional density as a primary indicator and instead operationalize integration through sector-specific flows, everyday mobility practices, and patterns of selective border permeability. This allows comparisons between institutionally similar border regions with markedly different levels of functional interdependence, helping to identify mismatches between institutional density and functional interdependence. The concept of CBFAs can, thus, be operationalized as relational and sectorally differentiated configurations rather than fixed territorial units, supporting mixed-method approaches that combine mobility and service-use data with qualitative insights into everyday practices and institutional mapping. Finally, the framework invites longitudinal and crisis-sensitive analyses examining how functional linkages persist, adapt, or unravel under conditions of re-bordering, clarifying the resilience and vulnerability of functional integration without presuming linear progress toward institutional consolidation.

Conclusions

This article has argued that integration in European border regions is often shaped more strongly by everyday cross-border practices than by formal governance arrangements. By shifting the analytical focus from institutions to functionality, it has been shown that integration in European border regions is primarily produced through routine cross-border flows and practices that often precede, bypass, or only partially translate into formal institutional configurations. This claim does not imply causal primacy or universal applicability beyond the European governance context.

By reconnecting the distinction between CBI and CBC, the analysis indicates that CBC operates not as the primary driver of integration, but as a selective and reactive response to functional pressures. Cross-border interdependence unfolds unevenly across sectors and scales. Consequently, the presence of formal cooperation structures does not necessarily correspond to the intensity or stability of cross-border interaction. At the same time, dense functional linkages may persist in the absence of strong institutionalization. Institution-centered approaches risk systematically misreading the geography of integration by conflating governance density with func-

tional interdependence. The concept of CBFAs captures the spatial imprint of functional integration by revealing where stabilized cross-border interaction becomes territorially visible despite fragmented governance structures.

The article further emphasizes that functional integration is neither linear nor cumulative. Instead, it oscillates between de-bordering and re-bordering, as daily mobility and interaction coexist with nation-states' enduring capacity to reassert territorial control. Crises such as the COVID-19 pandemic act as stress tests that expose the political contingency and reversibility of functional integration, even in regions characterized by dense everyday cross-border flows. While informal networks and soft governance spaces may temporarily sustain cross-border linkages, their stabilizing capacity remains highly selective and insufficient in strongly regulated domains.

Finally, this article is conceptual and literature-driven rather than empirical. The analytical perspective developed here is explicitly situated within a European governance context shaped by EU-specific institutional conditions. While this clarifies the scope of the framework, it also points to the need for comparative and longitudinal research examining how functional integration interacts with governance structures across sectors and during periods of crisis. In this sense, the functional perspective is not proposed as a substitute for institutional analysis, but as a necessary complement that clarifies both the possibilities and the structural limits of CBI in contemporary Europe.

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From community space to no man's land? – The use of public space by vulnerable social groups in post-socialist housing estates. A case from Budapest, Hungary

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Abstract

Under state socialist planning, large housing estates were built as inclusive, community-centred environments. These spaces were particularly safe for women and children, reinforced by intense social control and close neighbourhood ties. Our study examines the transformation and use of public spaces in post-socialist housing estates, with a particular focus on vulnerable social groups. The research sample area was the Central Housing Estate of Budapest-Pesterzsébet (20th district). The research is based on a complex methodology; in addition to secondary methods, we conducted quantitative and qualitative primary research (resident questionnaire survey, walking interviews/in-depth field interviews, mental map studies, and mapping of pedestrian movement patterns). According to our findings, community areas that were previously actively used have now mostly become underused, neglected spaces that pose a risk to safety. These changes particularly affect young and middle-aged women and young people, limiting their movement and participation in urban life. Research on pedestrian space utilisation has shown that residents' spatial movement basically follows traditional routes, avoiding originally protected and traffic-free routes. This proves that socially oriented planning and the physical infrastructure created as a result do not, in themselves, guarantee the creation of inclusive, safe spaces that can be occupied by communities. A static public space that maintains its former characteristics can lose its social base. For the population to return to community areas, it is necessary to conduct a detailed assessment of the needs of different age groups and genders, and to take them into account in urban planning and development.

Keywords: state socialist urban planning principles, post-socialist large housing estates, pedestrian use of public spaces, spatial inclusion, safety

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Introduction

A key issue in the design and development of cities, neighbourhoods and residential areas is what kind of living conditions and quality of life they provide for the local community. It is no coincidence that a major area of research in urban studies is the development of space utilisation (Jacobs, J. 1961; Lefebvre, H. 1991 [1974]; Montgomery, J. 2007; Gehl, J. 2010; Sepe, M. 2025). Ideally, urban space should be a socially inclusive territorial unit. Spatial inclusion in the urban environment refers to the process and state in which all social groups are guaranteed equal access to urban spaces, services and opportunities, as well as the opportunity to participate in their design and use (Patrick, M. and Mckinnon, I. 2022).

Large housing estates are obvious areas of research regarding of community space, space utilisation, spatial inclusion, and mobility.

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Given that, in post-socialist cities of Central and Eastern Europe, large housing estates became dominant features of post-war housing development and housing estates represent a significant part of the local housing stock, a more thorough examination of space utilisation in housing estates is certainly warranted. Especially because these housing estates satisfy the needs of a great variety of socio-economic groups, mainly the less affluent segments of society (Kovács, Z. *et al*. 2018).

The construction of large housing estates in the state-socialist bloc of Central and Eastern Europe, dominated by the former Soviet Union, was influenced not only by the housing shortage but also by political ideology. One of the main promises of the communist system was the right to affordable housing and access to free community services for all. Although the rejection of any architectural/urban planning ideas originating from beyond the Iron Curtain was a matter of principle, the Soviet Union adapted Clarence Perry's concept of neighbourhood units under the name „rayon theory" (Perry, C. 1998 [1929]; Gogishvili, D. *et al.* 2017), and its guidelines lived on as major organisational principles in post-World War II housing estates constructed as part of housing development programmes in state-socialist countries (Hirt, S.A. 2012). The importance of community life was a key message of the political system, and the specific function, size, and design of public spaces were also the focus of attention for designers (Kalm, K. *et al*. 2023). As the importance of community life was an important message of the political system, open spaces were also well designed and intensively used. Thanks to all this, the public spaces of large housing estates in former socialist countries were particularly inclusive and not exclusionary.

The change of regime brought significant changes in ownership and the composition of housing estate communities, which also affected patterns of space use. Due to trends in the housing market, large housing estates in Hungary and Budapest have become gathering places for the lower middle class over the past three decades (Kovács, Z. *et al.* 2018). Nevertheless, the inherited built environment and the physical characteristics of the spaces between buildings have not fundamentally changed.

Our study focuses on exploring and presenting the space utilisation by vulnerable social groups (women and young people) living in a housing estate environment.

Our research questions are as follows:

1. What processes characterise the space utilisation preferences and actual space utilisation of vulnerable groups (women and young people) in housing estates?
2. How has the formerly welcoming and safe character of housing estate's public spaces changed?
3. Where and in what ways do the space utilisation characteristics of women and young people contradict the original design guidelines and urban planning intentions?

We seek answers to the above questions based on the results of an international research project that has been ongoing since 2024. The DUT 15minESTATES project (https://15minestates.eu/), focusing on sustainable mobility in large housing estates (LHEs), investigates the correlation between urban space, mobility options, and users' needs and opportunities. The main aim of the project is to investigate the adaptability of Carlos Moreno's 15-minute city principles (Moreno, C. 2024) in the partner countries (Bulgaria, Germany, Hungary, Latvia, Switzerland and The Netherlands). Results presented in the paper are based on the research carried out in the Hungarian case study area, in the Central Housing Estate of Pesterzsébet (20th district).

Theoretical framework and literature review

Spatial and demographic characteristics of space usage in large housing estates

In the large-scale housing estate construction projects that followed World War II, urban planning principles, building density, and

spatial characteristics show many similarities between the Western and Eastern European countries. The findings of the research overlap in many respects, as identical spatial characteristics generate similar or repetitive behaviour patterns. The use of space in housing estates has also been the subject of extensive comparative research (Sendi, R. *et al*. 2009, 2023; Dekker, K. *et al*. 2011; Benkő, M. *et al*. 2018; Kovács, Z. *et al*. 2018).

Central and Eastern European countries face greater problems in terms of the management, maintenance, and use of public spaces than in other parts of Europe. The deterioration of the condition and quality of public spaces in housing estates essentially began with the construction of the estates themselves. The planned infrastructure, and community spaces were rarely properly completed to the standard specified in the original plans (Leetmaa, K. and Hess, D.B. 2019). Furthermore, in Central and Eastern European countries, years of underfunding during the socialist period were followed by a complete funding shortfall in the transitional years after the change of regime. This process continues to this day, with minor changes, and international literature has already drawn attention to the deteriorating condition and quality of public space and its role in the deterioration of living conditions (Petsimeris, P. 2018).

The study of the social and economic impacts of urban public spaces gained significant momentum in the 2010s. Such research has also taken off in Central and Eastern European countries, strengthening local social movements for the improvement of public spaces (Letmaa, K. and Hess, D.B. 2019). The results of spatial and social analyses confirmed the contradictions between the needs of the population and the mono-functional design of housing estates. From the outset, large, monotonous housing estates with separate pedestrian lanes have been associated with urban planning problems such as insecurity and a lack of social control (Wassenberg, F. 2018). Newman, O. (1972) drew attention to the no man's land between homes and transport routes (streets) as early as the 1970s. Crime, vandalism, and feelings of insecurity are most common in areas of this type (Elsinga, M. and Wassenberg, F. 1991).

The demographic trends of the housing estates built after World War II in Central and Eastern Europe, and particularly in Hungary, were consistently characterized by the influx of young families with small children. On the one hand, these newly arrived young residents grew old alongside the housing estates, while new young families continued to move in. As time went on, therefore, young families with children and the elderly became the dominant groups in the housing estates (Kovács, Z. *et al*. 2018; Leetmaa, K. and Hess, D.B. 2019).

In presenting the theoretical background, we focus primarily on those groups that are most affected in terms of the safe use of public space in housing estates. This relevance is related to the historical fact that the public spaces under study were predominantly used by adolescents and women, who were the target groups for decades. Currently, adolescents and women (primarily those with young children and/or pensioners) continue to show the most intensive presence in these public spaces.

Access to and use of public spaces have significant social, emotional, and psychological benefits, but these benefits are not evenly distributed among social groups. According to Doreen Massey's relational concept of place (1994), the meaning of places varies across different social positions; that is, a place is not a closed, stable entity, but an open formation consisting of networked relationships, connections, and processes, where these networked relationships also encompass economic, social, and mobility contexts. Public space, therefore, is constantly evolving precisely because of its social openness and changing network of relationships. Moreover, the same space holds different meanings for young people, the elderly, or newcomers, making it not a single entity but a constellation of diverse identities. Public spaces are shaped not only by relationships but also by unequal "power geometry". Since not everyone moves through space in the same way, not everyone has equal access to the resources

of the place – that is, mobility and safety are socially differentiated. The same public space may be perceived as safe by some groups, while others may perceive it as threatening.

This is directly linked to the issue of land use and movement patterns, which reveal how individuals and groups actually use public spaces. In this regard, the issue of perception is crucial, encompassing perceptions, meanings, and experiences related to space, particularly the perception of safety, and fear. Fear is not merely a reflection of crime risks, but a socially and spatially mediated experience. These perceptions directly influence one's relationship to space and determine which places become "places to avoid" or "places considered safe." In this context, fear and perceptions thus manifest in specific behavioural strategies, such as altering routes, avoiding certain places, or restricting the use of public spaces to certain times. These practices can result in a partial restriction of space use, particularly among vulnerable groups – women, young people, and the elderly. A growing body of research indicates that women and young people feel less safe in public spaces than adult men, which significantly affects their movement, presence and participation in urban life (Garcia-Ramon, M.D. *et al*. 2004; Mehta, V. 2013; Anderson, J. *et al*. 2017).

The three defining characteristics – structural conditions, specific modes of spatial use, and perceptions of space – are interconnected through reciprocal relationships: structural conditions shape perceptions, perceptions influence practices of space use, and these practices, in turn, affect both the meaning of space and its structural reproduction (redefinition and transformation) (Soja, E.W. 1996).

Creating inclusive, safe, and visually appealing environments is key to encouraging walking and the use of public spaces, especially for women. Women's walking and space use preferences are fundamentally shaped by gendered experiences of visibility, safety, and belonging. In this sense, walking is not merely a form of transport, but also an act that expresses the right to public space (Pereira, A. and Rebelo, E.M. 2024).

Social relationships fundamentally influence the sense of security. Mixed-use, lively neighbourhoods – according to Jane Jacobs' „eyes on the street" concept – increase social cohesion and perceived safety (Jacobs, J. 1961). Green spaces can help reduce loneliness and promote community connections, which, when carefully planned, indirectly contribute to improving the sense of security among women and young people (Navarrete Hernandez, P. *et al*. 2021; Te Braak, P. and Van Tienoven, T.P. 2025). At the same time, the physical security of public spaces alone does not guarantee their use. The meaning of spaces, their perceived quality, and the opportunities for social interaction play a key role in how women and young people feel comfortable and safe in public spaces. Concerns about personal safety often cause women to modify their routes or avoid using certain places altogether, which, over time, may result in partial exclusion from public life (Valentine, G. 1990; Blöbaum, A. and Hunecke, M. 2005; Polko, P. and Kimic, K. 2022; Zysk, E. 2024; Avar, S. and Karimi, M. 2025).

However, the sense of safety is not solely dependent on crime statistics. It is closely related to gender, age, income status, and the social context of the living environment (Jámbor, V.E. and Vedrédi, K. 2016). The gender safety gap – the difference between women's and men's perceptions of safety – is a persistent phenomenon and is consistent with historical trends (Moore, G. *et al*. 2023). According to this, women and young people consistently report feeling less safe in public spaces, particularly in less crowded areas and after dark.

Women's behavioural responses to fear are shaped not only by fear of violence or crime, but also by the quality of social relationships in their living environment. Avoiding places is often more related to weak social cohesion and a lack of community control than to the actual risk of crime. (Yatesa, A. and Ceccato, V. 2020).

Young people's sense of safety also shows a specific pattern. Girls and young women generally experience a heightened sense of

threat, while adolescent boys are more concerned about physical violence or conflicts between peer groups. Adolescents' use of space is strongly influenced by peer pressure, which determines where they appear and where they avoid (Moore, G. *et al*. 2023). The concept of ‚place as partner' highlights that young people's emotional attachments and space utilisation are in dynamic interaction with built and natural elements.

Despite this, urban planning and regeneration processes are often based on the modernist concept of the 'neutral user', which reflects the perspective of adult, healthy men (Sandström, I. *et al*. 2024). Planning consultations are typically considered to be an "adult space", which marginalises young people, and ignores the emotional and relational experiences that children and young people contribute to the meaning of public spaces (O'sullivan, S. *et al*. 2020; Gutiérrez-Ujaque, D. *et al.* 2025).

The local context in Hungary and Budapest

After World War II, the new state-socialist political and social order in the Eastern Bloc, including Hungary promised equal opportunities for all. Housing construction became a central element of the political narrative of the „welfare state" and affordable housing (Kissfazekas, K. 2022). The new forms of development and the intermediate spaces significantly improved the quality of life compared to the previous, often unhealthy living conditions (Kovács, Z. *et al*. 2018). Housing estates carried the promise of modernity: they were characterised by comfortable, serviced flats, uniform infrastructure, and planned community spaces. One of the central principles was to ensure good pedestrian access to primary institutions of neighbourhood units (schools, kindergartens, shops) and to separate pedestrian and motor vehicle traffic.

In line with the political aspirations and social message of the system, greater attention was paid to equality and the accessibility of shared (state-owned) spaces for all. The main feature of the housing estates was their large green areas, so the housing estates were indeed very airy and breezy. The green areas between residential buildings were planned in detail, with the definition of functional zones, public space elements, and footpaths.

From the time of their construction during the era of state socialism, the public spaces of the housing estate were used intensively. Playgrounds and benches were primarily places for women to socialize (Szabó, B. 2024). The public spaces in the housing estate were considered semi-private spaces, where everyday life was visible and controlled. The users of public spaces were primarily young women supervising small children and walking with babies, as well as children and teenagers without parental control. For children, the public spaces of housing estates functioned as quasi-outdoor living spaces: they could play all day in the spacious areas between the houses, which were mostly free of car traffic (*Photo 1a-b*). After school, it was common to see children hanging out in parks, which were an integral part of housing estate's public parks. Compared to a traditional urban environment, the spaces in housing estates were truly transparent, accessible on foot, and, due to the low volume of traffic at the time and the separate traffic system, they were particularly safe (Navarrete Hernandez, P. *et al*. 2021).

After the political and economic system change in Hungary, the centralised, paternalistic role of the state, which had previously ensured the uniform maintenance, upkeep, and social operation of housing estates, ended (Sýkora, L. and Bouzarovski, S. 2012). Housing estates built in different decades took divergent paths in the housing market following the political transition. The large-panel housing estates of the 1970s found themselves in the most unfavourable position, increasingly becoming part of the lower-middle-class segment of the housing market. Due to the population's lack of capital and the delayed launch of renovation programs, we witnessed a decline in the value of prefabricated housing estates in the 1990s

Photo 1a-b. Housing estates in Budapest. Teenagers are playing without adult supervision in the 1970s. *Source:* Fortepan (ID: 195718; 97523).

(Kovács, Z. *et al*. 2018). The economic transition entailed a transformation of the space utilisation and everyday life in the housing estates (Boros, L. *et al*. 2016; Ouředníček, M. and Kopecká, Z. 2023). The personal relationships and community spirit that had characterised them for several decades since their construction broke down.

As a consequence of the so-called giveaway privatisation in Hungary (sale of apartments at very low prices to former tenants), the housing stock passed into private hands, while public spaces and green areas remained essentially in municipal ownership, generating legal and urban management problems that continue to this day (Van Kempen, R. *et al*. 2005). This determined their fate, as without central state support, they completely lost the resources necessary for their renovation and maintenance. In many cases, this led to the physical deterioration of public spaces, the ageing of infrastructure, and the loss of function of community spaces. The size of the open spaces became disproportionately large in relation to the functions they offered and became underused. They give the impression of being a no man's land, where at most pedestrians pass through to shorten their routes. However, for many people, this is not an option, as crossing large, uncontrolled, and unmaintained areas poses the greatest risk. The sense of security has basically disappeared.

We can conclude that the airy development created in the wake of the former modernist design idea, the freely accessible, flowing community green space, is now in most places synonymous with excess, unused, and neglected areas. This primarily affects the more sensitive groups in terms of public space use, namely, minors regardless of gender and women regardless of age. These are the people who continue to use or would use pedestrian public spaces more intensively at different times of the day. In many places, however, this is now without the protective network of community ties that once existed in public spaces.

Methodological background

Presentation of the sample area

The sample area is the Central Housing Estate of Pesterzsébet in Budapest's 20th district. The formerly independent settlement was annexed to Budapest in 1950. The aim was to create a self-sufficient working-class town centre by modernising and densifying the existing housing stock, with „modern" residential buildings, large green spaces and basic amenities. The central area, built up with existing suburban family houses, was designated for the housing estate. During the construction of the housing estate, some

of the more important historic streets and a few historic buildings were retained (e.g. the Town Hall, built in 1906, and the cultural centre, which has played a significant role in local public life ever since).

The Central Housing Estate was built in three main phases from the 1960s to the end of the 1980s, with the construction of approximately 7,200 flats (*Figure 1*). In the first phase (1960s – marked 1 in *Figure 1*), five-storey houses and ten-storey tower blocks were built. In the second phase (1970s – marked 2 in *Figure 1*), the previous stock of single-family houses was demolished, and 5,000 new flats were constructed in their place. A key element of the uniqueness of the second-phase Scandinavian houses is the system of passageways on the ground floor of the long, articulated residential buildings, which connect to the network of public spaces and park footpaths. In the third phase (1980s – marked 3 in *Figure 1*), the number of flats was increased using large-panel technology. The superblocks are criss-crossed by footpaths leading in different directions, some of which lead to the entrances of the residential buildings, others to important structural points, institutions, and public transport stops.

The market perception of housing estates is well reflected in the trend of average prices for apartments in these estates. In general, we can say that between 2014 and 2025, the market for apartments in housing estates was one of the most dynamic segments of the Hungarian and Budapest housing markets. During this period, housing prices in housing estates skyrocketed, with a 368 percent increase in value in this segment and peaked in the first quarter of 2026 (average price for high-end housing estates in Budapest is around 1 million HUF/m²; approx. 2,600 EUR/m²) (www.otp.hu, 2025). Nevertheless, the unfavourable position of the Pesterzsébet Central Housing Estate in the housing market is reflected in the fact that, at the end of 2025, it was among the housing estates with the lowest average prices in Budapest (650,000 HUF/m²; ap-

Fig. 1. The three construction phases (left), and site plan (right) for the area under study. 1–3 = For explanation see the text. *Source*: Google Maps / Planning archive.

prox. 1,700 EUR/m²). At the same time, the low average price represents a good entry point into the housing market for those with limited financial resources. This unfavourable position in the housing market can also be attributed to the fact that, according to the FHB Family-Friendly Neighbourhood Index, Pesterzsébet has traditionally been among the least family-friendly residential areas in Budapest (www.mbhindex.hu, 2016).

The population of the Central Housing Estate of Pesterzsébet is 16,500 (2022), which is 26 percent of the district's population. The housing estate is characterised by unfavourable demographic trends. The population is declining, the proportion of elderly people is higher, and the proportion of children is lower compared to the district's indices, and there is a much higher proportion of single-person households. On the positive side, the unemployment rate in the housing estate is low (2.4%). The more educated, wealthier, and older segments of the population live in the southern part of the housing estate, while the younger, less educated, and often unemployed segments of the population are found in the northern part of the housing estate. It is no coincidence that newcomers to the housing estate also prefer the central and southern residential buildings.

Research methods

Between 2022 and 2025, the research team conducted extensive empirical studies in the case study area to explore and evaluate the characteristics of public space use and the quality of the living environment in the sample area. The methods used were as follows:

1) Online and face-to-face resident questionnaire survey.

Between March and September 2025, the research team surveyed the mobility habits of the local population, their perception of the housing estate and the state of (public) safety in the living environment. We posted the online survey on social media platforms, while the offline surveys were conducted at public institutions (e.g. libraries) and through street interviews. The questionnaire included single-choice and multiple-choice questions. During the survey period, a total of 143 online and 123 offline questionnaires were completed, primarily using a convenience sampling method. From a methodological standpoint, the sample is not representative; however, from a statistical standpoint, it approximates the 2 percent sampling size typically used in microcensuses, so the results obtained can be considered relevant.

2) Walking interviews (in-depth field interviews).

Between March and May 2025, we conducted in-depth field interviews with residents using a random stop method. The walking interview method reduces barriers to participation, moderates power imbalances between the researcher and participants, and provides opportunities to observe participants in their familiar environments (Evans, J. and Jones, P. 2011). The conversations were digitally recorded, transcribed, and then subjected to content analysis. The route taken during the conversation was recorded using the STRAVA application. As part of the survey, 49 walking interviews were conducted, with an average route length of 3.2 km, and an average interview length of 94 minutes. The questions covered ways and habits of using public spaces, as well as concerns, fears, and positive experiences related to life and the environment in the housing estate.

3) Fieldwork – mental map and route mapping survey, pedestrian space utilisation.

On 5 September 2025, on a typical school day between 12:00 and 17:00, at the end of kindergarten and school activities, we conducted a route mapping mental map among children and young people with the help of 28 architecture students. The survey was carried at 1 kindergarten, 2 primary schools (7–14 age group), one specialised music school, and one combined primary and secondary school (ages 7–18).

With the help of the university students, the respondents drew their main walking routes on a sketch map of the housing estate and marked the places to be avoided. We

then compiled the on-site route sketches on a shared map. Using educational institutions as starting points, we drew the dominant routes used by young people daily. The routes taken by young people travelling alone and with their parents are marked separately. A total of 90 respondents' pedestrian mobility routes were mapped using this method.

4) Public workshops – drawing data for community planning.

In March and September 2025, we conducted two public workshops using interactive mapping to assess residents' opinions on the use and perception (good and bad places) of locations in the housing estate. The workshops were preceded by two months of preparatory work, during which the research team defined the empirical tasks to be carried out (the objectives, methodology, and implementation of the use and perception surveys) and assigned responsibilities, developed the marketing strategy, and put together the workshop program. We publicized the program on municipal and public online platforms, in local newspapers, and on advertising platforms. A total of 78 residents took part in the workshops, and a further 20 residents later commented on the aggregated results with the help of moderators.

Thanks to the combined methodology, we were able to gain a comprehensive understanding of various aspects of the housing estate environment (e.g. questionnaire survey – mobility characteristics; mental mapping, route drawing, and walking interviews – space usage preferences and characteristics; workshops – perceptions of public space). The objectives of the methods used, as well as their target groups (participants and relevant stakeholders), differed, so the results of each method complemented one another well *(Table 1)*. Thus, the basic information obtained from the public survey was effectively supplemented and enriched by the results of fieldwork, public activities held during the workshop, and walking interviews.

Results

Our basic hypothesis was that large, contiguous but unsupervised green spaces are avoided by women and young people walking alone, even if shorter.

Table 1. Summary table of applied methods

Methods	Objective	Target group	Implementation method	Date / duration	Participants / respondents
Residential questionnaire survey	Assessing mobility habits and characteristics	Local residents	Online and in-person residential questionnaire survey	March–October 2025	266 respondents
Field research – mental mapping and route drawing	Identifying pedestrian space-use preferences	Children and young people from local educational institutions	In-person collaborative drawing sessions involving architecture students	5 September 2025	119 participants
Community workshops	Assessing local perceptions of public spaces	Local residents	Two workshop sessions	March and September 2025	78 + 20 participants
Walking interviews	Understanding public space use habits and their underlying reasons	Local residents	In-depth interviews conducted while walking	March–May 2025	49 participants

Source: Authors' own elaboration.

Figure 2 shows the responses of the entire sample without breakdown by gender and age. The lack of public safety in housing estates was often mentioned as a negative factor in public discourse and street interviews. Residents cited a wide variety of reasons for this, ranging from the presence of drug users to vandalism. However, criticisms regarding public safety were not reflected in our questionnaire survey results: respondents rated the safety of their neighbourhood as moderate.

Respondents rated the immediate vicinity of their homes as the safest in terms of public safety, which can basically be attributed to their knowledge of their immediate neighbourhood and community, and the trust based on personal relationships. Public spaces (parks, playgrounds, and car parks) also received very good ratings in responses. Thanks to strong and targeted central support over the past decade, the infrastructure (equipment, condition) and supervision (mostly fenced and well lit) of Hungarian playgrounds has been of a much higher standard than that of other public spaces. All this has, of course, resulted in positive developments in the areas of safety, and public security. Criticism of the safety of public transport stops was raised several times in the walk-through interviews. This is also less reflected in the results of the entire sample, although respondents undoubtedly feel less safe there than around the entrance to their own home or in public spaces in general *(Figure 3)*.

Figure 3 also reveals the pronounced differences – discussed in detail later in the paper – in perceived safety between male and female residents, which are associated with their differing life situations and everyday experiences.

The results broken down by age show that respondents are generally not concerned about public safety in the housing estate. All

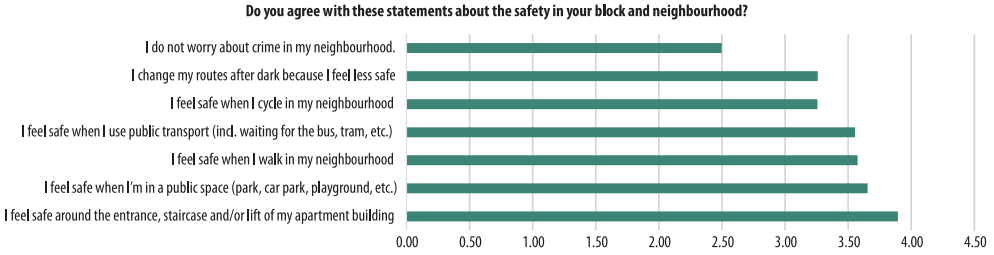

Fig. 2. Assessment of the safety of housing estates and public spaces in the entire sample, n = 266.
Source: Authors' own compilation.

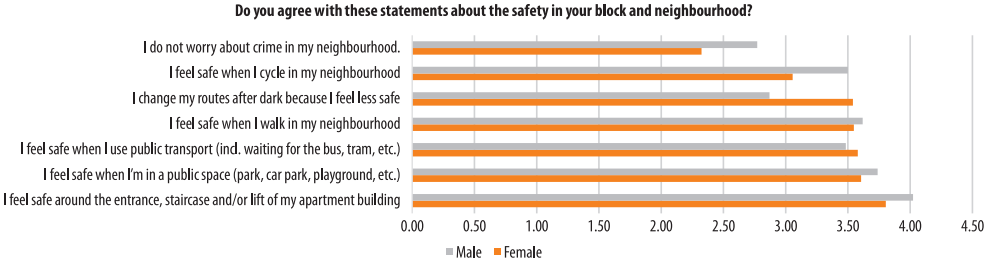

Fig. 3. Assessment of the safety of the housing estate and public spaces by gender, n = 266.
Source: Authors' own compilation.

age groups consider the immediate surroundings of their residential building to be the safest, and respondents also consider parks and public spaces to be particularly safe.

Despite widespread stereotypes, the oldest age group, those over 65, feel the most secure compared to other age groups. Our findings are consistent with international findings and provide strong support for them (Köber, G. *et al*. 2022). The higher sense of security among the oldest age group can be attributed to the fact that this group was the first to move into the housing estate after it was built, and they have essentially grown old together with the estate. Due to their age, they are a group with a high degree of local knowledge and extensive personal and social connections. Their sense of security is closely linked to the place and the higher sense of security they have become accustomed to in previous decades. Their personal acquaintances and social relationships are also likely to be stronger than those of younger people, as they have decades of history behind them. The values of the under 25, and over 65 age groups are similar in many cases. These results deserve greater attention because these are the age groups that do not travel exclusively for specific purposes in public spaces and residential areas. The 26–65 age group reports the lowest sense of security in all examined. Our results therefore, did not support our basic hypothesis that the sense of security among young people (under 25) and the elderly (over 65) would be the lowest *(Figure 4).*

When examining the responses by gender, fundamental differences between the opinions of men and women in the entire sample become apparent in questions concerning the safety of housing estates and public spaces. *(Figure 5a-f).* The differences between male and female perceptions are clearly visible. With one exception, the sense of security among the women surveyed is noticeably lower than that of the men. The exception is the sense of security experienced in the vicinity of public transport stops, as mentioned above. This is obviously due to the presence of other people, and public lighting. It is not surprising that the most striking difference between the sexes is in their assessment of their sense of safety after dark (3.54 for men versus 2.87 for women).

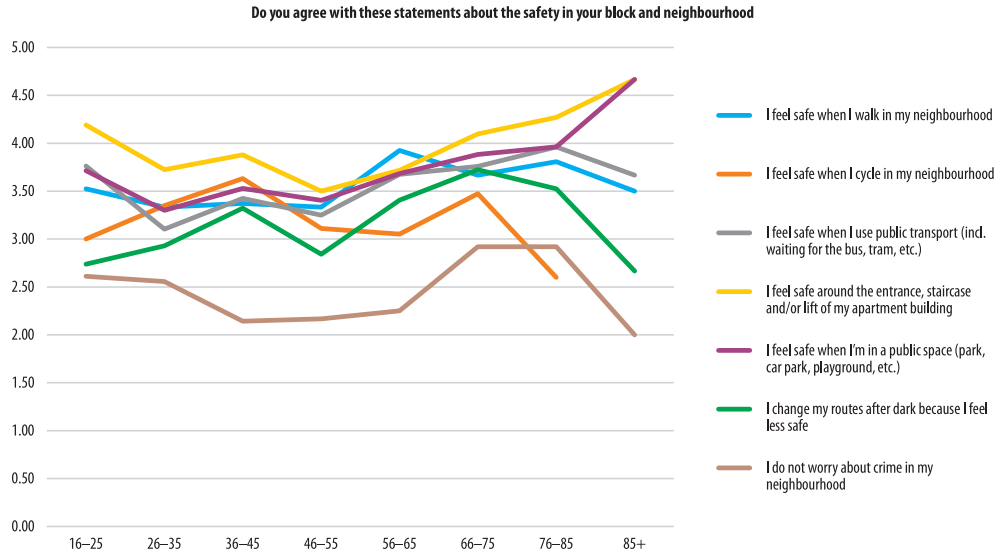

Fig. 4. Assessment of the safety of housing estates and public spaces by age, n = 266.
Source: Authors' own compilation.

Fig. 5a-f. Assessment of sense of security based on gender and age groups, n = 266.
Source: Authors' own compilation.

In the case of women, the differences between age groups are also striking. Women under the age of 35 feel significantly less safe than men and women in other age groups.

Our findings support our assumption that the public spaces in housing estates, which were traditionally used and dominated by women without fear before the change of regime, have now lost this characteristic in post-socialist conditions. For young women, the housing estate environment increasingly represents an uncertain and less safe living environment.

The results of the walking interviews corroborated the findings obtained through other methods. The interviewees are generally satisfied with the opportunities offered by the housing estate environment; however, the use of public spaces and the sense of safety (a decline in the subjective sense of safety, an increase in feelings of insecurity, especially in the evening hours) mean that the quality of urban life is problematic in many cases. One reason for this is that the attitudes of young people, and older residents toward public spaces differ and are often in conflict (e.g. the use of benches and playgrounds). These factors also contribute to the decline in pedestrian traffic.

The main lesson to be learned from the results of the study mapping pedestrian routes is that respondents practically only use traditional streets between school (work) and home *(Figure 6)*. Despite the extensive pedestrian network and shorter routes, they are reluctant to walk through parks. Women walking their young children and young people travelling alone prefer streets with heavy motor vehicle traffic to the protected internal roads designed specifically for pedestrians, of which there are many in the area *(Figure 7)*.

The results of community planning in public workshops support our earlier findings regarding pedestrian routes. In other words, participants essentially only evaluated traditional streets in tasks related to both the frequency of space use and public spaces and places considered good or bad. *Figure 8* and *9* show the paths and public spaces within residential blocks that appear for pedestrians as blind spots. The bad places are basically linked to the busy main road passing through the area. The good locations are concentrated along the historic main street (Kossuth Lajos Street) that was retained during the construction of the housing estate. It stands out among the most visited places during the week as well. The popularity of the main street is not due to its lack of traffic or shopping opportunities, as a significant part of the housing estate is traffic-free, and the shops sell cheap mass-produced goods. As a traditional street, the main street represents history, tradition, and local identity. Its popularity is, in many ways, a critique of the modernist housing estate environment.

To sum up, in the local community, middle-aged people tend to have a negative attitude towards the sense of security and public safety in relation to the housing estate and its public spaces, while the oldest age group has a positive attitude. In terms of gender, women are clearly less satisfied with public safety. The most vulnerable group is young to middle-aged women, who have the lowest sense of security and are the most critical of public safety in the housing estate. As a result of changes in the state of public spaces and a decline in the subjective sense of safety (primarily a sense of insecurity), pedestrian traffic is on the decline and is increasingly shifting to major thoroughfares, avoiding the previously safe, traffic-free routes and public spaces. The use of public spaces is becoming increasingly contentious, thereby diminishing their community-building and cohesive nature.

Discussion

In our historical overview, we showed that during the communist period, the built and public spaces of housing estates presented a much more inclusive environment. The decline in inclusiveness is closely related to differences in perceived safety among various social groups and the resulting differences in spatial practices. Inclusion depends not only on physical access to public spaces, but also on the extent to which these groups

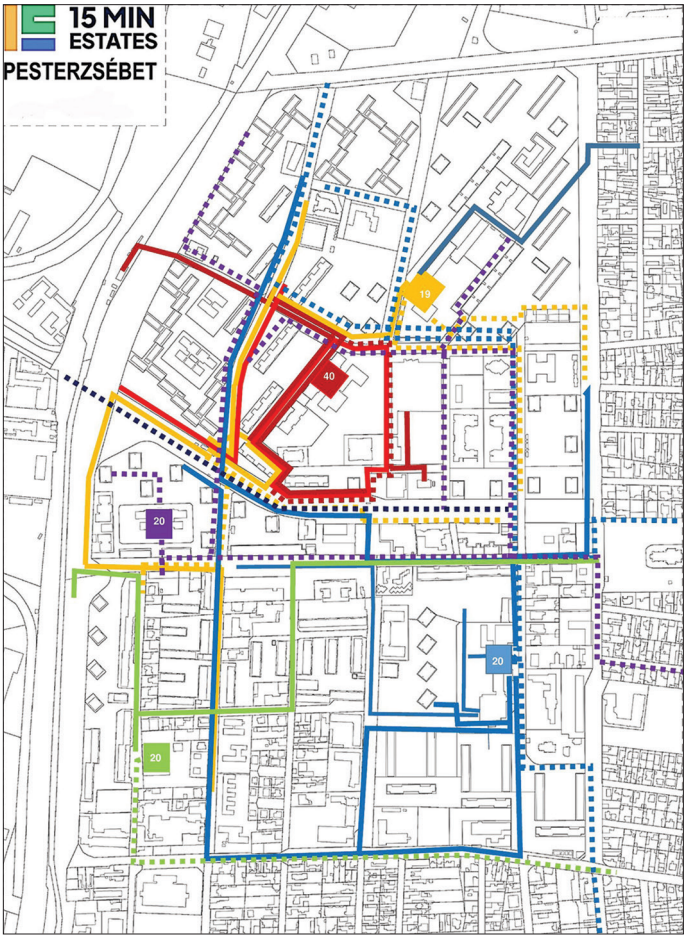

Fig. 6. Preferred pedestrian routes, n = 119. Different coloured squares on the map: Schools and kindergartens included in the survey with the number of respondents. Preferred routes from kindergarten/school children accompanied by parents (doted lines with different colours), versus uncompanied minors (solid lines with different colours). *Source*: Authors' own compilation.

feel safe and comfortable when using such spaces in their everyday lives. In the decades preceding the change of regime, housing estates proved their suitability for improving the quality of life of the local community and their ability to function as an inclusive environment (see also Van Kempen, R. *et al*. 2005).

According to our findings, housing estates and their public spaces are not inclusive environments in terms of how the population uses space today. The results of the walking interviews revealed that the development of public spaces has not kept pace with the challenges of the modern era, leading different generations to use the available space in different ways, which in turn leads to intergenerational social conflicts (see also Levin, I. *et al*. 2014, and Grundström, K. and Lelévrier, C. 2023). Several theories exist for resolving such conflicts; however, due to the local context, neither the nested commons theory (community-based management of the area – Li, W. and Kerven, C. 2024) nor gentrification (or, more precisely, in our case, the lack thereof) can provide a solution to these con-

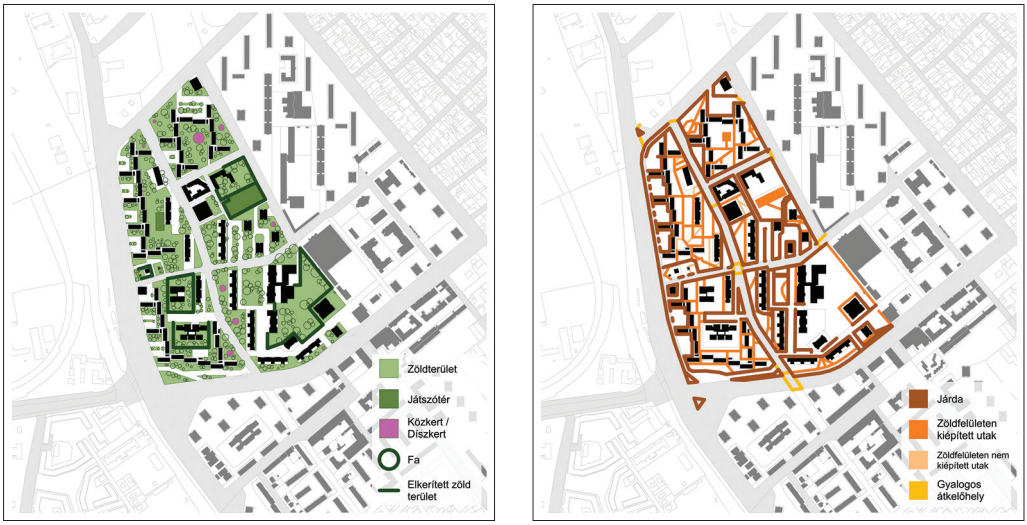

Fig. 7. Green space system (left), and extensive pedestrian network (right) within the block. *Source*: Architecture student Borbála Balasi.

flicts. However, adapting the Swedish "smorgasbord of places" model could represent a step forward, as it has gained traction amid hostility toward shared public spaces in residential urban areas (Warwick, E. and Lees, L. 2022; Biddulph, R. and Sandberg, M. 2024). Under this model, the network of public spaces would be used by the relevant social groups according to a defined, informal set of rules.

Results of the questionnaire survey show that the general sense of security in public spaces in housing estates is favorable and that the assessment of public safety is generally positive, and the difference between men and women is less pronounced in the under-25 age group. Perceptions of safety are also positive among the older age group. However, sophisticated results of the qualitative methods testified that women, young people, and parents with small children in particular avoid the internal pedestrian routes that cut through housing estates and prefer traditional streets with heavy motor vehicle traffic.

Feelings of exclusion and insecurity are also generated by the poor model of space use. Public spaces that give the impression of being abandoned and underused increase the feeling of insecurity and further select the circle of space users, excluding more vulnerable groups (Perrigo, J.L. *et al*. 2025).

Our findings call into question the success of the design intention often used and emphasised in the construction of housing estates, namely that protected routes and pedestrian networks contribute to improving the quality of life in housing estates. The carefully planned, segregated traffic system and protected green spaces of housing estates have now lost their community-building role. The loss of function of previously intensively used community spaces, the lack of personalisation, and the weakening of social relationships directly contribute to a deterioration in the sense of security, especially among women. International research clearly supports the view that fear-related behaviour patterns stem not primarily from an objective fear of crime, but from weak social cohesion in the residential environment (Ferraro, K.F. 1995; Sampson, R.J. *et al.* 1997).

Returning to the questions posed in the introduction, the public spaces of housing

Fig. 8. Notable places of space utilisation on an average weekday and a weekend day. Time spent on an average weekday (yellow), and on an average weekend day (blue), n = 78. *Source*: Co-Housing Budapest Association and authors' own compilation.

estates, which were once designed and used with a strong sense of community, have lost their former positive, integrating role in our case. This process was one of the consequences of the end of state socialism. The ownership structure changed, and the population shift intensified after the change of regime (Gorczyca, K. 2016). The wealthier younger generations moved away and were replaced by lower-middle-class young families with small children in a kind of a reverse gentrification. With the end of the intensive use of public spaces, community control over public areas faded out. The fluctuation within housing estate communities significantly reshapes the cohesion of the local community. The cohesion is lacking among the newly arrived, often transitory population (Haase, A. *et al*. 2012). As a result of changed social habits, newly arrived groups typically use public spaces only for transportation. But they don't do this as freely and intensively as the morphology of the development and the logic of the internal functional layout of

Fig. 9. Location of good and bad places in the housing estate. Good places are marked with green, bad places with red, n = 78. *Source:* Co-Housing Budapest Association and authors' own compilation.

the area would dictate. Or as was originally the case in the first decades after the housing estate was built. Thus, the small number of pedestrians passing through further exacerbates the marginalisation of public spaces.

The spatial openness of the development and public space system, designed according to modernist principles, is a great advantage. The ownership situation, whereby the public spaces are still owned by the local council, is also a good opportunity. The potential inherent in these is exploited in few housing estates (Ouředníček, M. and Kopecká, Z. 2023).

The development of large, unstructured, often poorly controlled, and therefore unsafe public spaces into areas with specific uses (outdoor barbecue, community garden, playground for teenagers, etc.) has several advantages. Community content can return to public spaces that are increasingly becoming „no man's land", allowing these areas to regain their community-building and strengthening role, thus, allowing a responsible and caring attitude to regain ground. The impact of community control over public spaces that are put back into use can also spill over into the wider environment. By putting the area back into use (revitalising it) and filling it with living functions, control and, through this, public safety will also improve (Friedrich, K. and Rössler, S. 2023).

Conclusions

Over the past two decades, research on public spaces has increasingly become a focal point of urban studies. In the case of housing estates, the condition of public spaces plays a particularly significant role, since public spaces significantly determine the housing market situation of housing estates. The design and organisation of public spaces fundamentally influence the image formed by those living in and outside the housing estate (Sendi, R. *et al.* 2009). The condition and use of public spaces fundamentally influence residents' opinions about the quality of life. Improving public spaces and promoting their use encourages residents to participate more actively in local community life, while also improving the health and well-being of the population (Raswol, L.M. 2018; Yussuf, S.O. *et al*. 2021).

The fundamental aim of our research was to examine how the freely accessible, open to all, and, in the past, truly inclusive public space system, which was realised through modernist architectural ideas and state socialist urban development, functions today. Do public spaces still provide equal opportunities for users of different ages and genders in their current use, as was typical at the time of their design? Can the original design intent still be realised?

Returning to our research questions, our findings indicate that the use of public spaces in housing estates underwent a significant transformation following the political transition. In Hungary and Budapest, the community-building role and community-forming power of public spaces gradually faded in the large-panel housing estates of the 1970s. This process was particularly characteristic of prefabricated housing estates in unfavourable housing market positions, such as the Pesterzsébet Central Housing Estate, where the unfavourable real estate market situation is coupled with a less family-friendly environment. Social conflicts have emerged regarding the use of public spaces (the coexistence of young and elderly residents), and the active use of public spaces by mothers with young children, a characteristic of the area for decades, is on the decline or is often spatially restricted or increasingly limited.

The transformation and decline in the use of public spaces can be attributed to a decrease in the sense of security and an increase in the sense of insecurity. These problems are particularly evident among young and middle-aged women. Avoiding enclosed indoor spaces and less-trafficked streets– previously hailed as major advantages – has emerged as a defensive mechanism. The mobility of young people, and mothers with small children has increasingly shifted to the vicinity of major transportation routes, which runs counter to the original design objectives of the housing estates.

In order to improve land use, we recommend developing a target group-centric strategy based on the needs, fears, and opinions of the most vulnerable groups (young and middle-aged women). The active involvement of women and young people in planning processes can also bring specific spatial design considerations into the scientific and urban development discourse that are irrelevant to other members of the community (e.g. good lighting, informal supervision, transparent spaces, visual control, specific planting considerations).

In the longer term, developing a comprehensive urban regeneration strategy for the area –one that aims to revitalize the physical, social, and economic environments collectively – could represent a step forward. Improving the quality of green spaces could play a key role in the physical renewal of public spaces, while in the social sphere, the use of "smorgasbord of places"-type interventions could offer a solution. By developing services located on the ground floors of housing estates, we can achieve not only economic benefits but also advantages in terms of land use (mobility). Moreno's interpretation of the 15-minute city concept in a housing estate environment highlights that liveable and safe public spaces are not merely the result of physical interventions but are closely linked to the functioning of local communities and the strength of social relations (Moreno, C. 2024).

The solution to this situation lies in a two-pronged approach. On the one hand, there is a need for bottom-up development that takes into account the needs of the local community, and on the other hand, there is a need to integrate and moderate from above the potential and social capital inherent in the local community (Lang, R. and Novy, A. 2014). In this way, public spaces – which are increasingly coming to resemble no man's land – can once again become liveable areas that serve a community purpose.

We plan to conduct further research to explore in more detail the use and needs of minors, young children who already travel alone, and young adolescents. Future preference studies allow to map the various needs of public spaces from multiple perspectives (age, gender and function). Our research can contribute to identifying future trends in the use of public spaces in housing estates.

Our findings have highlighted the need to rethink the top-down planning approach that remains prevalent in Central and Eastern Europe. Instead of paternalistic, state-led "welfare" developments, greater attention must be paid to underutilized local resources and better harnessing the potential inherent in local society, as well as to closer cooperation with local communities.

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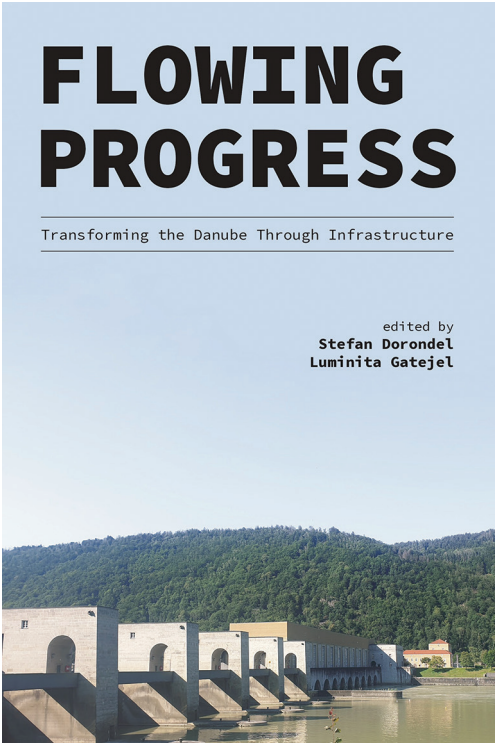
BOOK REVIEW SECTION

Dorondel, S. and Gatejel, L. (eds.): Flowing Progress: Transforming the Danube Through Infrastructure. West Lafayette, Indiana, Purdue University Press, 2025. 324 p.

Flowing Progress is a unique and fresh compilation of studies on the environmental history of river Danube from the 16th to the 21st centuries featuring an exciting theoretical framework. The book's premise (p. XI) is that the development of modern water infrastructure is not only a catalyst for physical and ecological change, but also a civilizational achievement and a political and economic instrument of power that interacts with the local population and the natural environment. The ten studies in the book provide strong evidence of this, as they explore modernization processes, the relationship between water, power, and the environment, and the connections between various levels – local, regional, national, and international – through the history of dams, bridges, power plants, and other elements of infrastructure.



Despite the title *Flowing Progress*, the chapters are not *in-progress* reports of research but finished works with a clear narrative. Although the term *flow* plays an important role in the book, the key concept is *disturbance*. Therefore, the title of the introduction fits better to the whole volume: *Disturbance. Danube River, Infrastructure, State*. This original term, disturbance, recalls Fernand Braudel' s longue durée perspective (Braudel, F. 1958), where the long-term natural balance is suddenly disrupted – or disturbed – by man. A disturbance is a relatively rapid process (which may even be a cataclysm, e.g. a flood) that causes the landscape and ecosystem to be reorganized. Going beyond this approach, the editors of the volume, Stefan Dorondel and Luminita Gatejel, emphasize that disturbance is not a one-way process, but rather a circular interaction between hydrological processes and technopolitical and economic practices (p. 3). This is closely linked to the concept of the *socio-natural site*, which delineates the landscape of the co-evolution of nature and society. Two senior researchers, Verena Winiwarter and Martin Schmid used this term describing the Austrian section of the Danube (Winiwarter, V. *et al.* 2013, 2020), and their work can be regarded as a direct precursor to the current volume. Moreover, Schmid, in collaboration with two co-authors, Gertrud Haitvogl and Severin Hohensinner, contributes a study to *Flowing Progress* as well, emphasizing the autonomous role of technological systems, independent of social and ecological ones, in the disturbance (p. 270).

The editors highlight three key aspects of the research: natural and politico-economic dynamics, multiple scales, and flow. We can also distinguish a premodern and a modern era: from the second half of the 19th century, the construction of state infrastructure – driven by the capitalism, and the fossil-fuel-powered machinery (p. 268) – had a far more radical impact on the Danube's water flow than previously. The creative interpretation of the term flow– which is etymologically related to flood (in German: *Fluss*) – also appears in the dichotomy of discontinuity and continuity, and of the human and the natural. The concept of disturbance goes beyond mere description and is suitable for highlighting the agency of the river, as well as for connecting premodern and modern re-creation of the landscape, to demonstrate that modernity is not necessarily a new, unique phenomenon (pp. 11–12). Infrastructure itself can be examined from numerous

perspectives, it possesses both semiotic and aesthetic dimensions as Brian Larkin's paper *The Politics and Poetics of Infrastructure* emphasizes which is cited in several chapters (Larkin, B. 2013).

A difficult task of editing thematic volumes is to ensure cohesion among the individual studies. The editors have done an excellent job in this regard: the concept of disturbance appears in almost every chapter, and they are linked by numerous cross-references, too. Although numerous new river histories were published over the past two decades (Evenden, M. 2018), the Danube has remained in the background of research compared to many other international rivers, partly due to linguistic difficulties. This volume features studies based on primary sources and presenting new findings from researchers working in seven countries. Although the book's subtitle (*Transforming the Danube Through Infrastructure*) highlights the entire river, the volume focuses on the Lower Danube, specifically the section between Belgrade and the Black Sea: six of the ten studies deal with this area. The volume is based on two completed research projects, both focusing on the Lower Danube. One of them was supported by the Leibniz Institute for East and Southeast European Studies (IOS), Regensburg (Contested Waterway: Governance and Ecology on the Lower Danube, 1800–2018), the other by the Romanian Ministry of Research and Education (State, Communities and Nature of the Lower Danube Islands: An Environmental History, 1830–2020). The editor Stefan Dorondel, lead researcher at the Francisc I. Rainer Institute of Anthropology of the Romanian Academy, has an unusual pair of doctoral degrees: one in history and ethnology, and another in agricultural economics. This also shapes his interest in the post-socialist agricultural transition and its environmental implications. The other editor, Luminita Gatejel, senior researcher at the IOS, published a book recently about the technological and imperial cooperation at the Lower Danube. Although none of the editors has a research profile focused exclusively on environmental history, and only a minority of the authors identify themselves as environmental historians, the theoretical framework presented and the agency of the river makes places this volume in the field of environmental history. The book is organized logically: the chapters are in chronological order, followed by two studies connecting premodern and modern times. Formally, this book is a well-done work: the layout is aesthetic, and there is a useful index at the end.

The first study examines two cases – the 1566 siege of Szigetvár (Hungary), and the 1579 reconstruction of the three bridges at Turnu Măgurele (Romania) – to illustrate how the Ottoman Empire utilized the Danube in various situations. The two authors, Deniz Armağan Akto and Onur İnal, argue that the Ottomans did not seek to transform the rivers, but rather operated by adapting best practices from other parts of the empire to local conditions and through interactions with the local population. For example, the population of Turnu Măgurele participated in the construction and maintenance of bridges at the request of higher authorities, and at the Iron Gate – a critical narrow part of the Danube for navigation – they established a special office called *whirlpool chieftain* to ensure the safe passage of ships. Applying the concept of the socio-ecological system allowed us to gain a deeper understanding of the environmental aspects of using the river.

In the second study, Luminita Gatejel demonstrates how, in the 1830s and 1840s, state officials in Wallachia after the strict Ottoman rule, and the city leaders of Giurgiu, situated in a strategic location along the Danube, reshaped the waterfront. After the Russian army demolished the walls of the city's Ottoman fortress in 1829, the path to modernize the city was opened. From the perspective of the Danube, this was shaped by floods and state flood control measures, while the new embankment also became part of the modern city's public infrastructure, thus, restructuring the relationship between people and the environment through disaster management infrastructure. The transition between the premodern and modern eras is indicated by the fact that technical know-how and administrative reforms transformed the principality into a modern bureaucratic state.

The following third chapter, by Constantin Ardeleanu, examines the operations of the European Commission of the Danube (ECD) and the State Fisheries Service (SFS) in the Danube Delta at the turn of the 20th century, as seen through the work of two leading engineers. Although political interests prevented direct competition between the two "hydraulic missions" before World War I, their differing perspectives became sharply evident in the management of Lake Razim, located near the Black Sea coast. The ECD, an "imperial technopolitical organization", prioritized shipping, while the SFS, a "technonationalizing project", preferred fishing because of food security. The latter relied on the ECD's maps and surveys, which shows that, despite their opposition, both similarly represented the nature-transforming, high-modernist agenda. It would have been also interesting to compare the operations of the two organizations based on additional criteria, such as the nature of their operations and the ways in which they advocated their interests to the Romanian government.

The following two studies focus on the period between 1918 and 1945. In the fourth chapter, Steven Jobbitt demonstrates how hydrogeographical and water management arguments were used to support the cause of Hungarian interwar revisionism. Hungarian geographers and hydraulic engineers, in fact, described the Treaty of Trianon as a natural disaster or disturbance. According to their arguments, the unity of the Danube's and – especially the river

Tisza's – watersheds the main river of the eastern part of the Kingdom of Hungary prior to 1918 – as well as the water management works carried out, entitled post-World War I Hungary to possess these territories. The presentation of Hungarian water management developments in the 19th century is quite lengthy, and its main point is only stated at the end of the study: the river regulation primarily served the agricultural interests of large landowners. Jobbitt points out that, due to the new borders, most of the Hungary's river water came from abroad, thus, leaving the country vulnerable. The quoted 1930 newspaper article, which compares the situation of Budapest's drinking water to the Treaty of Trianon, is fascinating.

Stelu Șerban's study examines the impact of the March 1942 Danube flood in the Vidin region, based partly on interviews. The most significant part of the story is the recovery: despite World War II, the immediate action taken by authorities and leaders enabled the state to strengthen its weak position in the region, for a long time. The aid made no distinction on ethnic grounds, and involved personal sacrifice, not only at the local level but also to the government. Petar Gabrovski, the minister of internal affairs and public health, and his officials personally donated large sums toward reconstruction. Șerban explains this through the theory of the *affective state* derived from colonial studies, which, building upon Max Weber's concept of the rational functioning of the modern state, emphasizes the acquisition of control through emotional attachment (Stoler, A.L. 2007). A key aspect and an interesting development in the research are the examination of how various actors describe the flood: as a neutral, tragic, typical, or unique phenomenon.

Two studies focus on the Cold War period. In the sixth chapter of the book, Robert Nemes investigates the local effects of the 1956 Danube flood in Hungary in the village of Dunavecse, primarily based on newspaper articles. Although no shared narrative emerged, local, regional, and government authorities attempted together to regain control over nature. This, combined with the size of the catastrophe, resulted that for the people of Dunavecse, the flood is more memorable from that year than the anti-Soviet Hungarian Revolution. In this chapter, as well as in the previous one, it could have been fruitful to use the theory of disaster history (Oliver-Smith, A. 2002; Holm, I. 2012) and possible analogies of catastrophes (e.g. Hall, A. 2011).

Constantin Iordachi explores the history of the Danube–Black Sea Canal, in the Danube Delta. Although he also adopts the concept of socio-natural site, he proposes the concept of *industrialized nature* as an alternative to the dichotomy between society and nature. He distinguishes the history of socialism from that of global infrastructure through four points: ideology-driven social engineering, the adaptation of earlier Western developments, the prioritization of quantitative industrial growth, and a lack of efficiency. The accompanying photographs are revealing, as they simultaneously depict the various eras: the pre-1945 era, the structures of socialism, and those of post-socialism—the text could have devoted even more space to these photos. An important connection to Ardeleanu's study, that during the Cold War, the European Commission of the Danube was followed by two commissions, an Eastern and a Western one. While during the socialist era – similar to Ardeleanu's chapter – the structures in the Danube Delta were established as imperial projects, the new post-socialist projects were not: they were launched in response to the old ones, and the conservation perspective opposing industrial use became increasingly significant, as in the case of the Văcărești Natural Park in Bucharest.

Stefan Dorondel writes about the April 2006 flooding of the Danube, which destroyed 115 houses in the Romanian village of Rast. This ethnographic study commendably employs the concept of natural disaster (Oliver-Smith, A. 2002), The main research methods are fieldwork and interviews, during which the author ingeniously had the participants draw the flood's path on a map. His concluding observation is that the new infrastructure built after the disaster does not alleviate but rather exacerbates the tension between people and the river.

The last two studies provide a comprehensive overview. In the ninth chapter, Milica Prokić examines the Great War Island, an island in Belgrade, from the 16th century to the present day. Since the island's function, size, and shape have all constantly changed throughout history, she suggests the framework of amphibious anthropology to address the land–water binary. This explains the near-total absence of infrastructure – making this chapter something of an oddity in the book. Once of military significance in the early modern period and bombed several times in the 20th century, the island is now an "urban oasis" in the Serbian capital.

The last chapter by Gertrud Haidvogl, Severin Hohensinner, and Martin Schmid is also unique: it is the only one that focuses on the Upper Danube, and it perhaps makes the most profound use of the concept of disturbance. It emphasizes the critical role of infrastructure, which also leads to undesirable path dependency, Based on a long-term overview of the transformation of three areas–the Danube in Vienna, the Machland, and the river Traisen, tributary of the Danube. The study identifies three zones along the rivers. First, the river's most frequently used channel, which also serves as a navigation corridor, alongside mill canals were built in premodern times. The second is the constantly changing riverbank, which was radically transformed by floodplain colonization beginning in the second half of the 19th century. The

third consists of nearby, dry, higher elevations—the traditional sites of settlement. In the second half of the 20th century, large dams and hydroelectric power plants aided river regulation: in cities, people, thus, moved closer to the riverbanks, and the value of their properties increased. With the narrowing of the floodplain, floods grew once again, and the cyclical process between nature and infrastructure continued.

As we have seen so far, one of the book's strengths is that the case studies, in most instances, offer conclusions not only for the micro, but for the macro level, and even suitable for comparison. In several instances, there is also an intention for a global perspective; however, in the absence of adequate context and explanation, this seems forced. Examples include the mention of globalization among the transformational drivers in the transformation of river landscapes by technological systems (p. 289), or "globalizing infrastructure" in connection with the 19th-century Danube (p. 6). When considering potential global implications, it is worth noting two important limitations. The first is that the primary physical boundary of a river's influence is the edge of its watershed. The other is that the book focuses on certain areas of Central Europe and the Balkans, whose states were not directly involved in the colonial competition and, thus, did not play a central role in the global flow of ideas, knowledge, and technology related to water engineering. The editors also use the term "flow" to refer to the movement of things other than water, but this leads to an irrelevant discussion of flow as a metaphor for globalization (pp. 7–9). The book's introduction concludes with a warning about the future, particularly regarding megaprojects. In 2014, approximately 3,700 hydropower plants were in the planning stages or under construction, which could lead to numerous serious ecological and social consequences, some of which may be unexpected. It should be noted that since the 1980s, social resistance strengthened globally (Kanjeev, S. 2015), and several reserves are being established to protect the natural environment and ensure its sustainable coexistence, such as the Văcăreşti Natural Park. Overall, however, the book is not a warning book but rather a guidebook that introduces readers to the environmental history of a region that has received little attention until now. The Danube, as an international river, provides a good opportunity for comparison, and the editors have taken full advantage of this opportunity to produce a volume that is well-focused on its subject. We are confident that the approach they have taken will inspire further research.

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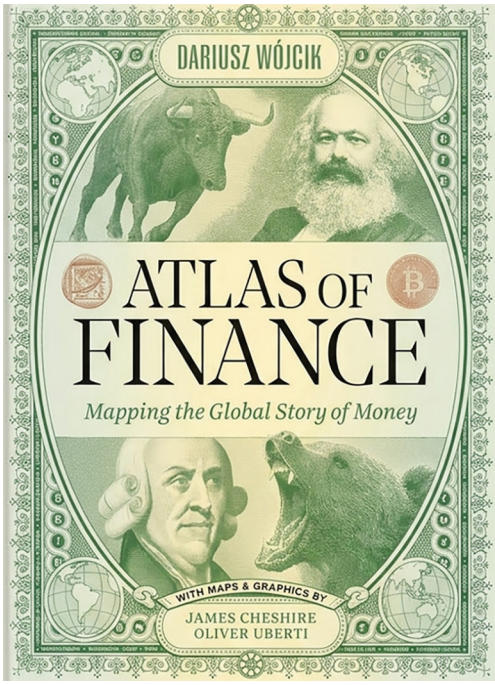
Wójcik, D.: Atlas of Finance: Mapping the Global Story of Money. New Haven–London, Yale University Press, 2024. 240 p.

In *Atlas of Finance: Mapping the Global Story of Money*, Dariusz Wójcik describes global finance with a traditional method of using maps, graphics, and data visualisation. Together with his team and nearly 200 Oxford student interns who helped with visualisations, they have created one of the most labour-intensive projects. The book is a great contribution to the geographical literature, filling the gap in the market – and on bookshelves by uniting money and maps, finance and geography. The impact of finance on regions and global inequalities is critical, which the book investigates from a financial geographer's perspective.

What makes the book unique compared to others is its visualisations and maps, which make it easy to track and understand the topics. By analysing millions of data points and hundreds of interviews, the first book-length collection of maps and graphics dedicated to demystifying the world of finance was created. According to the writer, over twelve thousand hours of work were put into finalizing the project. To connect the dots and understand the topics of finance, ancient coins, maps, and interesting graphics were utilized. For instance, a visualisation reveals football clubs' financial strategies located in Europe using a line graph with their net balance on loans and sales, which, without this visualisation, would be difficult to compare. As the writer confess on the second page of this Atlas, "It is very hard to understand the problem we do not see, therefore we need to map and visualise it." On his visit to St Peter's School in 1998, he encountered almost twenty thousand atlases: atlases of beer, chocolate, and wine, an atlas of countries that do not exist. There were nearly atlases of everything except finance, which was the main motivation for the writer.



Starting with the history of finance, Wójcik goes through several phenomena explaining the progression, structures, and mechanisms of finance. The foundation of finance can be traced back to the earliest cities in Mesopotamia, where the first financial terms were introduced. In the next part, we see how destructive finance can be by guiding us through chapter Bubbles and Crises over time. The world of crises is visualized with a map where crises are listed for each country with colour coding involving four centuries, starting from the 1600s where Dutch tulip bulb market bubble happened. Then the author explains how financial power should be managed, and the consequences of failing to do so are discussed in the previous chapter. Therefore, he stresses the necessity of central banks and control over finance. Then, a separate section examines the correlation between the production of science in finance and its geographical location, highlighting the potential bias against other countries due to a lack of diversity in publications. In the next part, the evolution of finance is demonstrated by explaining how wealth distribution changed over the years. Furthermore, the analysis is extended to non-traditional financial areas such as the football transfer market, where hundreds of millions of dollars are spent each year. Since players account for the club's biggest expenses and income, they are being treated and traded as financial assets. In the final section, the book demonstrates that finance generates both benefits and drawbacks with its redistributive effects, producing simultaneous positive and negative impacts on society and the environment.

The author describes finance as not abstract, but visible everywhere, such as in cities, buildings, etc. He defines finance as human-environment relationships. Finance has played a key role in advancing our society, but we cannot say that without it, it would be impossible to develop. The author gives a great example of Australia's history, having lived for 50,000 years without money. Their first encounter with money came after the arrival of Europeans. Also, the example from Midas "With the power of the money they turned everything to the gold they touch, but at the same time it

brought hunger and destruction of natural resources" (p. 9) gives a clear context of the writer's thought on finance, as if managed well, it is a great tool, but it can also be dangerous when it is out of control.

The book puts finance in a deep historical and philosophical context by tracing its roots back to the Sumerians. The Sumerians could produce more than they needed thanks to the favourable climate, fertile land, and rivers. This led to the creation of large cities with vast populations and trade links between them. The author depicted the first measurement techniques used by the Sumerians, such as quantity and accounting periods. It also made it necessary to introduce financial terms such as taxes, insurance, and loans.

The author traces the historical evolution of finance by engaging with the ideas of three influential thinkers – Adam Smith, Karl Marx, and John Maynard Keynes. The book explains that their idea of the economy is produced by both time and geographical effects of the economy, and deconstructs classical theories through the perspective of financial geography. The ideas follow a chronological order, starting with Smith (1723–1790) in Amsterdam, Marx (1818–1883) in London, and Keynes (1883–1946) also in London, primarily highlighting the main financial centres of their times. This highlights the idea that finance is not abstract but visible in cities. While Smith summarised the essence of capitalism, and Marx examined its darker aspects, Keynes saw its decline into disorder and suggested remedies, all while participating in significant events of his day.

The author calls finance highly US and male-dominated. His opinion on gaining influence in science is that it comes through publications with more citations. Furthermore, the book highlights the critical role of journal editors in publications, supervising the whole process, where they can decide whether the paper should be accepted or not. The book made a graph about the publications in finance, and out of 195 authors of the 100 most cited publications, 172 of them worked in the US. Another graphic shows that 85 percent of editors-in-chief in the top ten journals were US-affiliated researchers. All 19 Nobel Prize winners in the economic sciences are or were white males who got their PhD in the US and worked there at the time of the award. The author argues that the power and influence they wield might lead to biased research against developing countries and public policy. However, the book outlines the recent trend in the dynamic of publications, where China's output tripled between 2012 and 2019. Nevertheless, over half of all publications in 2019 came from North America and Western Europe combined.

The book positions financial instruments as tools for creating social and physical space, in addition to distributing wealth. It claims that using finance might even enable you to exchange people and abilities, as well as to sell items you don't own. By presenting investment as both a weapon of geopolitical strategy and a force for wealth accumulation, the author demonstrates how the globalisation of capital has intensified inequality.

The book excels in combining visual storytelling with scientific data. Candlestick charts of stock indices in advanced, emerging, and frontier markets, for instance, show the unequal recovery from the 2008 global financial crisis in "Markets at a Glance." In this section, the summary of how financial markets have performed over the years since the global financial crisis is illustrated. The authors observe that whereas advanced countries, driven by American tech companies, moved forward, frontier markets "never dug out of the hole."

In the chapter Infrastructure Monopoly, the authors illustrated the global privatisation of infrastructure assets, including power networks in the UK and Chile and airports in Auckland and Frankfurt, using a Monopoly-style board. The way public goods have become speculative assets in the global financial game is criticised in this humorous yet alarming graphic.

The book expands the analysis to non-traditional financial areas, framing the football transfer market as a system for managing and organizing players as financial assets to maximize profit. While wealthy teams like Manchester City and PSG use debt and financial engineering to win competitions, clubs like Ajax, Benfica, and Porto employ "buy low, sell high" tactics. Their financial strategies are visualized using graphics to facilitate the comparison between the football clubs.

Wójcik offers a stinging critique of offshore finance, illustrating how London has evolved into a "sunny archipelago" of riches with properties in prestigious areas like Mayfair kept under the cover of shell companies registered in tax havens. To minimize the tax, rich people use an envelope through a company in an offshore tax haven. About 40 percent of these relate to the British Virgin Islands, Guernsey, and Jersey. These companies do not just offer tax benefits, but also anonymity on the ultimate owner through "closed registers" that prevent further scrutiny.

Emphasising its spread into space, sustainability, and monitoring, the book closes with a forceful analysis of the future path of finance. The last part claims that money now controls orbits, satellites, and even alien economic frontiers, therefore transcending Earth. The book provides data on some satellites that are being used for researching the outer galaxies, while others are mainly focused on Earth. Combining satellite imagery and artificial intelligence enables companies to monitor and foresee environmental risks, which assists in their investment decision. The larger path of financial power is fitly represented by this spatial leap: dispersed, data-driven, and further distanced from conventional economic centres. The il-

lustration shows the number of satellites and geography of ownership over the years, as the US and China account for more than 80 percent of all satellites.

The writers underline that in more recent fields, including space-based surveillance, carbon markets, and the digital economy, the same factors that have historically influenced finance – global inequity, technical innovation, and state power – are now at work. Significantly, they challenge who gains from these changes and warn of the dangers of strengthening monopolistic power and economic hierarchies becoming more entrenched.

The conclusion challenges academics, people, and legislators to question the paths of financial globalisation and to examine financial power through the prism of geography, justice, and government, thereby promoting critical engagement rather than a utopic vision. This emphasises the book's key message as financial power is unevenly divided and remains to be redistributed among territories, cities, and people in the same way. The book visualizes this process through the maps and graphics provided in the atlas, which makes the reader understand finance as something not only abstract and technical, but also as a geographically patterned social and environmental process.

Methodologically, *Atlas of Finance* combines innovative cartography and network analysis with secondary data taken from international financial institutions (IMF, BIS, World Bank). The writers are open about their sources and methods of analysis, frequently pointing out data gaps, especially with relation to offshore funds and unofficial economies. Although it does not specifically provide fresh statistical datasets, the book offers methodological synthesis and interpretation, transforming scattered financial data into coherent visual narratives.

Still, the book has certain limits. Though the writers try to address this in parts on development and inequality, the focus on Global North-centric institutions sometimes hides viewpoints from the Global South. Furthermore, even if the visuals are striking, without supporting scholarly explanation, they can occasionally overpower the central points or lack interpretive depth. Additionally, they often make complex financial situations seem simpler, which can obscure important details or methodological uncertainties. In some cases, the aesthetic clarity of the visuals may overshadow more in-depth analytical questions that the data would otherwise raise. Readers seeking in-depth case studies or anthropological complexity may find the broad brushstrokes limited to be challenging. Finally, certain economic data precedes significant recent changes – such as geopolitical realignments post-COVID and the evolving financial consequences of the war in Ukraine – even if it was published in 2024.

The intended audience includes graduate students and policy experts, as well as academics in finance, geography, international development, and political science. Though it relies on basic knowledge of economic and financial principles, the accessible language and visual aids make it comprehensible even to non-specialists.

Still, *Atlas of Finance* is an unusual and worthwhile addition to modern research despite these negatives. It pushes limits by asking that money be understood as a lived, uneven geography rather than as a neutral system.

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