FOLIA GEOGRAPHICA

FOLIA GEOGRAPHICA

Volume 66, 2024, No. 1

Executive editor:

doc. RNDr. Kvetoslava Matlovičová, PhD.
University of Economics, Bratislava, Slovakia
University of Prešov, Slovakia

Editor-in-Chief:

prof. RNDr. René Matlovič, PhD.
Slovak Academy of Sciences,
Institute of Geography, Bratislava, Slovakia

CONTENT

POLYCRISIS IN THE ANTHROPOCENE AS A KEY RESEARCH AGENDA FOR GEOGRAPHY: ONTOLOGICAL DELINEATION AND THE SHIFT TO A POSTDISCIPLINARY APPROACH

René MATLOVIČ [A], Kvetoslava MATLOVIČOVÁ [B*]

A   Institute of Geography, Slovak Academy of Sciences, Štefánikova 49, 814 73 Bratislava, Slovakia
    https://orcid.org/0000-0002-8935-6462, *geogmatl@savba.sk*

B*   Department of Tourism, University of Economics, Dolnozemská cesta 1, 852 35 Bratislava, Slovakia
    https://orcid.org/0000-0001-9635-4177, *kvetoslava.matlovicova@euba.sk* (corresponding author)

Abstract

The Anthropocene is a proposed geological epoch that marks the significant impact of human activities on the Earth's ecosystems (Lewis, Maslin 2015). Humanity currently faces many interwoven challenges and traps arising from intricate interactions between humans and their environment. These challenges and traps, known as polycrisis in the Anthropocene, represent one of the greatest challenges for research across various scientific disciplines. This paper explores polycrisis in the Anthropocene as a critical research agenda for geography, discussing its conceptualization, importance, and possibilities for study from a geographical perspective. The concept of polycrisis has not been adequately addressed in the geographical literature. Geography offers a rich heritage through its various subdisciplines. This paper will discuss how these subdisciplines and other related disciplines could be integrated into the geographical study of polycrisis. This discussion will consider the ontological delineation of polycrisis within the context of geographical research. The main idea of this paper is that an ontologically highly complex and hybrid object of research such as polycrisis provides an opportunity for a shift from the subdisciplinary fragmentation of geography to the application of a postdisciplinary perspective. The main research motivation is to strengthen the social relevance of geography in the context of the quest for global sustainability.

Key words

Anthropocene, geography, geographic thought, global sustainability, multidisciplinarity, multiciris, polycrisis, postdisciplinarity, subdisciplinary fragmentation, transdisciplinarity.

INTRODUCTION

There have been repeated calls in the geography literature to respond to the loosening of geography and to counteract the fragmentation into subdisciplines and multiple paradigms by advancing various proposals to rebuild, integrate, and reunify it (e.g., Hart 1982, Häufler 1982, Liszewski 2016, Liu et al. 2022, Wilczyński 2003). Several Slovak geographers have also contributed to these discussions (Drdoš 2004, 2006, Drdoš, Oťaheľ 2006, Ira, Matlovič 2020, Matlovič 2006, 2007, 2009, Matlovič, Matlovičová 2020, Oťaheľ et. al. 2019, Žigrai 2013). In seeking a unifying platform for geography, it is feasible to adopt an ontological, epistemological, or problem-based perspective (Matlovič 2006). In these proposals we often encounter an emphasis on the social relevance of geography. The idea is that geography as a scientific discipline should contribute to solving problems and issues that plague society in a given spatio-temporal context (Matlovič, Matlovičová 2012). The Anthropocene as a contemporary geological era has been conceptualized in the scientific literature precisely on the basis that it is characterized by a significant impact of human activities on the Earth's ecosystems (Lewis, Maslin 2015). We face many challenges and dilemmas that are linked to the complexity and complexity of the interconnections between human society and the natural environment. These are unprecedented challenges that are environmental, social, economic, health, geopolitical, political and technological in nature. Collectively, they are called polycrises and are a major challenge for research from the perspective of many scientific disciplines. The main goal and primary research motivation in this effort are to maintain global sustainability. The conceptualization of polycrisis is absent in the geographic literature. Geography, however, has a solid potential of its various sub-disciplines to grasp this issue. In our paper, we focus on highlighting the possibilities of integrating subdisciplinary perspectives into a holistic study of polycrisis from a geographical perspective.

THE CURRENT STATE OF KNOWLEDGE ON THE ISSUE

There are only a few attempts to address the term „polycrisis" and its widespread effects on the global economy in the economic-geographical research (Barnes, 2023; Dixon et al., 2023; Kogler et al., 2023; Leyshon, 2023; Yeung, 2023). For instance, Gong et al. (2022) highlight that polycrisis has prompted an increased focus on reshoring and regionalizing production, offering an alternative to reliance on fragile and disrupted global production networks. The rural dimensions of the polycrisis, particularly focusing on how geographical patterns of inequality are affected, are examined by M. Woods (2023). In 2024, research into climate change's impact on mental health and welfare will become increasingly necessary (G. Martin 2024). His argument is that health geography can contribute to the understanding of this relationship through the analysis of spatial processes and interactions.

So far, the richer results in the study of polycrisis have come from researchers in disciplines that collaborate with geography. An example is the study by Coetzer et al. (2023) written from a geopolitical and geoeconomic perspective. The world is experiencing a series of interconnected and overlapping crises, which are referred to as polycrisis or permacrises. These crises are represented by economic hardship, political instability and social upheaval, exacerbated by ongoing conflicts and climate change. These authors pay attention to several conflicts such as the Russian-Ukrainian war, the war between Hamas and Israel, and other regional conflicts and civil wars (Afghanistan, Myanmar, Sudan, Syria) and also discuss their impact on global political and economic systems (Coetzer et al., 2023). A second example is a study from the perspective of international relations by Davies and Hobson (2023). Framing the pandemic as both a social disaster and a component of an ongoing polycrisis, this work contends that existing responses to COVID-19, despite their insights, are inherently partial and constrained. These responses are based on assumptions about our understanding of the world that have now been revealed to be problematic. This situation necessitates not merely incremental changes but rather a period of rigorous disciplinary reflection on the boundaries and foundations of our knowledge (Davies and Hobson, 2023). A third example is an article by Dinan et al. (2024) written from a crisis management perspective. Dinan et al. (2024) suggest that the term of polycrisis, while useful for understanding global interconnected crises, may not be entirely applicable at the national level. The study proposes viewing polycrises as bundles of "normal" crises, which can be managed using existing crisis management frameworks. A fourth example is an article by Nolan (2023), in which the author explores the impact of the global cost-of-living crisis on human rights. He has focused on research on the genesis of the cost-of-living crisis, highlighting in particular the impact of the COVID-19 pandemic and the Russian-Ukrainian war. According to him, these events caused supply chains to be disrupted, associated with rising inflation and prices of basic goods, especially food and energy. This has led to widespread economic problems. Real incomes were reduced, and food and energy insecurity increased, threatening the rights to adequate food, housing, and health. While Nolan interprets the cost of living crisis as a difficult challenge, he also points out that it is an opportunity to strengthen human rights frameworks and ensure their effectiveness in protecting human dignity during economic crises (Nolan 2023).

However, there is a lack of comprehensive works in the geographical literature that discuss the ontological, epistemological, and methodological issues of geographical research of polycrisis.

OBJECTIVES

The main aim of this article is to partially address this gap in the geographical literature by focusing on the ontological issues related to the geographical research of polycrisis. The geographical perspective boasts a rich legacy through various subdisciplines and traditions of geographic thought (Matlovič and Matlovičová 2015, 2020). This paper aims to explore how these subdisciplines and related disciplines can be integrated into the geographical study of polycrisis. It attempts to contribute to discussions on the future development of geography by addressing the discipline's fragmentation and moving towards a postdisciplinary approach.

DATA AND METHODS

In this study, we used a focused content and discourse analysis applied to selected scholarly publications that discuss the concept of polycrisis or the shift of scientific research towards post-disciplinarity. The selection of publications was made through international bibliographic databases using relevant keywords. The selected publications discussed are listed in the reference list. In the analysis, we focused on arguments related to the definition and delineation of the basic characteristics of polycrisis as well as arguments related to advocating or criticizing the shift of scientific research towards a postdisciplinary approach. We then analyzed the differences in the understanding of polycrisis by different disciplines and formulated a definition of polycrisis from a geographical perspective. We also conducted a comparative analysis of approaches in scientific research in the context of a range of attitudes towards disciplinarity.

CONCEPT OF POLYCRISIS AT A GLANCE

More recently, the American economic historian Adam Tooze (2022) has been instrumental in popularizing the concept of polycrisis. He believes the prefix "poly" has the potential to highlight a variety of challenges without pinpointing a single dominant contradiction or source of tension or dysfunction. However, the term has previously appeared in a speech by the Jean-Claude Juncker, in Athens in June 2016, in which he addressed the challenges facing the European Union. Juncker referred to *"the confluence of multiple, mutually reinforcing challenges... from the worst economic, financial and social crisis since the Second World War, to security threats in our neighbourhood and at home, to the refugee crisis, to the referendum in the United Kingdom, all of which are mutually reinforcing and create a sense of doubt and uncertainty in the minds of our people"* (Juncker 2016).

However, the concept of polycrisis was first conceptualised at the end of the last millennium. The term „polycrisis" was introduced into scientific discourse in a monograph by Edgar Morin and Anne B. Kern (1999). These authors applied it to situations in which the crises affecting humanity are intertwined and overlapping. According to them, the fundamental problem of life on our planet is not any single

threat but the complex interconnection of problems, antagonisms, crises, and uncontrollable processes on our planet (Morin, Kern 1999, p. 74). This concept was later adopted by other authors. Mark Swilling (2013) can be cited as an example. This author understands polycrisis as „a set of globally interacting socio-economic, ecological and cultural-institutional crises and whose roots cannot be reduced to a single cause" (Swilling 2013, p. 98). In his later work, he specified that these are multiple interrelated crises, among which he included climate change, the growth of inequality and the financial crisis (Swilling 2019).

The linking of polycrisis and Anthropocene issues is encountered in a study by P. Søgaard Jørgensen et al. (2023). These authors adapted the classical concept of evolutionary traps to humans and the broader concept of the Anthropocene. Subsequently, they analyzed the interactions, course and severity of these Anthropocene traps. They define Anthropocene evolutionary traps as „phenomena manifested on the global scale of human society, i.e., with dynamics occurring on at least several continents, which cause the maladaptive nature of one or more human practices. This maladaptation manifests itself in negative impacts on human well-being that can be incremental to catastrophic in nature". They identify 14 traps and classify them into three categories: global traps, technology traps, and structural traps. (Søgaard Jørgensen et al. 2023, p. 3).

Lawrence et al. (2024) address a research agenda aimed at studying the causal mechanisms that interconnect multiple global systems and appear to generate near-simultaneous global crises. They define global polycrisis as „the causal entanglement of crises in multiple global systems in ways that significantly degrade humanity's prospects" (Lawrence et al. 2024, p. 4). Lawrence et al. (2024) outline potential avenues for research in the field of polycrisis analysis through the application of critical transitions theory, advocating for a systems-based framework to conceptualize global crises. The authors describe these crises as manifestations of systemic disequilibrium, which precipitate considerable adverse impacts on human well-being. They further categorize these impacts into two types: those resulting from the standard operations of a system, and those emerging from abrupt disturbances in the system's regular functions, identified as systemic crises. Lawrence et al. (2024) differentiate between prolonged stresses and rapid trigger events that synergistically interact to destabilize a system's equilibrium, thereby precipitating a crisis. Stresses are identified as gradual processes, including increasing socio-economic disparities, global warming, and demographic shifts, which over extended periods (years to decades) incrementally undermine the stability of a system's equilibrium. Conversely, triggers are characterized as swift occurrences, such as political upheavals, financial collapses, or the extinction of pivotal species, which in conjunction with existing stresses, disrupt the system's balance within a very short time frame (seconds to weeks). These trigger events are pivotal in activating latent risks, leading to cascading failures within the

system. According to Lawrence et al. (2024), this distinction between stresses and triggers recognizes the multiple temporalities, scales, and causes of global crises.

A more detailed definition of the crises, or the risks contributing to the emergence of a polycrisis, has been presented by the World Economic Forum (WEF) in its report, which anticipates the growing risk of polycrisis (WEF, 2023, p. 9). The WEF sees the interaction of individual risks with the amplifying effect of their impacts as an important feature. The consequence is that the total impact of a polycrisis will be greater than the sum of the impacts of the individual individual crises (WEF 2023, p. 57). In this report, the individual risks are categorized into groups: environmental (e.g., natural resource crisis, inability to mitigate and cope with the impacts of climate change, loss of diversity and ecosystem collapse, environmental disasters and accidents), economic (e.g., collapse of supply chains important to the global economic system, proliferation of illegal economic activities, debt crisis, bursting of the asset bubble), geopolitical (e.g., ineffectiveness of multilateral international institutions, geo-economic confrontation, inter-state conflicts, international terrorism, use of weapons of mass destruction, collapsing states), social (e.g., erosion of social cohesion, large-scale forced migrations, collapse or lack of public infrastructure and services, cost-of-living crisis, spread of hoaxes and misinformation, chronic diseases, severe deterioration of mental health), and technological risks (e.g., disruption of critical information infrastructure, negative effects of emerging technologies, cybercrime, digital inequality, concentration of digital power). (WEF 2023, p. 30).

Other theoretical issues arise in relation to the conceptualization of polycrisis. These include the criterion of the minimum number of individual crises, the confluence of which is supposed to create a polycrisis. Another problem is the scaling of the polycrisis, which has most often been associated with the global level. A third problem is the definition of the typical characteristics of a polycrisis. In this context, the reflections of the authors of the Cascade Institute discussion paper are relevant.

Scott Janzwood and Thomas Homer-Dixon (2022) utilize a conceptual framework that distinguishes between systemic risk, global catastrophic risk, polycrisis, and global polycrisis according to their origin, scope, and severity. By systemic risks, they mean *"potential threats that threaten the functionality of systems of critical importance to society and whose impacts may extend beyond the system of origin and affect other systems and functions"* (Janzwood, Homer-Dixon 2022, p. 3). Thus, systemic risk is generally understood to originate within one system (the system of origin) and then cascade beyond its boundaries to other systems (spillover systems) (Janzwood, Homer-Dixon 2022, p. 4.). To define a global polycrisis, these authors used the criterion of *"any combination of three or more interconnected systemic risks with the potential to cause cascading failure of our planet's natural and social systems"* (Janzwood, Homer-Dixon 2022, p. 5.).

Another issue discussed by Janzwood and Homer-Dixon (2022, p. 6) is the scaling of polycrisis. Their considerations suggest the possibility of different scaling along a global-local continuum. A global crisis produces effects at the planetary scale, while polycrises of lower scales are manifested in different geographically defined areas (Janzwood, Homer-Dixon 2022, p. 6).

These authors have also touched upon the problem of the properties of polycrises. In their perspective, a global polycrisis will inherit the following characteristics of systemic risks —extreme complexity, high nonlinearity, cross-border causality, and deep uncertainty—while also displaying causal synchronicity between risks. A global polycrisis will irreversibly and catastrophically worsen humanity's future prospects (Janzwood, Homer-Dixon 2022, p. 6.) At this point, therefore, it should be stressed that polycrisis involves the interaction of complex global systems with properties such as nonlinearity and boundary permeability. These inherent characteristics of polycrisis obfuscate the delineation of cause-and-effect relationships, thus rendering policy decisions more complex due to the deeply interwoven nature of crises. (Lawrence et al. 2024).

Table 1: A review of conceptualisations of polycrisis and related terms

TERM	DEFINITION	SOURCE
Polycrisis	„ … no single vital problem, but **many vital problems**, and it is this **complex intersolidarity of problems**, antagonisms, crises, uncontrolled processes, and the general crisis of the planet that constitutes the number one vital problem"	Morin, Kern, (1999, p. 74)
Polycrisis	„ … a set of **globally interacting** socio-economic, ecological and cultural-institutional crises and **whose roots cannot be reduced to a single cause**"	Swilling, (2013, p. 98)
Polycrisis	" … the **confluence of multiple, mutually reinforcing challenges**… from the worst economic, financial and social crisis since the Second World War, to security threats in our neighbourhood and at home, to the refugee crisis, to the referendum in the United Kingdom, all of which are mutually reinforcing and **create a sense of doubt and uncertainty in the minds of our people**"	Juncker, (2016)
Polycrisis	„ … the shocks are disparate, but they interact so that the whole is even more overwhelming than the sum of its parts'"	Tooze, (2022)
Global Polycrisis	„ … **the causal entanglement of crises in multiple global systems** in ways that significantly degrade humanity's prospects"	Lawrence et al. (2024, p. 4)
Polycrisis	„ … is a 'state' in which **multiple, macroregional, ecologically-embedded, and inexorably interconnected systems face high** – and advancing – **risk** across socioeconomic, political, and other dimensions"	Mark et al., (2023, p. 10)

Polycrisis	„ … as any **combination of three or more crises**, which may not be confined to a particular geographical region or geopolitical setting"	Janzwood, Homer-Dixon (2022, p. 4.)
Polycrisis	„ … a **cluster of distinct crises that interact** in ways that they and/or their effects tend to reinforce each other"	Helleiner (2024, p. 1)
Polycrisis	„ … needs to be **understood as a crisis of social reproduction** that takes on a political form"	Jayasuriya (2023, p. 1)
Polycrisis	„ … serves **as a heuristic and analytical tool to understand and discuss our current era's existential problems**, ranging from climate change to geopolitical instability	Lähde, (2023)
Polycrisis	… is a multi-systemic crisis resulting from the interaction of multiple systemic risks that combine in a network, known as a risk nexus. These interacting risks produce **interrelated and synchronized systemic crises, creating cascading effects** throughout society	Walsh, (2023)

In the context of this discussion, Dmitry Orlov's earlier work (2013) is particularly relevant. He outlines a comprehensive framework for understanding the sequential stages through which societies experience collapse. Orlov identifies five stages: financial, commercial, political, social, and cultural collapse. Each stage represents a deeper level of systemic breakdown, starting with the failure of financial systems and progressing through the collapse of trade and governance structures, leading ultimately to the disintegration of social norms and cultural coherence. Orlov provides insights into the mechanisms and triggers of collapse, drawing on historical examples to illustrate the progression and interdependence of these stages. He claims that if the first three stages are addressed with appropriate responses, it may be possible to prevent further breakdown and avoid the extremes of social and cultural collapse (Orlov, 2013).

Critical perspectives on the concept of polycrisis also appear in the literature, summarized by Bo Harvey (2023). He cites Noah Smith's reservations, pointing out that crises are not necessarily related and the possible biases arising from the availability heuristic. Another critic is Guney Isikara, who sees language behind the concept designed to obscure the relationship of crises to capitalist social relations (Harvey 2023). A similar critical perspective is presented by Farwa Sial (2023). She interprets it as a neologism adopted by the conventional Western media and especially Bretton Woods financial and political institutions. She finds the concept of polycrisis both too all-encompassing and too abstract. Yet crises are not merely externalities of the capitalist system but are an integral part of its functioning, and their confluence over time is a political outcome. She sees the cause of the crisis in the transformative role of financial and digital capitalism and in the imminent extinction of humanity due to climate change. However, these are not anomalies

of capitalism but part of its design, the consequences and spillovers of which are unevenly distributed around the world. For these reasons, Sial argues that unless the concept of polycrisis "*seriously questions the drivers of power and finds ways to challenge them, it risks becoming the next buzzword of neoliberal politics*" (Sial 2023). The perspective that a polycrisis is a political crisis stemming from the contradiction between social reproduction and the crisis of capital accumulation also aligns with this context. (Jayasuriya 2023, p. 1).

Some authors contest the originality or distinctiveness of the current circumstances, which the term "polycrisis" suggests. Kluth (2023) contends that there is nothing fundamentally novel about our current situation and proposes that, rather than adopting new terminology, efforts should be redirected towards addressing individual crises in isolation. For a critical reflection on the concept of polycrisis, the position on the notion of crisis is also relevant. J. Roitman (2013) challenges the dominance of crisis narratives in contemporary thought and policy. She argues that labeling situations as crises often oversimplifies complex conditions and can obscure more nuanced understandings. Roitman calls for alternatives to crisis thinking, encouraging a shift towards understanding ongoing processes and conditions without defaulting to the crisis framework (Roitman 2013).

Summarizing the above, it is obvious that the concept of polycrisis is primarily anchored in complexity theory and the study of the nonlinear dynamics of complex systems. On the other hand, its critique is situated in the discourse of Marxist-oriented critical social theorists and postcolonial discourse.

CONCEPTUALISATION OF POLYCRISIS IN THE CONTEXT OF GEOGRAPHICAL RESEARCH

Based on this review of contemporary knowledge and findings, we can proceed with our conceptualization of polycrisis. For the purposes of our research, we identify the main properties and features of polycrisis, which are crucial for its definition in the context of geographical understanding: multidimensionality, complexity, cascadability, and scale adaptability (see Table 2).

The multidimensionality of polycrisis, in our understanding, is the occurrence of multiple crises that can include phenomena and processes of environmental, economic, political, geopolitical, social, health, and technological nature. This feature implies the need for multidisciplinary and multiparadigmatic approaches to the study of polycrisis. The complexity of polycrisis refers to the occurrence of interconnected crises whose effects interact and reinforce each other. Cascadability of polycrisis (causal synchronicity in terms by Janzwood and Homer-Dixon, 2022) means that crises occur in a chain reaction, where each event triggers the next. If crises occur simultaneously, in parallel, or sequentially, it may not be sufficient to consider them as a polycrisis because, although crises occur at the same time, they

may be independent or unrelated. In these cases, it might be more appropriate to think in terms of a multi-crisis. The basic condition for delineating polycrisis in this context is the interconnectedness of crises. Scale adaptability means that crises manifest differently at various scales along a global-local continuum (global, continental, macroregional, national, mesoregional, local). This involves recognizing the interconnectedness of global and local scales and understanding how local events influence and are influenced by global dynamics.

Polycrisis, as we understand it, refers to the cascading occurrence of multiple interconnected crises. These crises can involve environmental, economic, political, geopolitical, social, health, and technological phenomena and processes (dimensions). Their effects interact and reinforce each other, manifesting differently at various scales along a global-local continuum. These crises can lead to persistent, widespread challenges affecting multiple aspects of society. A global polycrisis has potential to cause catastrophic consequences for society, possibly leading to the irreversible degradation of human civilization and the collapse of global sustainability. A geographical perspective emphasizes the spatial dimensions and locational contexts that shape and are shaped by these crises, recognizing that different regions and places experience and respond to these overlapping emergencies in diverse ways.

Table 2: Properties and features of polycrisis

Property	Key feature	Description
– Multidimensionality	– Multiple crises	– At least three, could have environmental, economic, political, geopolitical, social, health, or technological nature
– Complexity	– Interconected crises	– Their effects interact and reinforce each other
– Cascadability	– Cascaded occurence of crises in time	– Crises occur in a chain reaction, where each event triggers the next
– Scale Adaptability	– Various faces of crises along a global-local continuum	– Manifesting differently at various scales (global, continental, macroregional, national, mesoregional, local), and responding in diverse ways

Source: own elaboration

ONTOLOGICAL DELINEATION OF POLYCRISIS IN THE CONTEXT OF GEOGRAPHICAL RESEARCH

Polycrisis is an extremely complex and hybrid phenomenon. This key feature of polycrisis fully corresponds to the hybrid nature of the object of study of geography, which is the Earth Landscape Sphere. It can be interpreted based on inspiration from the work of the German geographer M. Büttner (1985), who dealt with the geographical study of religions. He developed the Bochum model of the interaction between religions and the geographical environment. According to this model, interactions between the structures that relate to the three levels take place. If we adapt his idea to the problem of the object of geography, we could identify these structural levels with a different degrees of evolutionary complexity in terms of Hampl´s theory (Hampl 2000). The first and highest is the noospheric and cyberspheric level, comprising immaterial entities of anthropogenic origin (the sphere of thought, ideas, perceptions, values, ethical principles, immaterial culture, religious and ideological doctrines, virtual cyberspace, and artificial intelligence). The middle is the sociospheric level, which is made up of the population, consisting of individuals and various groups (defined based on biological, social, economic, political, and cultural traits or interests) and their corresponding institutional structures. The sociospheric level develops activities that can be called socio-economic, political, and cultural life. The manifestation of sociospheric level activities may be regular (daily, weekly) or episodic in time. In terms of the spatial scope of action, a distinction is made between local, regional, and global impact. The third and lowest is the landscape level, containing all material objects and phenomena of the natural and technospheric environment (permanent facilities serving the activities of the sociosphere). Horizontal interactions take place at each level. Vertical interactions occur between adjacent levels, while significant diagonal interactions occur between all levels. The forces reshaping the landscape do not come directly from the noospheric and cyberspheric levels, but every interaction between them and the landscape level operates through the sociospheric level. Geography, in its investigation, initially paid much attention to horizontal interactions at the third level. Gradually, especially in connection with the development of social geography, it began to pay attention to horizontal interactions at the second level and vertical interactions between the third and second levels. More recently, especially in connection with the development of humanistic and transhuman (more than human) geography, the first level, vertical interactions between the first and second levels, and diagonal interactions, especially the effects of the cybersphere on changes in the geographical organization of the country, have come into its field of vision. It is only in a comprehensive investigation of the entire complexity of the interplay between the three structural levels of the object thus understood that the fulfilment of the research ambitions of geography can be sought. It is in the study of

the vertical and diagonal interactions between these three structural levels that geography, as a discipline, is indispensable in the field of research (Matlovič 2006).

A polycrisis is characterized by the presence of specific crises (dimensions) and their interactions. The specific crises involved in a polycrisis can vary widely depending on the context but generally include a combination of environmental, economic, social, health, technological, political and geopolitical challenges. In the following table (Table 3), we link the nature of crises (dimensions of polycrisis) with structural levels of the Bochum model, which are affected by specific polycrises and with interactions at the levels and between levels.

Table 3: Dimensions of polycrisis in the context of structural levels and interactions of Bochum model and subdisciplinary division of geography

NATURE OF CRISIS	KEY CHALLENGES AND RISKS	STRUCTURAL LEVELS	INTERACTIONS	DOMAIN OF SUB-DISCIPLINES
Environmental	– climate change, loss of biodiversity, water scarcity, natural resource crisis, ecosystem collapse, environmental disasters, and accidents	– Landscape – Sociospheric – Noospheric	– Horizontal – Vertical – Diagonal	– Physical geography, – Environmental geography, – Behavioral geography
Economic	– collapse of the global supply chains, proliferation of illegal economic activities, debt crisis, bursting of the asset bubble, financial market instability, and economic inequality	– Landscape – Sociospheric – Noospheric	– Horizontal – Vertical	– Economic geography, – Geoeconomics
Social	– tension between social repro-duction and accumulation, commodification of social reproduction, social inequalities, demographic shifts, urban de-cay, erosion of social cohesion, large-scale forced migrations, collapse or lack of public infra-structure and services, cost-of-living crisis, growing importance of precarious labour, spread of hoaxes and misinformation,	– Landscape – Sociospheric – Noospheric	– Horizontal – Vertical	– Social geography, – Economic geography, – Demography, – Urban geography, – Rural geography,
Political	– Political instability, governance failures, corruption, and the ero-sion of democratic institutions	– Landscape – Sociospheric – Noospheric	– Horizontal – Vertical	– Political geography,
Health	– Pandemics like COVID-19 or widespread health issues linked to pollution or lifestyle diseases, mental health problems	– Sociospheric – Noospheric	– Horizontal – Vertical	– Medical geography, – Behavioral geography,

Techno-logical	– Cybersecurity threats, the disruption caused by automation, and the digital divide, disruption of critical information infrastructure, negative effects of emerging technologies, cybercrime, digital inequality, concentration of digital power	– Sociospheric – Noospheric Cyberspheric	– Horizontal – Vertical – Diagonal	– Cybergeography, GIS, – Behavioral geography, – Social geography
Geopo-litical	– International and inter-state conflicts, terrorism, and the shifting power dynamics on the global stage, ineffectiveness of multilateral international institutions, geo-economic confrontation, iinternational terrorism, weapons of mass destruction, collapsing states	– Landscape Sociospheric – Noospheric	– Horizontal – Vertical – Diagonal	– Cultural geography, – Historical geography, – Geopolitics, – Political geography, – Military geography, Economic geography

Source: own elaboration based on WEF (2023) and Büttner (1985)

The Earth Landscape Sphere encompasses five groups of qualitatively distinct interacting geospheres, each reflecting a degree of evolutionary complexity. These include: material geospheres of inorganic character (lithosphere with georelief, atmosphere, hydrosphere); material geospheres of inorganic-organic character (pedosphere); material geospheres of organic character (biosphere); material geospheres of anthropogenic character (social-economic sphere - sociosphere and technosphere); non-material geospheres of anthropogenic character (noosphere and cybersphere). The noosphere is interpreted either as a psychosocial sphere, representing the highest stage of evolution, or as a segment of the biosphere transformed by human culture and thought. Additionally, cyberspace, virtual reality, and artificial intelligence are considered part of the Earth's landscape sphere, reflecting the trend towards the dematerialization of the economy and societal life (Matlovič, 2006, p. 19).

The first three groups of geospheres are primarily the domain of physical geography and its related subdisciplines such as Environmental Geography, Landscape Ecology, Quaternary Geology, Geomorphology, Climatology, Hydrology, Oceanology, Soil Geography, Biogeography, Geographical Information Science, Remote Sensing, Cartography, and others. The fourth and fifth groups fall under the domain of social sciences, technological disciplines, humanities, cognitive sciences, and philosophy, including Human Geography and its associated subdisciplines like Social Geography, Population Geography and Demography, Urban Geography, Rural Geography, Spatial Planning, Economic Geography, Agricultural Geography, Industrial Geography, Geography of Transport and Services, Geography of Tourism,

Political Geography, Geopolitics, Cultural Geography, Behavioural Geography, Regional Geography, Historical Geography, Medical Geography, Cybergeography, Geographical Information Science, Applied Geography, Metageography, and Geographic Thought (Matlovič 2006, p. 19).

Polycrisis, therefore, presents itself as a research agenda where the subdisciplinary fragmentation of geography must be bridged. Traditionally, subdisciplines establish boundaries of knowledge, dictating methodologies, subject matter, and scholarly discourse. The evolution of complex global polycrisis necessitates the development of frameworks that transcend these traditional boundaries. This need is also evident from the statement of E. Morin, who first introduced the term 'polycrisis' into scientific discourse: "*our compartmentalized, piecemeal, disjointed learning is deeply, drastically inadequate to grasp realities and problems which are ever more global, transnational, multidimensional, transversal, polydisciplinary, and planetary*" (Morin 2001, p. 29). While a multidisciplinary approach appears to be sufficient for the study of multi-crisis, the definition of polycrisis implies the necessity to move towards a postdisciplinary approach to knowledge production.

ADVOCATING AND CRITICISM OF THE POSTDISCIPLINARY APPROACH

In the evolution of scientific knowledge, integrative tendencies are emerging alongside continued differentiation and specialization. These integrative efforts signify profound qualitative changes in the structure of science and scientific knowledge (Bodnár, 2005, pp. 55-56). J. Bodnár (2005, p. 56) identifies three potential forms of synthesis proposed by B.M. Kedrov: cementation, fundamentation, and pivotation. In the progression of geographical thought, we have observed integrative efforts primarily characterized by fundamentation—adapting methodologies from other sciences such as physics to geography—and pivotation, exemplified by the incorporation of more abstract sciences, such as mathematics and cybernetics, into geography. Recently, metageographical discussions have trended towards cementation, aiming to build bridges between previously separated disciplines (Matlovič 2009). The shift to a postdisciplinary approach is in the context of this discussion is a specific case of cementation.

In the scientific literature we can encounter several works in which the postdisciplinary approach is promoted and advocated. One of the prominent authors is E. Morin, who introduced the concept of polycrisis into scientific discourse. Morin (1992) offers a new perspective on scientific inquiry that appears to be inspiring for postdisciplinary thinking. He explores the need for a new paradigm of complexity to inform all theories across various fields. He critiques General System Theory and holism, proposing a reformation in the organization of knowledge through recursive thinking, which establishes dynamic feedback loops between complementary and antagonistic concepts. Morin suggests moving

from a theory of systems to a system paradigm that can be applied universally. This paradigm should recognize the complexity and dynamic interactions within systems rather than simplifying them to mere wholes or parts. Morin highlights the importance of interactions and organization within systems. He posits that understanding these interactions requires drawing on various fields of study, from the natural sciences to the social sciences and humanities. Morin critiques the fragmentation and reductionism prevalent in traditional disciplinary boundaries. He argues for a paradigm that integrates knowledge across disciplines, recognizing that complex phenomena cannot be fully understood within the confines of a single discipline. This integration is essential for addressing the multifaceted nature of real-world problems. This inherently supports a postdisciplinary approach where boundaries between disciplines are blurred to facilitate a more comprehensive understanding. By emphasizing the complexity of systems and the necessity to consider both the parts and the whole, Morin argues against the simplification inherent in traditional disciplines. This perspective necessitates a broader, more inclusive sapproach to knowledge that transcends disciplinary boundaries. In summary, Morin's arguments for a paradigm of complexity, recursive thinking, integration of knowledge, and epistemological reformation strongly implicitly advocate for a postdisciplinary approach. This approach is necessary to address the inherent complexity of modern scientific, social, and environmental challenges effectively (Morin 1992).

An important author who already explicitly advocates a postdisciplinary approach is the representative of critical realism A. Sayer (2000). He argues that traditional academic disciplines are inherently parochial, focusing narrowly on their own specific questions and methodologies, which stifles innovation and broader understanding. Disciplines also exhibit imperialism by attempting to claim territories and explain phenomena outside their core expertise, often leading to overreach and misinterpretation. Disciplinary boundaries often prevent scholars from exploring ideas and connections beyond their narrow focus, limiting the potential for comprehensive and holistic understanding of complex phenomena. Sayer advocates for breaking these boundaries to allow scholars to follow ideas and evidence wherever they lead, without being confined by disciplinary constraints. Postdisciplinary studies encourage scholars to focus on learning and knowledge rather than adhering to the limits of specific disciplines. This approach promotes a more coherent and integrated understanding of complex issues. Sayer argues that postdisciplinary studies do not lead to dilettantism or eclecticism but rather require rigorous following of connections and ideas, leading to deeper and more comprehensive insights. Sayer suggests that postdisciplinary studies are in line with the intellectual traditions of early scholars, such as Adam Smith and Karl Marx. They were pre-disciplinary, freely exploring ideas across what are now rigid disciplinary boundaries. While interdisciplinary studies bring together scholars from different

fields, they often retain their disciplinary biases and limitations. Postdisciplinary studies, on the other hand, aim to transcend these biases entirely. He calls for an "undisciplining" process to foster a more coherent understanding of the social world. This evolution is necessary to address the complex, interconnected nature of modern societal issues effectively (Sayer 2000).

Şimandan (2005) critically examines Sayer›s argument for replacing traditional disciplines with postdisciplinary studies. His arguments emphasize the importance and benefits of traditional disciplinary frameworks in the systematic production of knowledge. He argues that postdisciplinary studies lack a minimal analytical framework and do not account for the implications of post-objectivist epistemologies, making them unrealistic. According to him, systematic knowledge production inherently involves focusing on specific aspects due to the limitations of human cognition. This process, termed „cutting", is essential for creating structured, coherent knowledge. While focusing enables the generation of detailed and systematic knowledge, it also inherently produces systematic ignorance. This ignorance is not a flaw of disciplines but a fundamental aspect of human knowledge. Şimandan therefore suggests rethinking ignorance positively, as it allows for focused knowledge production. Disciplines offer invaluable research traditions and specific expertise. Their historical dimension and repository of knowledge are crucial for the continuous production and improvement of scientific understanding. Disciplines engage in continuous negotiation, importing and exporting findings, which helps them avoid parochialism and remain dynamic and innovative. Hybrid fields are seen as complementary to traditional disciplines rather than replacements. They can facilitate interdisciplinary boundary-tracing and speed up the integration of insights from different fields. (Şimandan 2005, pp. 15-28). Forman (2007) also implicitly presents several arguments against postdisciplinarity, focusing on the perceived disintegration and dissolution of disciplines in the postmodern era. While postdisciplinarity is promoted as a means to address complex societal issues, it risks marginalization within academia due to lack of clear definitions and quality standards. This can lead to rhetorical mainstreaming without substantial support or recognition

In the context of this discussion, Küpers's work (2014) provides a significant contribution. He contends that excessive specialization and departmentalization within academia result in fragmented knowledge production, which inherently limits the capacity to effectively address complex, interconnected global issues. To counter this, Küpers emphasizes the necessity of transcending disciplinary boundaries to foster a comprehensive understanding and facilitate innovative solutions. He advocates for institutional transformation that supports boundary-crossing research practices, challenging the entrenched conservatism of established academic disciplines. Küpers suggests postdisciplinarity as a potential solution, which involves a fundamental rejection of the legitimacy of

established disciplinary boundaries and a critique of monodisciplinary imperialism. This approach employs a problem-oriented methodology, starting with the identification of specific issues regardless of traditional disciplinary classifications. It then mobilizes, develops, and integrates the necessary concepts, methodologies, and knowledge to address these issues without being constrained by disciplinary boundaries. (Küpers, 2014, p.3).

The above findings show that, the postdisciplinary approach represents a paradigm shift towards knowledge production that is not confined to the pre-existing frameworks of academic discipline. The focus shifts from disciplinary knowledge to problem-solving, regardless of the conventional academic divisions. The Finnish geographer Olavi Granö (1981, p. 34) proposed to replace the division into different scientific subdisciplines with a new concept in which research would be organized around certain issues that are considered to be the most important and socially relevant. Several authors have addressed the issue of implementing a postdisciplinary approach in geographical research.

The application of the postdisciplinary approach is quite well developed in tourism research. These papers provide various perspectives on the role and implementation of postdisciplinary approaches within tourism studies, highlighting its growth and the challenges faced in such interdisciplinary engagements (Gill 2012, Darbellay 2016, (Butowski 2016, Munar et al. 2016, Pernecky et al. 2016, Wilson 2011). J. Wilson (2011) discusses the evolution of tourism geography into a postdisciplinary field, reflecting broader paradigm shifts within geography that embrace fluid, interconnected approaches to studying places and spaces. This transition supports more dynamic and flexible research methodologies that can adapt to the changing nature of global tourism and its impacts on cultures and environments (Wilson 2011).

However, the postdisciplinary paradigm is already finding reflection in other branches of geographical research. M. Goodwin (2014) argues for merging geographic analysis with political economy through a postdisciplinary lens, suggesting that such integration can provide deeper insights into economic and spatial phenomena. The blending of these disciplines can lead to more robust analyses of issues like regional development, economic disparities, and resource management (Goodwin 2014). According to Gladkey (2013), geography should embrace humanistic thinking, combining systematic research with humanistic values to develop a new postdisciplinary knowledge. N. Gregson (2003) explores the potential for a postdisciplinary future in geography, critiquing traditional disciplinary boundaries within the field. He suggested that continuing to engage in disciplinary siloing poses significant risks in a postdisciplinary world. J. Painter (2003) discusses the shift towards postdisciplinarity within political geography. I Braverman et al. (2014) are primarily focused on legal geography. They discuss the relevance of postdisciplinary approaches to understanding the interactions

between law and geographic space. A. Standish (2019) examines how decolonizing geography intersects with postdisciplinary practices, suggesting that geography itself can be viewed through a postdisciplinary lens. By embracing postdisciplinary methods, geography can better address issues of power, representation, and inclusivity, enriching both academic discourse and practical applications in diverse cultural contexts (Standish 2019). Thomas (2022, p. 49) examines research addressing key environmental challenges and concludes that there is now a fluidity between disciplines in which geography (especially physical geography) holds an important role. The environmental and societal challenges we face today necessitate collective and inclusive efforts to develop solutions that exceed the capacity of any single discipline. Sheppard (2022) argues for breaking down the barriers between human and physical geography. Sheppard highlights the artificial nature of the divide between biophysical and societal processes and advocates for a more integrated approach that considers the mutual influence of these domains. He advocates for an engaged pluralism that encourages collaboration across different philosophical, methodological, and substantive approaches within geography. This pluralism aims to foster mutual learning and innovative research that can address the multifaceted challenges of the present global conjuncture (Sheppard 2022). Liu et al. (2022) point out that addressing the complex challenges of the 21st century, such as climate change and urbanization, requires integrative approaches that transcend traditional disciplinary boundaries.

Recent geographical literature presents also different approaches that emphasize the value of internal diversity in geography, which includes human, physical, and critical physical geography. This diversity is considered beneficial for providing varied perspectives that can enhance research outcomes (Miles, 2023). H. Miles, drawing on transdisciplinarity studies and the ideas of Deleuze, introduces a productive intradisciplinary approach to the debate. She argues that effective intradisciplinary research framing is facilitated by critically engaging with geography's subdisciplinary differences. These differences should be maintained and recognized, rather than translating disparate knowledge types into a uniform format (Miles, 2023, p. 509). There is implicit distance from enthusiasmism with postdisciplinarity in this Miles´s statement.

Most of the mentioned contributions highlighted demonstrate a significant shift towards postdisciplinary approaches in geography and related fields. These approaches dismantle traditional academic barriers, promoting integration across disciplines to address complex, multifaceted problems. This movement not only enriches academic research but also improves practical applications in environmental management, urban planning, tourism development, and legal systems. The synthesis of diverse perspectives fosters a more comprehensive understanding of the world, ultimately leading to more thoughtful and effective interventions in various social, economic, and environmental issues. Additionally,

this approach is well-suited to investigating the extremely complex phenomenon of polycrisis. According to Munar et al. (2016, p. 345-6) postdisciplinarity „operates on ontological, epistemological, and methodological levels and it is also concerned with the need for knowledge creation that is more apt for societies faced with major challenges, such as climate change, economic and financial calamities, global health risks, and geopolitical crises". There is a clear call for the use of postdisciplinarity in Anthropocene polycrisis research.

In this context, it is important to point to discussions on the issue of the shift from interdisciplinarity and multidisciplinarity through transdisciplinarity to postdisciplinarity. F. Darbellay (2019a) emphasizes complexity as a primary motivator for adopting interdisciplinary approaches. Darbellay discusses the progression from multidisciplinarity, where multiple disciplines simply contribute their perspectives, to interdisciplinarity, which involves a more integrative approach, and then to transdisciplinarity, which transcends disciplinary boundaries. He introduces postdisciplinarity as a further evolution that might challenge the very notion of fixed disciplines. Darbellay provides a detailed taxonomy of terms like multidisciplinarity, interdisciplinarity, and transdisciplinarity, articulating how each contributes to a deeper understanding and solving of complex issues by transcending traditional academic boundaries. (Darbellay 2019a). Multidisciplinary research encompasses the involvement of various academic disciplines that collaboratively explore a singular theme or issue, each with distinct objectives. In this research framework, participants share knowledge from their respective fields; however, the primary goal is not to transcend disciplinary boundaries to synthesize new theories or knowledge. Instead, the research methodology advances through parallel, discipline-specific efforts. Although these efforts remain largely independent, they typically converge on the objective of comparative analysis. Each discipline retains its methodologies and assumptions while contributing to a common objective. The disciplines do not necessarily integrate or interact deeply beyond sharing data, results, or methods for specific tasks. Interdisciplinarity entails combining insights and approaches from multiple disciplines to tackle complex problems that cannot be fully understood through a single discipline. It emphasizes a collaborative approach that goes beyond merely juxtaposing disciplinary perspectives to actively creating new insights through integration. The main objective of use inter-disciplinary approach is to create a coherent and integrated understanding of complex issues by synthesizing diverse disciplinary perspectives (Darbellay 2019). Transdisciplinarity extends beyond the academic disciplines by involving stakeholders outside the academic community, such as policymakers, community members, and industry leaders, in the knowledge creation process. It seeks to transcend the boundaries of academia to include the practical, social, and ethical dimensions of issues. This approach is applied in projects and platforms that facilitate dialogue and collaboration between academic and non-academic

participants. The main objective of use the trans-disciplinary approach is to develop solutions to societal problems that are grounded in academic research but also responsive to real-world contexts and needs. Postdisciplinarity is presented as a radical evolution of thought that questions the very necessity of traditional disciplinary structures. It proposes a future where academic inquiry does not start from a disciplinary basis but is entirely oriented towards solving complex problems. Postdisciplinarity would require a fundamental reorganization of academic practices, emphasizing flexibility, creativity, and the dismantling of rigid academic structures. The main objective of use the postdisciplinary approach is to foster a more agile and responsive academic research that can innovate and adapt without the constraints imposed by traditional disciplines. While interdisciplinarity and transdisciplinarity still recognize and use the structure of disciplines (though they attempt to bridge them), postdisciplinarity challenges the relevance and utility of these boundaries altogether. Interdisciplinarity combines methodologies and theories across disciplines, transdisciplinarity integrates societal and academic knowledge creation, and postdisciplinarity seeks to eliminate the epistemological constraints imposed by disciplinarity. (Darbellay 2019a).

McGregor's article also contributes to the discussion by explaining various modes of disciplinarity, including monodisciplinary, multidisciplinary, crossdis-ciplinary, pluridisciplinary, interdisciplinary, and postdisciplinary approaches, and highlighting their limitations. According to McGregor, the postdisciplinary approach prioritizes the potential for learning and innovation by following ideas and connections wherever they may lead, rather than being constrained by the limitations of specific disciplinary frameworks (McGregor 2007, p. 489).

To this discussion contributed also other authors (Koskinen, Mäki 2016), Jahn et al.(2012), Huutoniemi (2016). Summarizing their findings, we can compare the postdisciplinary approach with other approaches with varying degrees of emphasis on maintaining disciplinary demarcations. The postdisciplinary approach appears to be the second furthest from these demarcations. The most distant is the nondisciplinary approach (Table 4).

Table 4: Comparison of the postdisciplinary approach with other approaches in scientific research according to the varying degrees of importance placed on disciplinary boundaries

Approach	Description	Methodology	Goals	Challenges
DISCIPLINARY	Focuses on a single discipline with its own set of theories, methods, and standards.	Standardized within the discipline.	Deep understanding and advancement within a specific field.	Can be limited in scope and may overlook broader context.
MULTIDISCI-PLINARY	Combines knowledge from different disciplines, but each discipline retains its methodologies and perspectives.	Juxtaposition of different disciplinary methods.	Addressing complex problems by combining different disciplinary insights.	Difficulty in integrating and balancing different perspectives.
INTERDISCI-PLINARY	Integrates knowledge and methods from different disciplines, creating new frameworks and approaches.	Integration and synthesis of methods from various disciplines.	Creating new frameworks and solutions by integrating various disciplinary perspectives.	Potential for methodological conflicts and integration challenges.
TRANSDISCI-PLINARY	Goes beyond disciplinary boundaries to create a holistic approach, often involving non-academic stakeholders.	Holistic and participatory, often incorporating methodsand perspectives from outside academia.	Solving real-world problems through comprehensive and inclusive approaches.	Complexity of managing diverse stakeholders and methodologies.
POSTDISCI-PLINARY	**Moves past traditional disciplinary boundaries to encourage innovation and creativity, often questioning existing frameworks.**	**Fluid and flexible, adapting methods as needed.**	**Encouraging innovation and breaking down traditional academic silos.**	**Lack of clear frameworks and standards, leading to potential ambiguity.**
NONDISCI-PLINARY	Rejects the concept of disciplines altogether, aiming for a completely integrated approach without predefined boundaries.	Non-standardized, highly flexible.	Achieving total integration and new forms of knowledge without disciplinary constraints.	Can be perceived as lacking rigor and structure.

Source: own elaboration based on Koskinen, Mäki (2016), Darbellay (2016, 2019a, 2019b), Jahn et al. (2012), Huutoniemi (2016).

J. Wolmark and E. Gates-Stuart explores the evolving nature of research boundaries and the emergence of postdisciplinary practices. These practices blur traditional disciplinary lines, creating cultural hybrids that challenge existing hierarchies of knowledge. Postdisciplinary research is characterized by its transgressive nature, moving beyond fixed discipline boundaries to embrace more expansive, reflexive, and collaborative approaches. Digital technologies significantly contribute to this shift, enabling innovative and dynamic research environments. The authors highlight the importance of situated knowledge, cultural hybridity, and the interplay between theory and practice in this evolving landscape (Wolmark, Gates-Stuart 2004).

The post-disciplinary approach brings certain advantages over the interdisciplinary and transdisciplinary approaches that can help in solving some scientific problems. It goes beyond transdisciplinarity by questioning or rejecting altogether any barriers arising from disciplinary boundaries. Instead of these disciplinary demarcations, it concentrates fully on the problem under investigation. This approach works well for problems in highly dynamic fields that require significant innovation and flexibility in solutions. These are made possible by not being constrained by existing theoretical frameworks and methodologies. This freedom can lead to a high level of originality and innovativeness of solutions, which is particularly appropriate in emerging fields of knowledge or when dealing with global challenges that require a rapid response. Polycrisis is a typical example of this kind of challenge. The advantage of using a post-disciplinary approach to address polycrisis, a situation in which we face multiple interrelated crises affecting global systems, is according to Darbellay (2019a) its potential to address and synthesize complexity that spans multiple domains without being constrained by traditional disciplinary demarcations.

CONCLUSIONS

In this paper, we propose a critical shift in how geographical research should approach the complex and intertwined challenges of the Anthropocene, termed polycrisis. We argue for a postdisciplinary approach to studying polycrisis, emphasizing the necessity of transcending traditional subdisciplinary boundaries in geography to address the multifaceted crises humanity faces. Polycrisis refers to the interconnected crises in environmental, economic, political, social, health, and technological domains, whose combined effects are greater than the sum of individual crises. This complexity requires a nuanced understanding that geography, with its rich subdisciplinary heritage, is well-positioned to provide.

The ontological delineation of polycrisis within geography involves understanding the interactions across different structural levels–landscape,

sociospheric, noospheric, and cyberspheric. This perspective helps in identifying how crises at different levels and scales interact, reinforcing the need for a holistic geographical approach. The study underscores the importance of integrating various geographical subdisciplines, such as physical geography, economic geography, social geography, and political geography, to create a comprehensive understanding of polycrisis. The proposed integration aligns with a postdisciplinary framework, moving beyond the traditional compartmentalized approach.

Embracing a postdisciplinary methodology, the paper advocates for flexible, problem-solving-focused research that transcends rigid academic boundaries. This approach is particularly suited for addressing the dynamic and complex nature of polycrisis, facilitating innovative and adaptive solutions. Our discussion indicates that adopting a postdisciplinary approach is promising for the future of geographical research. We emphasize its potential to provide deeper insights and more effective responses to global sustainability challenges. By doing so, geography can maintain its relevance and contribute significantly to understanding and mitigating the impacts of polycrisis in the Anthropocene.

To obtain a comprehensive understanding of polycrisis in geography, it is also necessary to consider the epistemological delineation of the issue. It can be assumed that while the ontological delineation implies a call for a shift towards postdisciplinarity, from the epistemological definition we can expect a need to move towards the postparadigmatic nature of geography. However, this discussion requires a separate article.

REFERENCES

BARNES, T. (2023). 'Mere anarchy is loosed upon the world': And what's economic geography going to do about it? *Transactions of the Institute of British Geographers*, 48, 4, 686-689. https://doi.org/10.1111/tran.12644.

BODNÁR, J. (2005). *Na hraniciach filozofie a vedy*. Bratislava: Veda, 221 p.

BRAVERMAN, I. et al. (2014). Introduction. In Braverman, I. et al. eds. *The Expanding Spaces of Law: a Timely Legal Geography*. Stanford: Stanford University Press, pp. 1-29.

BUTOWSKI, L. (2016). The Issue of Disciplinarity and Non-disciplinarity of Tourism Studies. *Téoros*, 35, 1, http://journals.openedition.org/teoros/2899

BÜTTNER, M. (1985). Zur Geschichte und Systematik der Religionsgeographie. *Geographia Religionum*, Band I., Berlin: Dietrich Reimer Verlag, pp. 13-122.

COETZER, J.H., RAJMIL, D., MORALES, L. (2023). The New Normal: Multifaceted and Multidimensional Crises and the Interplay of Geoeconomics and Geopolitics. *Peace Review: A Journal of Social Justice*, 35, 555–561. https://doi.org/10.1080/10402659.2023.2287212.

DARBELLAY, F. (2016). From Disciplinarity to Postdisciplinarity: Tourism Studies De-disciplined. *Tourism Analysis*, 21, 4, 363-372. https://doi.org/10.3727/108354216X14600320851659.

DARBELLAY, F. (2019a). From Interdisciplinarity to Postdisciplinarity: Extending Klein's Thinking into the Future of the University. *Issues in Interdisciplinary Studies*, 37, 2, 90-109. https://files.eric.ed.gov/fulltext/EJ1248672.pdf.

DARBELLAY, F. (2019b). Postdisciplinarity: Imagine the Future, Think the Unthinkable. In: Pernecky, T., ed. *Postdisciplinary Knowledge*. London : Routledge, pp. 235-250.

DAVIES, M., HOBSON, Ch. (2023). An embarrassment of changes: International Relations and the COVID-19 pandemic. *Australian Journal of International Affairs*, 77,2, 150-168. https://doi.org/10.1080/10357718.2022.2095614.

DINAN, S., BÉLAND, D., HOWLET, M. (2024). How useful is the concept of polycrisis? Lessons from the Development of the Canada Emergency Response Benefit during the COVID-19 pandemic, *Policy Design and Practice*, 1-12, https://doi.org/10.1080/25741292.2024.2316409.

DIXON, A. D., PECK, J., ALAMI, I., WHITESIDE, H. (2023). Making space for the new state capitalism, part III: Thinking conjuncturally. *Environment and Planning A: Economy and Space*, 55, 5, 1207-1217. https://doi.org/10.1177/0308518X231185587.

DRDOŠ, J. (2004). O holistickom prístupe v geografii: tradície a súčasnosť. *Folia Geographica* 7, 28-43.

DRDOŠ, J. (2006). Krajinný potenciál: integračná téma geografie? *Folia Geographica*, 45, 10, 112-121.

DRDOŠ, J., OŤAHEĽ, J. (2006). Poznámky k vývoju integračného myslenia vo fyzickej geografii na Slovensku v posledných desaťročiach. *Folia Geographica*, 45, 10, 123-139.

FORMAN, P. (2007). From the Social to the Moral to the Spiritual: the Postmodern Exaltation of the History of Science. In Renn, J., Gavroglu, K., eds. *Positioning the History of Science*, Springer, pp. 49-55.

GILL, A. M., (2012). Travelling down the road to postdisciplinarity? Reflections of a tourism geographer. Canadian Geographer, 56, 1, 3-17. https://doi.org10.1111/j.1541-0064.2011.00400.x.

GLADKEY, A.V. (2013). Humanistic paradigm of geography. *Central European Regional Policy and Human Geography*, 3, 2, 7-14.

GONG, H., HASSINK, R., FOSTER, C., HESS, M., GARRETSEN, H. (2022). Globalisation in reverse? Reconfiguring the geographies of value chains and production networks. *Cambridge Journal of Regions, Economy and Society*, 15, 2, 165-181. https://doi.org/10.1093/cjres/rsac012.

GOODWIN, M. (2004). Recovering the future: a post-disciplinary perspective on geography and political economy. In Cloke, P. et al. eds. *Envisioning Human Geographies*. London: Routledge, pp. 65-80.

GRANÖ, O., (1981). External Influence and Internal Change in the Development of Geography. In: Stoddart, D.R., ed., *Geography, Ideology and Social Concern*. Oxford: Blackwell, 17-36.

GREGSON, N. (2003). Discipline games, disciplinary games and the need for a post-disciplinary practice: responses to Nigel Thrift's 'The future of geography'. *Geoforum*, 34, 1, 5-7. https://doi.org/10.1016/S0016-7185(02)00084-2.

HAMPL, M. (2000). *Reality, Society and the Geographical/Environmental Organization: Searching for an Integrated Order*. Prague: Charles University, Faculty of Science, Department of Social Geography and Regional Development. 104 p. ISBN 80-902686-2-5.

HART, J.F. (1982). The Higest Form of the Geographer´s Art. *Annals of the Association of American Geographers*, 72, 1-29. https://doi.org/10.1111/j.1467-8306.1982.tb01380.x.

HARVEY, B. (2023). On the 'polycrisis: part 1. *Issues in Abstract Conceptual Circumference. Bo's Research*, 24 January, https://boharvey.substack.com/p/on-the-polycrisis-part-i.

HÄUFLER, V. (1982). Esej o geografii, jednotné a regionální. *Sborník Československé geografické společnosti*, 87, 1, 27-40. https://doi.org/10.37040/geografie1982087010023.

HELLEINER, E. (2024). Economic Globalization's Polycrisis. *International Studies Quarterly*, 68, 1-9. https://doi.org/10.1093/isq/sqae024.

HUUTONIEMI, K. (2016). Interdisciplinarity as Academic Accountability: Prospects for Quality Control Across Disciplinary Boundaries. *Social Epistemology*, 30, 2, 163-185. https://doi.org/10.1080/02691728.2015.1015061.

IRA, V.; MATLOVIČ, R. (2020). Challenges and opportunities for human geography: a few remarks. *Geographia Polonica*, 93, 4, 525-538. https://doi.org/10.7163/GPol.0184.

JAHN, T., BERGMANN, M., KEIL, F. (2012). Transdisciplinarity: Between mainstreaming and marginalization. *Ecological Economics*, 79, 1-10. https://doi.org/10.1016/j.ecolecon.2012.04.017.

JANZWOOD, S., HOMER-DIXON, T. (2022). *What Is a Global Polycrisis*. Discussion Paper 2022–4. , Victoria: Cascade Institute. 7 p. https://cascadeinstitute.org/technical-paper/what-is-a-global-polycrisis/.

JAYASURIYA, K. (2023). Polycrisis or crises of capitalist social reproduction. *Global Social Challenges Journal*, 2, 2, 203-211. https://doi.org/10.1332/KNJY6381.

JUNCKER, J.C. (2016). Speech by President Jean-Claude Juncker at the Annual General Meeting of the Hellenic Federation of Enterprises. 21st June 2016. Athens. https://ec.europa.eu/commission/presscorner/detail/en/SPEECH_16_2293.

KLUTH, A. (2023). So We're In a Polycrisis. Is That Even a Thing? *Washington Post*, https://www.washingtonpost.com/business/so-were-in-a-polycrisis-is-that-even-a-thing/2023/01/21/cf05856e-9963-11ed-a173-61e055ec24ef_story.html.

KOGLER, D. F., EVENHUIS, E., GIULIANI, E., MARTIN, R., UYARRA, E., BOSCHMA, R. (2023). Re-imagining evolutionary economic geography. *Cambridge Journal of Regions, Economy and Society*, 16, 3, 373-390. https://doi.org/10.1093/cjres/rsad029.

KOSKINEN, I., MÄKI, U. (2016). Extra-academic transdisciplinarity and scientific pluralism: what might they learn from one another? *European Journal for Philosophy of Science*, 6, 419-444. https://doi.org/10.1007/s13194-016-0141-5.

KÜPERS, W. (2014). Between Non- and Post-Disciplinarity?! Perspectives on Integral Inter- and Trans-Disciplinary Re-Search. *Integral Leadership Review*, 14, 2. https://integralleadershipreview.com/11426-non-post-disciplininarity/.

LAWRENCE, M. HOMER-DIXON, T., JANZWOOD, S., ROCKSTOM, J., RENN, O., DONGES, J.F. (2024). Global polycrisis: the causal mechanisms of crisis entanglement. *Global Sustainability*, 7,e6, 1-16. https://doi.org/10.1017/sus.2024.1.

LÄHDE, V. (2023). The Polycrisis. Is this the word we need to describe unprecedented convergences between ecological, political and economic strife? *Aeon*. https://aeon.co/essays/the-case-for-polycrisis-as-a-keyword-of-our-interconnected-times.

LEWIS, S.L., MASLIN, M.A. (2015). Defining the Anthropocene. *Nature*, 519, 171-180. https://doi.org/10.1038/nature14258.

LEYSHON, A. (2023). Economic geography II: The economic geographies of the COVID-19 pandemic. *Progress in Human Geography*, 47, 2, 353-364. https://doi.org/10.1177/03091325231156926.

LISZEWSKI, S. (2016). Stan, perspektywy i przyszłość polskiej geografii społeczno-ekonomicznej w opinii geografa, rocznik 1940. In: Suliborski, A. ed. *Stan, perspektywy I strategia rozwoju geografii społeczno-ekonomicznej w najbliższych latach (do 2030 r.).* Dyskusja międzypokoleniowa. Łódź: Wydawnictwo Uniwersytetu Łódzkiego, pp. 19-26.

LIU, W., CHENG, H., HAN, X. (2022). Rebuilding Geography for the 21st century through disciplinary reunification and social engagement. *Environment and Planning F,* 1, 1, 114-124. https://doi.org/10.1177/26349825221082162.

MARK, S.; HOLDER, S., HOYER, D., SCHOONOVER, R., ALDRICH, D. P. (2023). Understanding Polycrisis: Definitions, Applications, and Responses (October 5,

2023). Available at SSRN: https://ssrn.com/abstract=4593383 or http://dx.doi.org/10.2139/ssrn.4593383.

MARTIN, G. (2024). Climate change and mental health and wellbeing: Reflections from a health geography lens. *Geography Compass*, e12734, 1-11. https://doi.org/10.1111/gec3.12734.

MATLOVIČ, R. (2006). Geografia – hľadanie tmelu (k otázke autonómie a jednoty geografie, jej externej pozície a inštitucionálneho začlenenia so zreteľom na slovenskú situáciu). / Geography – search for the Bond (Towards the Issue of the Autonomy and Unity of Geography, its External Position and Institutional Integration with Respect to the Slovak Situation). *Folia Geographica*, 44, 9, 6-43.

MATLOVIČ, R. (2007). Hybridná idiograficko-nomotetická povaha geografie a koncept miesta s dôrazom na humánnu geografiu. *Geografický časopis*, 59, 1, 3-23. 0016-7193.

MATLOVIČ, R. (2009). K problematike novej systemizácie regionálnogeografických poznatkov. *Acta Geographica Universitatis Comenianae*, 53, 11-18.

MATLOVIČ, R.; MATLOVIČOVÁ, K. (2012). Spoločenská relevancia a budovanie značky geografie /The Social Relevance and Branding of Geography. *Geografie,* 117, 1, 33-51. https://doi.org/10.37040/geografie2012117010033.

MATLOVIČ, R.; MATLOVIČOVÁ, K. (2015). *Geografické myslenie/Geographic Thought*. Prešov: Vydavateľstvo Prešovskej univerzity, 321 p. ISBN 978-80-555-1416-1.

MATLOVIČ, R.; MATLOVIČOVÁ, K. (2020). First and second order discontinuities in world geographical thought and their primary reception in Slovak geography. *Folia Geographica*, 62, 1, 52-76. http://www.foliageographica.sk/unipo/journals/2020-62-1/556.

McGREGOR, S.L.T. (2007). Consumer scholarship and transdisciplinarity. *International Journal of Consumer Studies*, 31, 487-495. https://doi.org/10.1111/j.1470-6431.2007.00599.x.

MILES, H.J. (2023). Practising difference across geography: A transdisciplinary and Deleuzian approach to intradisciplinary thinking. *Environment and Planning, F*, 2, 4, 495-514. https://doi.org/10.1177/26349825231200607.

MORIN, E. (1992). From the concept of system to the paradigm of complexity. *Journal of Social and Evolutionary Systems*, 15, 4, 371-385. https://doi.org/10.1016/1061-7361(92)90024-8.

MORIN, E. (2001). *Seven Complex Lessons in Education for the Future*. Paris: UNESCO, Education on the Move. 95 p. ISBN 978-92-3-103778-8.

MORIN, E., KERN, A.B. 1999. *Homeland Earth: A Manifesto for a New Millennium (Advances in Systems Theory, Complexity and the Human Sciences)*. Cresskill, N.J.: Hampton Press, 153 p., ISBN 978-1572732483.

MUNAR, A. M., PERNECKY, T., FEIGHERY, W. (2016). An Introduction to Tourism Postdisciplinarity. *Tourism Analysis*, 21, 4, 343-347. https://doi.org/10.3727/108354216X14600320851578.

NOLAN, A. (2023). Human rights and the cost-ofliving crisis. *Netherlands Quarterly of Human Rights*, 41, 1, 3-12. https://doi.org/10.1177/09240519231156060.

ORLOV, D. (2013). *The five he Five Stages of Collapse: Survivors' Toolkit*. New Society Publishers. ISBN 978-0865717367.

OŤAHEĽ, J., MATLOVIČ, R., MATLOVIČOVÁ, K., MICHAELI, E., VILČEK, J. (2019). Critical Approaches, Integration of Research and Relevance of Geography. *Geografický časopis*, 71, 4, 341-361. https://doi.org/10.31577/geogrcas.2019.71.4.18.

PAINTER, J. (2003). Towards a post-disciplinary political geography. *Political Geography*, 22, 6, 637-639. https://doi.org/10.1016/s0962-6298%2803%2900070-2.

PERNECKY, T., MUNAR A. M., FEIGHERY, W. (2016). Tourism in a Postdisciplinary Milieu: Final Demarcation Points. *Tourism Analysis*, 21, 4, 431-434. https://doi.org/10.3727/108354216X14600320851578.

ROITMAN, J. (2013). *Anti-Crisis.* Durham: Duke University Press. 176 p. 978-0-8223-5527-4.

SAYER, A. (2000). For Postdisciplinary Studies: Sociology and the Curse of Disciplinary Parochialism/Imperialism In: Eldridge, J. et al. eds. *For Sociology: Legacies and Prospects*. Durham: Sociologypress, pp. 85-97.

SHEPPARD, E. (2022). Geography and the present conjuncture. *Environment and Planning, F*, 1, 1, 14-25. https://doi.org/10.1177/26349825221082164.

SIAL, F.. (2023). Whose polycrisis? *Developing Economics*, 27 January. https://developingeconomics.org/2023/01/27/whose-polycrisis/

ŞIMANDAN, D. (2005). *New Ways in Geography*. Timisoara: Editura Universitatii de Vest/ West University Press, 230 p.

SØGAARD JØRGENSEN, P., JANSEN, R. E. V., AVILA ORTEGA, D., WANG-ERLANDSSON, L., DONGES, J. F., ÖSTERBLOM, H., OLSSON, P., NYSTRÖM, M., LADE, S. J., HAHN, T., FOLKE, C., PETERSON, G. D., CRÉPIN, A. S. (2023). Evolution of the polycrisis: Anthropocene traps that challenge global sustainability. *Philosophical Transactions of the Royal Society, B* 379:20220261. 1-17. https://doi.org/10.1098/rstb.2022.0261.

STANDISH, A. (2019). Decolonizing Geography and Access to Powerful Disciplinary Knowledge. *Journal of Geographical Research* , 2, 3, 1–11. https://doi.org/10.30564/jgr.v2i3.898

SWILLING, M. (2013). Economic Crisis, Long Waves and the Sustainability Transition: An African Perspective. *Environmental Innovation and Societal Transitions*, 6 (March): 96–115. https://doi.org/10.1016/j.eist.2012.11.001.

SWILLING, M. (2019). Long Waves and the Sustainability Transition. In *Handbook of Green Economics*, 31–51. Elsevier. https://doi.org/10.1016/B978-0-12-816635-2.00003-1.

THOMAS, D. SG. (2022). Geography needs science, science needs Geography. *Environment and Planning, F*, 1, 1, 41-51. https://doi.org/10.1177/26349825221082161.

TOOZE, A. (2022). Welcome to the world of the polycrisis. *Financial Times*, 28 October, https://www.ft.com/content/498398e7-11b1-494b-9cd3-6d669dc3de33.

WALSH, Z. (2023). *The Global Polycrisis Reflects a Civilizational Crisis that Calls for Systemic Alternatives*. Omega Resilience Funders Network. https://omega.ngo/2023/06/the-global-polycrisis-reflects-a-civilizational-crisis-that-calls-for-systemic-alternatives/.

WEF, (2023). *The Global Risks Report 2023*. 18th edition. Geneva: World Economic Forum. ISBN-13: 978-2-940631-36-0. https://www3.weforum.org/docs/WEF_Global_Risks_Report_2023.pdf

WILCZYŃSKI, W. (2003). *Autonomia i jedność geografii. Studium Metodologiczne*. Łódź: Łódzkie Towarzystwo Naukowe, 74 s. ISBN 83-87749-63-X.

WILSON, J. (2011). Tourism geographies in a post-disciplinary age. In Wilson, J., ed., *The Routledge Handbook of Tourism Geographies*. London: Routledge, pp. 251-254.

WOLMARK, J., GATES-STUART, E. (2004). Cultural hybrids, post-disciplinary digital practices and new research frameworks: Testing the limits. In *Conference: PixelRaiders2At*: Sheffield Hallam University, UKVolume: ISBN 1843870606 9781843870609.

WOODS, M. (2023). Rural recovery or rural spatial justice? Responding to multiple crises for the British countryside. *The Geographical Journal*, 1-10. Online Version of Record before inclusion in an issue, https://doi.org/10.1111/geoj.12541.

YEUNG, H. W. (2023) Troubling economic geography: New directions in the post-pandemic World. *Transactions of the Institute of British Geographers*, 48, 4, 672-680. https://doi.org/10.1111/tran.12633.

ŽIGRAI, F. (2013). Poznávanie geografickej reality v časovo-priestorovej kontextualite, komplexnosti a integrite. *Folia Geogra*phica, 55, 22, 46-68.

GEOGRAPHY OF THE "COMBINATION EFFECT": HOW HOLDING TWO SECOND-ORDER ELECTIONS AT THE SAME TIME CONTRIBUTES TO TURNOUT

Dominik KEVICKÝ ᴬ*, Petr DANĚK ᴮ

A* Department of Geography Masaryk university, 61137, Brno, Czechia
   🆔 https://orcid.org/0000-0003-2913-9674, *kevicky.dominik@mail.muni.cz*
   (corresponding author)

B Department of Geography Masaryk university, 61137, Brno, Czechia
   🆔 https://orcid.org/0000-0002-7649-4153, *danek@sci.muni.cz*

Abstract

The big issue for democratic societies is to get as many people as possible to vote. Low voter turnout is particularly typical of second-order elections. There are several ways to increase voter turnout. One way is to hold several elections on the same day, as happened in 2022 in Slovakia. Regional and municipal elections were held on the same day, and the question arises of how this combination changed the voter turnout in the Slovak regional elections. This paper aims to conduct a geographical analysis of regional elections in Slovakia in 2017 and 2022. Based on this analysis, it answers whether there has been an increase in voter turnout as an effect of holding elections simultaneously, and it identifies types of municipalities where this increase has occurred. The analysis employs methods of spatial analysis (Moran's I criterion, the univariate and bivariate local indicator of spatial autocorrelation). The results show that the most significant increase in voter turnout occurred in the municipalities where there was the most significant difference in turnout between the 2017 regional elections and the 2018 municipal elections. The results also show that the 2022 regional elections resemble more closely the 2018 and 2022 municipal elections regarding the spatial distribution of voter turnout. Thus, the analyses confirm that the increase in turnout in the 2022 regional elections was also due to the combination of these elections with the municipal elections. However, it should also be noted that this increase is spatially differentiated, which gives room for further geographical analyses.

Key words

Turnout, second-order elections, regional elections, spatial analysis, Slovakia.

INTRODUCTION

"Vote!" is heard from candidates on all sides of the political spectrum before elections. Geography of electoral turnout, or the different levels of mobilisation of voters from different regions and social groups, can significantly influence the outcome of an election. Despite the key role of elections in democratic societies and repeated attempts at mobilisation of voters, voter turnout shows a downward trend since the 1980s, observed both globally and in most regions of the world (Franklin, 2004, Solijonov 2016). The decline in turnout in post-socialist countries of Central and Eastern Europe has been faster than in established European democracies (Solijonov 2016). Low turnout rates have been considered a "serious democratic problem" by both politicians and political scientists (Lijphart, 1997, p. 1).

Electoral participation is even weaker in the second-order elections, which do not elect legislative bodies, compared to the first order elections (Reif and Schmitt, 1980). Several strategies have been attempted to increase voter turnout in second-order elections. One of them is to hold multiple elections at the same date (Mattila, 2003; Schakel and Dandoy, 2014; Leininger et al., 2018). The aim of the paper is to analyse the effect of this strategy in the elections of the members of regional assemblies ("regional elections") in Slovakia.

The turnout in the regional elections in Slovakia has not exceeded 30 % since the introduction of these elections in 2001. This changed only in 2022, when, for the first time, the regional elections were held at the same time as the municipal elections, resulting in the rise in participation to 44 % (see tab. 1). Clearly, the combination of the two second-order elections was a successful strategy to achieve higher voter turnout. What is not known, however, is the geography of the "combination effect", or the spatial differences in the turnout increase due to holding regional elections simultaneously with the municipal elections. Knowledge of the geography of the "combination effect" can be useful for understanding voter behaviour and, potentially, for the formulation of further strategies aimed at increasing electoral participation.

The aim of the paper is to describe, analyse and interpret the geography of turnout increase in the 2022 regional elections in Slovakia, as compared to the previous regional elections, where the turnout was considerably lower. The map of turnout is complex, as is any map of electoral results. It may be influenced by the socio-economic structure of voters and by the geographical factors such as issue voting or neighbourhood effect (REF). It is differentiated both horizontally (differences between municipalities and regions) and vertically (differences across settlement hierarchy). Each elections produce a different map of outcomes. Particularly important for the objective of the article is the analysis of the relation between turnout in the regional elections and turnout in the other second-order elections with which these elections were combined, i.e. the communal elections.

To understand the complexity of factors influencing the map of voter turnout in regional elections, and its increase due to combination effect, four related questions are investigated in the following analysis.

First, the vertical differentiation of the increase in turnout is analysed, investigating the distribution of the increase in turnout among the population size categories of municipalities. In which size categories of municipalities was the combination effect most profound?

Second, the horizontal differentiation of the increase is described, with the particular attention paid to the changes in regional elections turnout maps between 2017 and 2022. In which regions was the change most significant?

Third, and most importantly for the objective of the paper, the relation between turnout in municipal elections and increase in regional elections turnout will be investigated. Was this increase (as a proxy for the combination effect) more significant in municipalities and regions with low or high participation in municipal elections? How close is the relation between the level of turnout in both types of elections, when analysed geographically?

The following section introduces the literature review about voter turnout, second-order election theory and how this theory explains the turnout rate. The third section summarisesthe history of regional elections in Slovakia and the evolution of turnout in these elections. That is followed by a section introducing the data and methods used in this paper. The next chapter presents the results of the analyses, and the last chapter summarises the paper's results.

TURNOUT IN SECOND-ORDER ELECTIONS

The factors influencing turnout became the focus of several analyses in political science, sociology, and geography (Reif and Schmitt, 1980; Pacek et al., 2009; Schulz-Herzenberg, 2019). Despite the growing number of studies of turnout in second-order elections, some types of elections have been studied more than others. Most papers dealt with turnout in the European Parliament elections or municipal elections (e.g., Reif and Schmitt, 1980; Lefevere and van Aelst, 2014; Leininger et al., 2018; Schmitt et al., 2020). By contrast, participation in regional elections, i. e. elections to meso-level representative bodies between the local and national levels rarely becomes the subject of research (Henderson and McEwen, 2015; Avdic and Avdic, 2023).

The low attention paid to regional elections stands in contrast to the rising significance of regional assemblies, and regional elections, in recent decades (Schakel 2011). The geographical research on regional elections and turnout in regional elections focused mainly on an international comparison (Schakel 2011, 2015). There have been few geographically focused studies attempting to capture

the spatial distribution of turnout in regional elections at the municipal-level detail, and changes in turnout over time.

As recently as 2016, Plešivčák et al. (2016) claimed that there has been no long-term and systematic geographical research on voter turnout in Slovakia. Most authors address the issue of turnout only as a secondary part of an analysis of elections in Slovakia (e.g., Madleňák, 2012; Kostelecký and Krivý, 2015; Rybář et al., 2017). Only few articles so far focused their primary attention at the geography of turnout in Slovakia; the major exceptions are Mikuš and Gurňák (2014), Kevický (2020a), Kevický (2020b), Kevický and Daněk (2020). However, except for the first paper, these authors analysed the geography of turnout in the parliamentary elections, i.e. the first-order elections. Mikuš and Gurňák (2014) examined voter turnout in second-order elections, including regional elections, but their analysis was geographically limited to the particular region of Košice. No systematic research on the spatial distribution of voter turnout in regional elections has yet been undertaken.

The second-order election theory is the most widely used conceptual framework for interpretation of turnout and results of regional elections. The theory builds on a premise that there is a hierarchy in voters' view of the importance of elections, with national elections considered first-order elections, and all other elections, including European, municipal, or regional elections, considered secondary (Reif and Schmitt, 1980; Marsh, 1998; Koepke and Ringe, 2006). Turnout is usually low in second-order elections because the stakes are lower in the eyes of voters, than in the first-order elections. Voters who turn out to vote in second-order elections often use their vote as an expression of satisfaction with the national-level politics (Reif and Schmitt, 1980). Therefore, political parties that participate in the national government tend to weaken in second-order elections if voters are dissatisfied with the national politics. Conversely, opposition, minor, or new political parties often gain votes of dissatisfied voters (Rybář and Spáč, 2017). The secondary status is reinforced by lower attention paid to second-order elections from politicians, party activists, and media, and by usually only a moderate campaign before the elections.

A strategy to raise voter turnout in second-order elections is to hold these elections on the same day as other elections. Several studies (Boyd, 1989; Schakel and Dandoy, 2014; Vetter, 2015) confirmed that turnout increased when second-order elections were held at the same time as first-order elections. The turnout of second-order elections can also be increased when elections are combined with other second-order elections, characterized by a slightly higher turnout (Mattila, 2003; Rallings and Thrasher, 2005; Leininger et al., 2018). This was the case of regional elections in Slovakia in 2022.

REGIONAL ELECTIONS IN SLOVAKIA

Since 1970, Slovakia was divided into four regions (Western Slovakia, Central Slovakia, Eastern Slovakia, and Region of Bratislava) led by the formally elected Regional Peoples' Councils. Elections were organised and always won by the Communist Party of Slovakia, with no opposition parties allowed to compete before 1989 (Rybář and Spáč, 2017). The Regional Peoples' Councils, as bodies of executive power at the regional level, were dismantled in 1990, to be replaced by eight regions, called *higher territorial administrative units*, in 1996. However, these were governed by the regional branches of the central government with no self-governing bodies. Regional assemblies as bodies of regional self-government were established for the above-mentioned eight regions after complex negotiations in 2001 (Rybář and Spáč, 2017). The competencies of regional assemblies are secondary to the national executive, but they enjoy autonomy in the wide range of policies such as education, health, transport or regional policy.

Six competitive elections of regional assemblies' members were held since 2001. The plurality system is used in regional elections in Slovakia. Voters do not choose political parties but individual candidates, who may be members of a political party or independent candidates. Each of the eight self-governing regions is divided into several constituencies in which the voter chooses a certain number of candidates, depending on the population size of the constituency. The number of constituencies varies between 7 (Region of Trnava) and 24 (Region of Bratislava). The candidates who receive most of the votes in the given constituency are elected.

The influential position of the chairman of the self-governing region was elected in the two-round system till 2013. It was replaced by the one-round system in 2017. Another change, more important for the development of voter turnout, also came into force in 2017: the term of office of the regional assemblies was extended from four to five years so that the regional elections could be held regularly at the same time as the municipal elections, which has been organised every four years since 1992. That happened for the first time in 2022.

Only about a quarter of voters participated in the first regional elections in 2001. The turnout was even lower in the next three elections (see Table 1). Looking in the map of turnout in these early elections, the above-average turnout was observed regularly in the regions where the candidates from political parties representing the Hungarian-speaking population stood for election. An increase in voter turnout occurred in 2017, when a plurality system of regional chairman election was introduced. It resulted in an increase in turnout from 20 to 30 percent at the national level. The highest turnout was observed in the Region of Banská Bystrica, where the contest between a liberal candidate and the national leader of the populist radical right People's Party Our Slovakia attracted to ballots 40 % of voters.

Another increase in voter turnout occurred in 2022, when the election of regional assembly members was combined, for the first time, with municipal elections. This change resulted in participation of 44 % of voters in regional elections, only two percent less than was the turnout in the municipal elections. Turnout in both types of elections was very similar not only at the national level, but also in the individual regions (see Figure 1). This was a strong manifestation of the "combination effect".

Tab. 1 Voter turnout in regional elections in Slovakia

Region	2001	2005	2009	2013	2017	2022
Region of Bratislava (BA)	24 %	14 %	19 %	22 %	31 %	39 %
Region of Trnava (TT)	34 %	15 %	20 %	17 %	25 %	43 %
Region of Trenčín (TN)	22 %	12 %	21 %	17 %	26 %	45 %
Region of Nitra (NR)	35 %	28 %	22 %	18 %	27 %	43 %
Region of Žilina (ZA)	23 %	16 %	24 %	22 %	34 %	49 %
Region of Banská Bystrica (BB)	24 %	19 %	27 %	25 %	40 %	45 %
Region of Prešov (PO)	26 %	19 %	26 %	22 %	29 %	48 %
Region of Košice (KE)	22 %	19 %	23 %	18 %	27 %	40 %
Slovakia (SR)	26 %	18 %	23 %	20 %	30 %	44 %

Notes: The highest and the lowest values in the individual elections are highlighted.
Voter turnout in the years 2001-2013 refer to the first round of elections.
Data source: Statistical Office of the Slovak Republic 2022
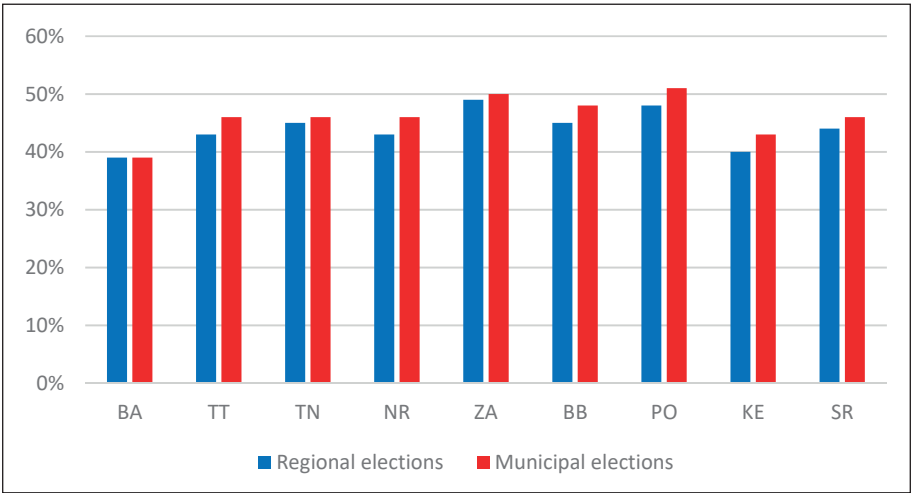
Fig. 1 Voter turnout in the regional and municipal elections in 2022 in the regions of Slovakia (for explanation of abbreviations see table 1)
Data source: Statistical Office of the Slovak Republic 2022

DATA AND METHODS

While the simple comparison of the regional elections turnout in 2017 and 2022 clearly confirms the presence of the "combination effect", at both the national and regional levels (Tab. 1), a closer look at geography of this effect provides a more complex picture. This picture was discerned using the municipality-level data on turnout in regional and municipal elections.

The dependent variable, analysed in this contribution, was calculated as a difference between regional elections turnout in 2022 and 2017. Since this difference was positive in all but few Slovak municipalities we call it increase. This variable it considered a proxy for the combination effect, because it directly compares turnout in the regional elections held at the same time as municipal elections (the 2022 elections) with those held independently (the 2017 elections). The geography of the dependent variable is visualised in the Figure 2.

Figure 2 shows that the smallest increase in voter turnout was observed in the municipalities of the Region of Banská Bystrica. It is an effect of high mobilisation of voters by the nationalist leader Marián Kotleba in the 2017 regional elections. Low values of the combination effect were also in the largest Slovak cities. In contrast, high values of the combination effect were not significantly spatially concentrated.
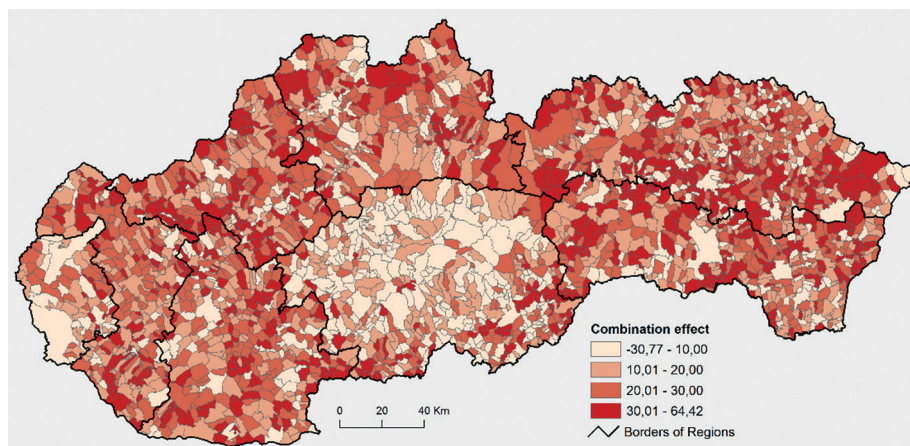
Fig. 2 The difference in voter turnout between 2022 and 2017
regional elections

The methods selected to analyse the geography of the turnout increase correspond to the research questions, outlined in the Introduction.

First, the distribution of the turnout increase across population size categories of municipalities (the vertical differentiation of the increase) was analysed using a simple tabulation (see Table 2). The municipalities of Slovakia were divided into

ten standard categories based on the number of inhabitants in 2022. The average turnout in regional and municipal elections was calculated for each size category.

Second, the spatial autocorrelation using Moran's I statistic (Cliff and Ord, 1981) was used to explore the geographical differences in turnout between the 2017 and 2022 regional elections. Values close to zero indicate spatial independence; the higher the values, the higher the spatial dependence of the variable. The type of matrix used in the analysis plays an essential role in calculating Moran's I criterion. Method of continuous matrices, based on the distance between spatial units and assuming that the intensity of interactions decreases with distance (Maškarinec, 2014), was used in construction of spatially weighted matrices. Fixed distance of 10 km between spatial units (Slovak municipalities) was used in the analysis. The value of 10 kilometres was chosen on the basis of previous research (Spurná, 2008; Maškarinec, 2014; Kevický, 2020b). The distance was measured from the geometric centre of the municipality.

Moran's I is an overall measure of the linear association whose single value is valid for the entire study area (all Slovak municipalities). Since this paper aims to explore the regional differences in the "combination effect", a local indicator of spatial association (LISA) was calculated to gain a more detailed insight into the presence of spatial clusters of municipalities with either high or low turnout. The univariate LISA was calculated for each municipality. It provides information about the degree and nature of clustering around each observation (municipality) by determining the contribution each observation makes to the overall global statistic (Shin and Agnew, 2007). The univariate LISA values identify positive spatial dependence (high values surrounded by similarly high values or low values surrounded by similarly low values) or spatial outliers (high values surrounded by low values or low values surrounded by high values). The results of the univariate LISA are presented in table 3 and figures 3 and 4.

Third, a simple regression analysis was used to measure the statistical dependence of the dependent variable (increase in regional elections turnout) on a single independent variable: turnout in the 2022 municipal elections. Standardised regression coefficient describes the nature of the statistical relation between dependent and independent variables, and adjusted R square value quantifies the percentage of variability in dependent variable explained by the independent variable.

Fourth, bivariate LISA was used to analyse differences in spatial distribution of turnout in three pairs of elections: the 2017 regional elections vs the 2022 regional elections, the 2017 regional elections vs the 2018 municipal elections, and the 2022 regional elections vs the 2022 municipal elections. While the univariate LISA results show the clustering of municipalities in a single election, bivariate LISA indicators can compare spatial differences between pairs of elections (Anselin, 1995). The bivariate LISA was calculated similarly as the univariate LISA, but the

mutual spatial autocorrelation between the turnout in two elections was analysed in this case. That allows for the comparison of clustering between pairs of elections. The results of the bivariate LISA are presented in table 5 and in pictures 5, 6 and 7.

The data were collected at the level of municipalities (2 889 administrative territorial units). The source of data on voter turnout was the Statistical Office of the Slovak Republic (2022).

RESULTS

First, the combination of regional and local elections significantly changed the distribution of turnout across size categories of municipality. In the 2017 regional elections, the average turnout in individual size categories ranged from 27 to 38 per cent (see Table 2). The distribution of turnout formed a U-curve, with low values in small and medium-sized towns and large rural municipalities (municipalities with population 1 000 to 50 000) and higher values in both small rural municipalities (population below one thousand) and larger towns and cities (population 50 000+). This distribution changed significantly in 2022. In contrast to the previous regional elections, the average turnout values were trending downward with increasing population size of municipality (high turnout in small municipalities, low turnout in cities) - see table 2. This distribution across size categories thus became similar to the distribution of turnout in the municipal elections (both 2018 and 2022 elections).

Tab. 2 Voter turnout in regional and municipal elections in the population
size categories of Slovak municipalities

Municipal size category (population number)	Regional elections			Municipal elections	
	2017	2022	Difference	2018	2022
1 - 199	38%	50%	12 p.p.	63%	62%
200 - 499	34%	50%	16 p.p.	61%	59%
500 - 999	30%	51%	21 p.p.	60%	59%
1 000 - 1 999	29%	49%	20 p.p.	57%	55%
2 000 - 4 999	27%	45%	18 p.p.	54%	51%
5 000 - 9 999	30%	44%	14 p.p.	49%	45%
10 000 - 19 999	28%	40%	12 p.p.	43%	40%
20 000 - 49 999	28%	37%	9 p.p.	40%	37%
50 000 - 99 999	36%	40%	4 p.p.	41%	40%
100 000+	31%	35%	4 p.p.	39%	35%

*Data source: Statistical Office of the Slovak Republic 2022*

Important for the objective of the paper is the finding that the bigger the difference in turnout between the 2017 regional elections and 2018 municipal elections the higher increase in turnout in the 2022 regional elections. The analysis shows convincingly that the combination effect was the biggest in those size categories of municipalities where the turnout used to be very low. At the same time, the lowest increase was observed in bigger towns and cities where turnout in municipal elections used to be is low. It shows that the effect of combining two second-order elections has significant influence on turnout, but this effect is distributed unevenly, with rural municipalities gaining more from the change in the electoral law than the cities.

Second, Moran's I score was computed for voter turnout in regional elections held in 2017 and 2022, and municipal elections held in 2018 and 2022 (see Table 3). The high Moran's I score indicates the considerable level of systematic spatial clustering in the 2017 regional elections. In contrast, Moran's I score declined significantly in the 2022 regional elections, bringing the level of spatial clustering closer to the values achieved in the municipal elections. A weak spatial variation of voter turnout is typical for municipal elections in Slovakia.

Tab. 3 Moran's I score for voter turnout in regional and municipal elections

	2017	2018	2022
Regional elections	0.341	-	0.109
Municipal elections	-	0.060	0.058

The reduction in spatial clustering is also evident in the comparison of the LISA analysis results for regional elections in 2017 (Figure 3) and 2022 (Figure 4). Figure 2 shows a high spatial concentration of municipalities with either high or low voter turnout in the 2017 regional election, with significant clustering occurring in several parts of the country. Clusters of high voter turnout were situated mainly in the Region of Banská Bystrica and the northern and northeast parts of Slovakia, while clusters of low turnout were situated mainly in the west and southwest. The figure 3 shows a significantly lower level of spatial concentration in 2022. The cluster of positive autocorrelation in central Slovakia (the Region of Banská Bystrica) has disappeared, while the clusters of negative autocorrelation in the west, southwest and east have disintegrated and became smaller. The cluster in the northeast (the Region of Prešov) has expanded and became the most spatially extensive.
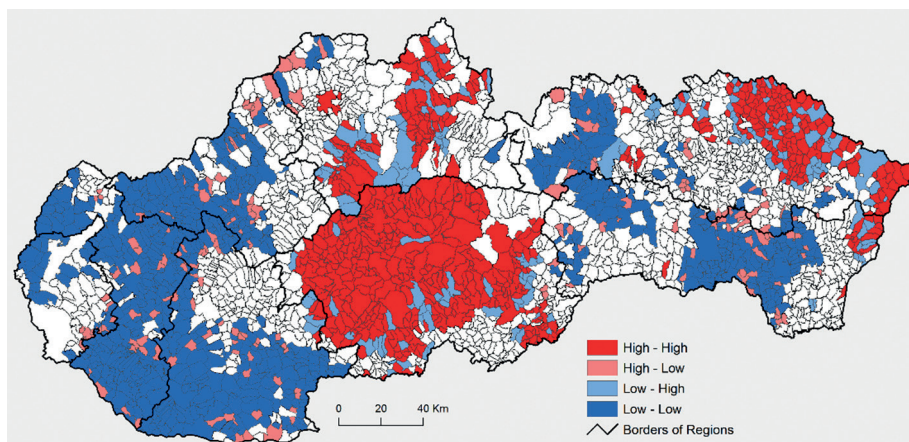
Fig. 3 LISA cluster map of voter turnout in the 2017 regional elections
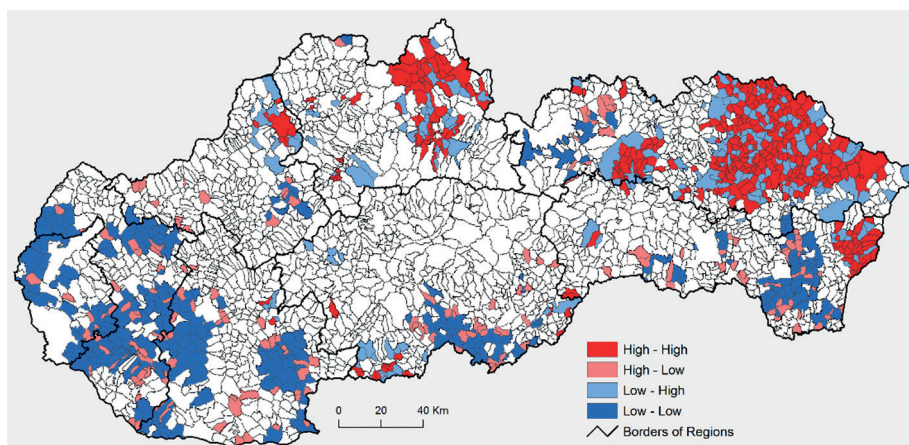
Fig. 4 LISA cluster map of voter turnout in the 2022 regional elections

How voter turnout in the 2022 municipal elections did affected the increase in turnout in regional elections? The results of a simple weighted regression, with the increase in regional elections turnout between 2017-2022 standing as the dependent variable and the 2022 municipal elections turnout as independent variable, show that the independent variable was able to explain one-third of the variability of dependent variable. When bivariate LISA is applied on these two variables (see Figure 5), it can be seen that high combination effect and high voter turnout were mainly in the north-eastern part of Slovakia while municipalities with low voter turnout and low combination effect cluster mainly in the south-western part of Slovakia.
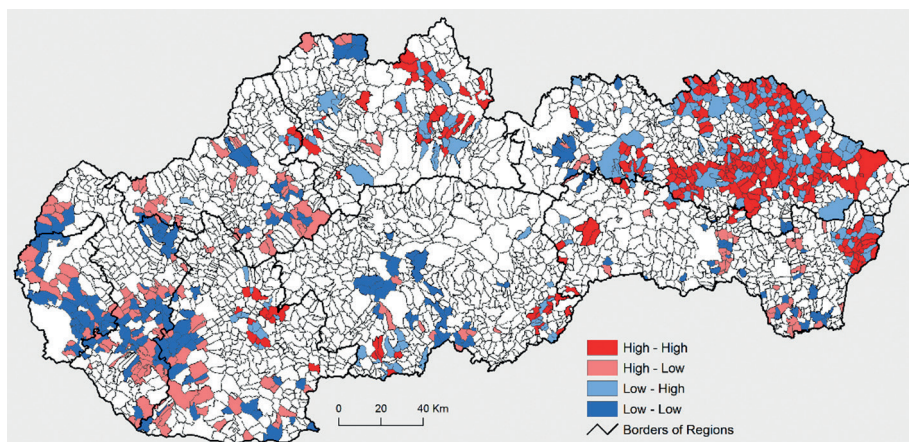
Fig. 5 Bivariate LISA cluster map of the difference in voter turnout between
2022 and 2017 regional elections with voter turnout in 2022 municipal elections
(The first word in the legend indicated the values of the first variable,
and the second word the values of the second variable. For example,
the Low - High means that combination effect was low, while it was high
in the 2022 municipal elections.)

The previous analysis confirmed that the increase in regional elections turnout is affected by the turnout in municipal elections. However, how close are regional and municipal elections to each other in terms of spatial distribution of turnout? A comparison of bivariate Moran's I scores for voter turnout in regional and municipal elections across years provides an answer (see Table 4). The bivariate Moran's I score is higher for the pair of regional and municipal elections in 2022 than for the pair of the same elections held four/five years earlier. This implies that high or low turnout in regional and municipal elections is more concentrated in the same locations. Thus, few municipalities have opposite turnout values in regional and municipal elections. It is noticeable that spatial outliers have disappeared in the Region of Banská Bystrica (see Figure 6 and 7).

Tab. 4 Bivariate Moran's I score for voter turnout in regional and municipal elections

	Moran's I score
2017 regional / 2018 municipal	0,059
2022 regional / 2022 municipal	0,073

Data source: Statistical Office of the Slovak Republic 2022
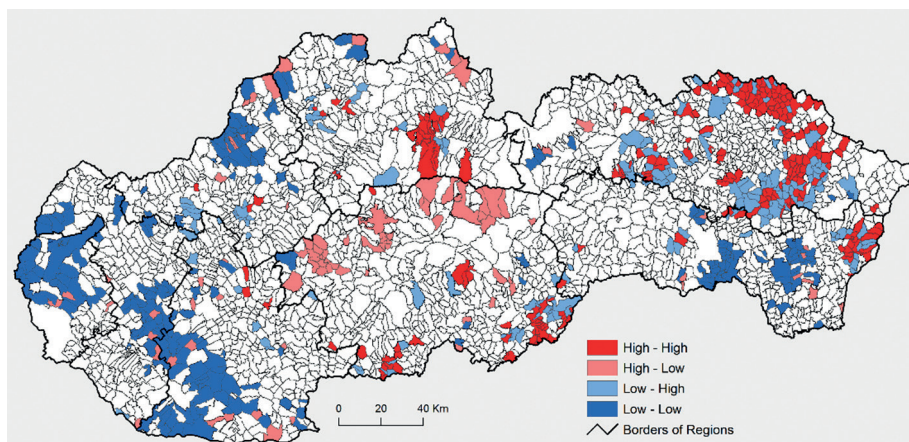
Fig. 6 Bivariate LISA cluster map of voter turnout in 2017 regional elections and voter turnout in 2018 municipal elections
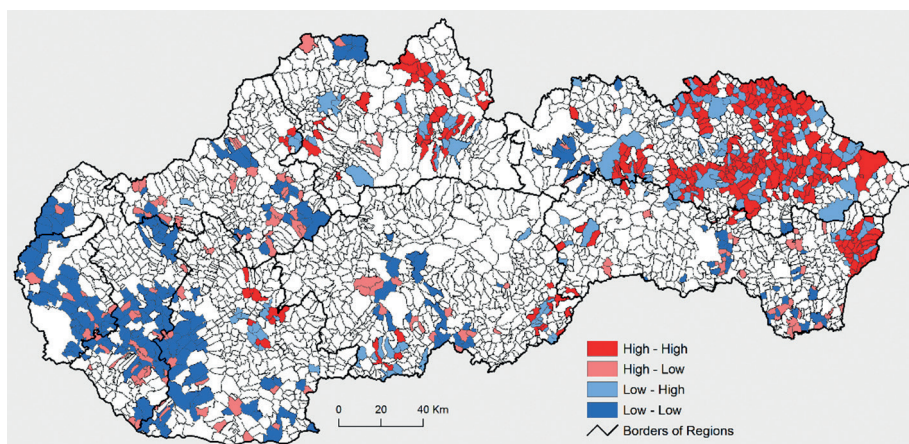
Fig. 7 Bivariate LISA cluster map of voter turnout in 2022 regional elections with voter turnout in 2022 municipal elections

CONCLUSIONS

The article analysed the geographical distribution of voter turnout in regional elections in Slovakia and changes to it brought by the combination effect, i.e. holding regional elections simultaneously with municipal elections. Initial analyses showed that turnout in regional elections increased after they were held at the same time as municipal elections. Turnout in regional elections is higher in municipalities with higher turnout in municipal elections. That was valid in the 2018 regional elections, but even more strongly in the 2022 regional elections, which were held at the same time with municipal elections. The second finding

is that high combination effect and high voter turnout were mainly in the north-eastern part of Slovakia while municipalities with low voter turnout and low combination effect cluster mainly in the south-western part of Slovakia. The third finding is that the highest increase in voter turnout in regional elections occurred in municipalities, with the highest difference between turnout in previous regional and municipal elections.

All these findings confirm that the turnout in second-order elections is affected when elections are combined with other second-order elections, characterized by a slightly higher turnout. This knowledge is consistent with findings of Mattila (2003), Rallings and Thrasher (2005) and Leininger et al. (2018). This suggests that combining multiple elections can be a workable tool for increasing voter turnout. However, it should also be noted that the spatial differentiation of voter turnout depends to a large extend on the characteristics of the political competition that took place in individual regions in individual elections.

The findings may be relevant for scholars and policy makers interested in designing strategies to increase voter turnout in second-order elections. Most European countries struggle with a low turnout in second-order elections, and it is important to examine strategies aimed at increasing the electoral participation. The analysis of the Slovak experience offers opportunities to assess the effect of combining two second-order elections. However, it should also be noted that the increase in voter turnout is spatially differentiated. Therefore, studying the geography of voter turnout not only in regional elections is crucial.

REFERENCES

ANSELIN, L. (1995). Local indicators of Spatial Association-LISA. *Geographical Analysis*, 27(2), 93-115. DOI: 10.1111/j.1538-4632.1995.tb00338.x.

AVDIC, A., AVDIC, B. (2023). Center and Periphery in Bosnia and Herzegovina – Social and Spatial Indicators of Regional Disparities. *Folia Geographica*, 65(2), 103-126.

BOYD, R. W. (1989). The Effects of Primaries and Statewide Races on Voter Turnout. *The Journal of Politics*, 51(3), 730-739. DOI: 10.2307/2131504.

CLIFF, A. D., ORD, J. K. (1981). Spatial Processes: Models and Applications. London: Pion.

FRANKLIN, M. N. (2004). Voter turnout and the dynamics of electoral competition in established democracies since 1945. Cambridge: Cambridge University Press.

HENDERSON, A., MCEWEN, N. (2015). Regions as primary political communities: A multi-level comparative analysis of turnout in regional elections. *Publius: The Journal of Federalism*, 45(2), 189-215. DOI: 10.1093/publius/pju040.

KEVICKÝ, D. (2020a). Priestorové rozloženie volebnej účasti v parlamentných voľbách v slovenských okresoch v rokoch 1990 až 2016. *Geographia Cassioviensis*, 14(1), 64-76. DOI: 10.33542/GC2020-1-04.

KEVICKÝ, D. (2020b). Volebná účasť na Slovensku v roku 2020 z pohľadu geografie – zmena alebo stabilita? *Acta Geographica Universitatis Comenianae*, 65(2), 161-178.

KEVICKÝ, D., DANĚK, P. (2020). Kde sa chodí voliť? Faktory ovplyvňujúce geografické rozloženie volebnej účasti v slovenských parlamentných voľbách. *Geografický časopis*, 72(1), 5-25. DOI: 10.31577/geogrcas.2020.72.1.01.

KOEPKE, J. R., RINGE, N. (2006). The Second-order Election Model in an Enlarged Europe. *European Union Politics*, 7(3), 321–346. DOI: 10.1177/1465116506066259.

KOSTELECKÝ, T., KRIVÝ, V. (2015). Urbánno-rurálne rozdiely voličského správania v Česku a na Slovensku. *Sociológia – Slovak Sociological Review*, 47(4), 390-413.

LEFEVERE, J., VAN AELST, P. (2014). First-order, second-order or third-rate? A comparison of turnout in European, local and national elections in the Netherlands. *Electoral Studies*, 35, 159-170. DOI: 10.1016/j.electstud.2014.06.005.

LEININGER, A., LUKAS, R., ZITTLAU, S. (2018). How to Increase Turnout in Low-Salience Elections: Quasi-Experimental Evidence on the Effect of Concurrent Second-Order Elections on Political Participation. *Political Science Research and Methods*, 6(3), 509-526. DOI: 10.1017/psrm.2016.38.

LIJPHART, A. (1997). Unequal participation: democracy's unresolved dilemma. *American Political Science Review*, 91(1), 1-14. DOI: 10.2307/2952255.

MADLEŇÁK, T. (2012). Regionálna diferenciácia volebného správania na Slovensku (1998- 2010). Bratislava: Veda.

MARSH, M. (1998). Testing the Second-Order Election Model after Four European Elections. *British Journal of Political Science*, 28(4), 591-607. DOI: 10.1017/S000712349800026X.

MAŠKARINEC, P. (2014). Volební geografie Libereckého kraje 1992–2010. Voličské chování z pohledu explorační prostorové analýzy dat (ESDA). Brno: Centrum pro studium demokracie a kultury.

MATTILA, M. (2003). Why bother? Determinants of turnout in the European elections. *Electoral Studies*, 22(3), 449–468. DOI: 10.1016/S0261-3794(01)00054-3.

MIKUŠ, R., GURŇÁK, D. (2014). Špecifiká volebnej účasti v obciach Košického kraja vo voľbách na rôznych úrovniach v rokoch 1999–2014. *Geographia Cassioviensis*, 8(2), 150-161.

PACEK, A. C., POP-ELECHES, G., TUCKER, J. A. (2009). Disenchanted or discerning: voter turnout in post-communist countries. *Journal of Politics*, 71(2), 473-491. DOI: 10.1017/S0022381609090409.

PLEŠIVČÁK, M., BUČEK, J., BAČÍK, V., KUSENDOVÁ, D. (2016). Theoretical and methodological notes on current options related to examination of voting behaviour – The geographical approach. *Acta Geographica Universitatis Comenianae*, 60(2), 151–170.

RALLINGS, C., THRASHER, M. (2005). Not All 'Second-Order' Contests are the Same: Turnout and Party Choice at the Concurrent 2004 Local and European Parlia-

ment Elections in England. *The British Journal of Politics and International Relations*, 7(4), 584–597. DOI: 10.1111/j.1467-856x.2005.00207.x.

REIF, K., SCHMITT, H. (1980). Nine Second-Order National Elections - A Conceptual Framework for the Analysis of European Election Results. *European Journal of Political Research*, 8, 3–44. DOI: 10.1111/j.1475-6765.1980.tb00737.x.

RYBÁŘ, M., SPÁČ, P. (2017). Slovakia: The Unbearable Lightness of Regionalization. In Schakel, A. H., ed., *Regional and National Elections in Eastern Europe. Territoriality of the Vote in Ten Countries*. London: Palgrave Macmillan, pp. 239-259.

RYBÁŘ, M., SPÁČ, P., VODA, P., NEMČOK, M. (2017). *Po stopách politického zemětřesení: parlamentní volby na Slovensku v roce 2016*. Brno: Centrum pro studium demokracie a kultury.

SCHAKEL, A. H. (2011). Congruence Between Regional and National Elections. Comparative Political Studies, 46(5), 631-662. DOI: 10.1177/0010414011424112.

SCHAKEL, A. H. (2015). Nationalisation of regional elections in Central and Eastern Europe. *East European Politics*, 31(2), 229-247. DOI: 10.1080/21599165.2015.1036034.

SCHAKEL, A. H., DANDOY, R. (2014). Electoral Cycles and Turnout in Multilevel Electoral Systems. *West European Politics*, 37(3), 605-623. DOI: 10.1080/01402382.2014.895526.

SCHIM, M. E., AGNEW, J. (2007). The Geographical Dynamics of Italian Electoral Chance, 1987-2001. *Electoral Studies*, 26(2), 287-302. DOI: 10.1016/j.electstud.2006.05.002.

SCHMITT, H., SANZ, A., BRAUN, D., TEPEROGLOU, E. (2020). It All Happens at Once: Understanding Electoral Behaviour in Second-Order Elections. *Politics and Governance*, 8(1), 6-18. DOI: 10.17645/pag.v8i1.2513.

SCHULZ-HERZENBERG, C. (2019). To vote or not? Testing micro-level theories of voter turnout in South Africa's 2014 general elections. *Politikon*, 46(2), 139-156. DOI: 10.1080/02589346.2019.1595879.

SOLIJONOV, A. (2016). Voter turnout trends around the world. Stockholm: International institute for democracy and electoral assistance.

SPURNÁ, P. (2008). Prostorová autokorelace - všudypřítomný jev při analýze prostorových dat?. Sociologický časopis / Czech Sociological Review, 44(4), 767-788. DOI: 10.13060/00380288.2008.44.4.08.

STATISTICAL OFFICE OF THE SLOVAK REPUBLIC. (2022). Elections and Referenda. Retrieved from: https://volby.statistics.sk/index-en.html. Accessed on 4 November 2022.

VETTER, A. (2015). Just a Matter of Timing? Local Electoral Turnout in Germany in the Context of National and European Parliamentary Elections. *German Politics*. 24(1), 67-84. DOI: 10.1080/09644008.2014.984693.

QUANTIFYING AND VISUALIZING LAND COVER CHANGES: AN ANALYSIS FROM THE HASI REGION (KOSOVO)

Valbon BYTYQI [A]**, Selim QEVANI** [B*]**, Tropikë AGAJ** [C]

A   Geography Department, FMNS, University of Prishtina, 10000 Prishtina, Kosovo
     https://orcid.org/0000-0002-8625-1470, *valbon.bytyqi@uni-pr.edu*

B*   Faculty of Education, University of Prishtina, 10000 Prishtina, Kosovo
     https://orcid.org/0009-0005-5397-4188, *selim.qevani@uni-pr.edu*
     (corresponding author)

C   Poznan University of Life Sciences, Poznan, Poland
     https://orcid.org/0000-0001-8154-7013, *tropike.agaj@up.poznan.pl*

Abstract

Hasi region lies in the southwestern part of Kosovo and is dominated by karstic, ultramafic landscapes in Hasi Mts., and fluvial depositional landforms near White Drini and Erenik Rivers. Karstic landscapes are distinguished by the absence of surface waters and the karstic springs found at the foothills of Pashtrik and Hasi Mts. Broad-leaved forests and transitional woodland-shrubs cover most of middle and high-altitude areas. In the last two decades, the region has experienced landscape transformation resulting in Land Use/Land Cover (LULC) changes, where settlements are extended towards agricultural areas, mainly in lower part of the region. The GIS technique and statistical methods were useful in quantifying, mapping, and visualizing spatiotemporal changes of Land Cover data from Copernicus Land Monitoring Service (CLMS) for 2000-2018, while Sankey diagram is used to visualize the magnitude and the flow of Land Cover Changes in the Hasi region over the last two decades. All the data were analyzed in the ArcMap 10.8 environment. The analysis shows that most of the Land Cover categories have experienced a transformation. From the total area of 30,939 ha, agricultural land decreased by 998 ha, artificial surfaces increased by 293 %, and broad-leaved forest and sparsely vegetated areas experienced an increase. In contrast, transitional woodland-shrubs experienced the most change gaining and losing areas.

Key words
Land Cover Changes, karstic landscape, mapping, landscape change visualization, Hasi region, Kosovo.

INTRODUCTION

Natural processes will have a great influence on Land Cover changes, but human activities are and will be decisive in landscape transformation. Land Use/Land Cover (LULC) consists of different land covers, from single-family residential to large areas of natural environments like forest cover (Treitz and Rogan, 2004), and analysis of them is one of the main contemporary topics of geographical research (Feranec et al., 2016). LULC is related to anthropogenic disturbance, where the distribution of the human population is evident in nearly every part of the Earth, where it shows its presence through natural landscape changes. Land Cover changes show a long interaction between humans and the natural environment (Michaeli et al., 2015), and are the product of different factors and conditions (Solár et al., 2016). Land Cover identifies natural landscapes, which are the product of natural processes like geological, hydrological, ecological, etc., and includes the human-transformed landscape with artificial surfaces. Land Cover change analysis is important for environmental planning and natural resource management (Al-Taei et al., 2023). Estimations show that 17 % of the terrestrial ecosystem has experienced a change at least once between 1960 and 2019 (Winkler et al., 2021). Among other changes, the increase of artificial surfaces on agricultural lands is of high magnitude, introducing human impact. Land cover changes are related to water balance (Bridgewater, 2018). Land Cover changes are occurring around the world. In Europe, 70 Mha of LULC have occurred changes during the period 1992-2015 (Huang et al., 2020), with widespread of urbanization in all regions, especially in central and eastern Europe (Hoffmann et al., 2023), as it is shown by different studies (Cegielska et al., 2018).

Detecting changes in Land Cover in terms of their magnitude and flow, allows plans and projects to interpret correctly spatial planning, regional food security, and environment risk analysis (Doğruer et al., 2023), and for protected areas is important to identify the changes in landscape's structure (Michaeli et al., 2017) and future projections. At the European level, LULC is presented in a unique dataset every 6 years where changes in the landscape can be observed (Feranec et al., 2016), where the territory of Kosovo belongs to it. In recent years, Kosovo, in general, has been losing agricultural land, shifting towards artificial surfaces, where the area per capita is decreasing. Agricultural land conservation is highly important for Kosovo because of its natural conditions with the dominance of hilly-mountainous terrain. Land Cover changes in the Hasi region show the relationship of humans to the environment, but also the succession as a natural process of landscape transformation, as other studies have confirmed, finding human-environment and environment-environment inter-connection (Meyfroidt et al., 2013). According to the studies (Zhang et al., 2023), land cover changes in the karst landscape covered 1.3 million km².

OBJECTIVES

The objectives of the study are to quantify and visualize the Land Cover changes in a fragile region in Kosova, located between White Drini's right alluvial plain and Pashtrik-Hasi karstic terrain, where both landscapes have experienced transformation after extracting sand and gravel and the abandonment of the settlements. Karst terrains have groundwater resources of high importance and biodiversity values, which, with time passing, are becoming vulnerable to human impacts. Land Cover changes have been more emphasized in decreasing agricultural areas while increasing forest and semi-natural areas, and especially artificial surfaces, both in terms of transition from one category to another. In contrast, broad-leaved forests increased, and transitional woodland-shrubs were the category with the most changes experienced in both directions.

THEORETICAL FRAMEWORK

Land Use and Land Cover changes have become the key studies of different scientists with application in the environment, geology, hydrology, and ecology (Weng, 2001), but also in understanding the driving forces of landscape change (Lambin, 1997), which were followed in development of new techniques in tracing Land Use and Land Cover changes. Rapid urbanization has consequences of changes in the local climate, the water cycle, biodiversity loss, and, in general terms, degrades the living environment.

The Hasi region is a mixture of karstic, fluvial, and ultramafic landscapes, indicating socio-economic processes in the region with footprints on the type of living environment. One of the changes in karstic landscape are grassland ecosystems (Bátori et al., 2023), which are interrelated to lithological settings and climate conditions and show a positive relationship in Land Cover change, related to gaining areas in abandoned settlements in study area. Fluvial landforms are attractive for living and are the homes of millions living near them. Nevertheless, as a specific landscape rich in soils and water, it has attracted rapid urbanization, where land cover changes were inevitable (Kayitesi et al., 2022). As studies suggest, Land Cover changes could have an impact on the river's morphology (Kang & Kanniah, 2022), runoff and sediment yield (Munot, Goyal, 2019), surface runoff (Vojtek, Vojtekova, 2019), and flooding will be related as a consequence of hydrologic response (Naha et al., 2021).

Analysis and interpretation, including the consequences of Land Cover changes, are made possible by developing new datasets that various scientists can download and analyze. Land Cover change analysis is made with different focuses. Some authors have analyzed the natural landscape changes in terms of climate change and relation to natural landscapes, with emphasis on biodiversity

loss (Boussema et al., 2023), habitat quality, (Jin et al., 2022), impact in agricultural policy and regional planning (Feranec et al., 2007), and based on future projections, the natural landscape will have the largest effect (Sala et al., 2000).

DATA AND METHODS

To quantify and visualize the Land Cover Changes, data with 100 m spatial resolution of the Hasi region for the years 2000, 2006, and 2018 were downloaded from Copernicus Land Monitoring Service (CLMS) ("CORINE Land Cover"). Data for the year 2012 were not taken into consideration for their reliability, showing similar data in 2018, which, based on our observations, we can conclude that there were changes in the region. Vector (shapefiles) and other raster data were assembled in the ArcMap 10.8 environment. The GIS technique and statistical methods were useful for estimating changes and presenting their spatial-temporal distribution on the study site. Firstly, it enables the categorization of different Land Cover types. Secondly, by using this technique, it enables comparing data and finding temporal changes. Vector and raster data were clipped for the study site and intersected for selected years, and later, the changes were mapped and presented with interesting results. A 10 m DEM was used to estimate slope gradient and altitude classes, while population statistics were downloaded from official censuses for the study area. these data were compared, and changes over the years were presented in thematic maps. ArcMap 10.8 environment has made it possible to quantify and visualize the changes in a thematic map. In contrast, the Land Cover change's magnitude and flow are presented in a diagram where the source and their target destination can be seen (Wang & Feng, 2008).

STUDY AREA

Kosovo is a small country in Balkan Peninsula with diverse physical features. Surrounded by high-altitude mountains in the border zone, inside of them are tectonic plains with high-capability soils. Mountain regions in Kosovo are distinguished by their physical features. Hasi region is located in the southwestern part of Kosovo (Fig 1). According to the regional division of Kosovo, the Hasi region is distinguished by its characteristics, mainly the presence of a karstic landscape and ultramafic rocks topography, where the absence of surface waters is evident. The northern part of the region lies at the foothill of Pashtrik Mt. (1,988 m.a.s.l) and White Drin River (Albanian: Drini i Bardhë) right alluvial plain (Çavolli, 1997).
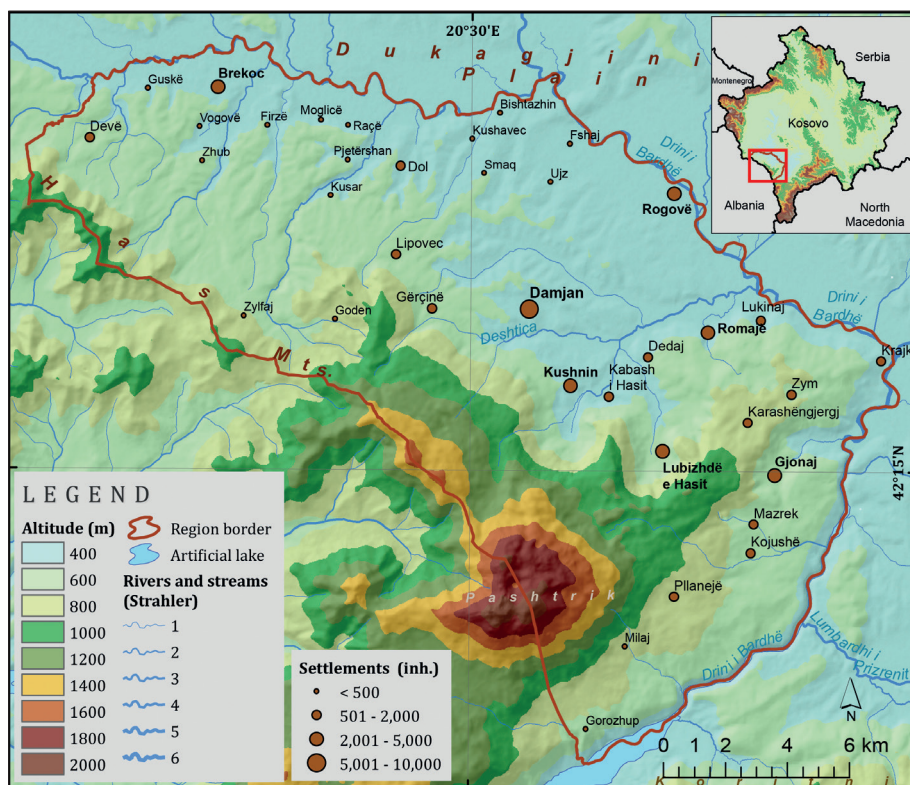
Fig. 1 Location map of the study area
Source: Authors

The Hasi region is located in the Mirdita geological zones (Elezaj, Kodra, 2008; Pruthi, 2013), which stretches in Albania and Kosovo and is marked by the presence of ultramafic rocks, which are located on the western side and are distinguished with the presence of serpentine, gabbro and diabase rocks, while, southern part of regions with the presence of different type of limestones (Fig 2). Both types of rocks have impacted surface and groundwater hydrology, with absence of surface runoff, but with karstic springs at the foothill of the mountain terrain where most of the settlements are located. At the lowest part of the region, which lies in the lowest terrain and near rivers of Drini i Bardhë and Ereniku, loose sediments of fluvial and lacustrine origin are found, which have played an important role in determining their main economic activity. The region's altitude lies between 261 m and the highest peak, Pashtrik – 1,988 m. The average altitude of the whole region is 577 m. The uppermost relief is a typical karst landscape with surface karstic landforms, while the lowest part is a flat one lying on the alluvial plain of Drini i Bardhë and Erenik River (Fig 2).

One of the main terrain features with Land Cover associated is the slope, which has played an important impact in the distribution of agricultural land and settlements. Slopes are classified according to FAO classification (FAO, 2006), while slope category until 2° are only 12.4 % of the region, while slope category between 2-5° are 15.8 % and are considered flat or gently sloping terrain. Between 5-10° are 24 % of slopes, while >10° where terrains are considered sloping, strongly sloping, moderately steep, and steep are dominant covering 71.7 % of the region (Fig 2), which indicates high altitude mountains and rugged terrains of limestones and ultramafic rocks (Table 1).

Tab. 1 Slope categories in the Hasi region according to FAO classification

Slope (degree)	Description	Area (km²)	%
< 2	Flat to very gently sloping	38.39	12.41
2 - 5	Gently sloping	48.97	15.83
5 - 10	Sloping	74.09	23.95
10 - 15	Strongly sloping	55.19	17.84
15 - 30	Moderately steep	83.65	27.04
> 30	Steep	9.10	2.94
	Sum:	309.39	100.00

Source: Calculated by authors
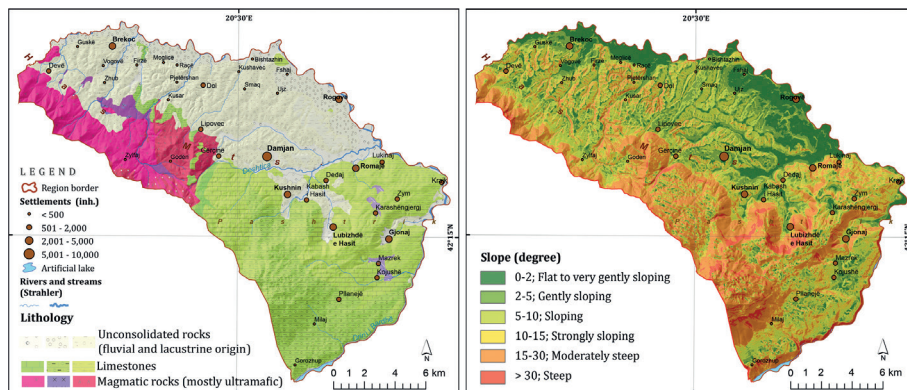
Fig. 2 Lithology (left) and slope map (right) of the study area
Source: Authors

In the lowest altitude, climate conditions are continental under the influence of Mediterranean air masses toward Kosovo, moved along Drini and White Drini Valley into Dukagjini Plain. Altitude plays an important role in the climatic condition of the whole region, while the altitude of Pashtrik Mt. (1,988 m), has indicated

a mountainous climate. The mean annual air temperature in the plain area is between 11-12°C, while the uppermost altitude goes down to 6°C. On the other hand, the mean annual rainfall is between 800 mm in the plain areas and 1,500 mm at the highest altitude of Pashtriku (Pllana, 2013; Pllana, 2015). The Hasi region is considered one of the driest regions with surface waters, where the presence of limestones and ultramafic rocks has indicated such conditions.

There are 37 settlements in the Hasi region in Kosovo, distributed at different altitudes and distances to the main rivers. Because of a karstic landscape, most of the settlements were found in nearby karstic springs. In 1948, the total population number was 13,935 inhabitants, and in the last census, there were 41,642, or an increase of 3 times (Statistical Agency of Kosovo, 2013). The settlement's altitude varies from 316 m (the lowest) to 686 m (the highest). With the increasing population number, most changes happened to artificial surfaces, which showed the highest increase for the analyzed period. In the last years, recreation and tourism have started developing with the possibility of visiting karstic landscapes (caves, natural bridges, springs, potholes), high peaks (Pashtriku, 1,988 m), etc., and the possibilities of future "green corridor" for cross-border tourism between Kosovo and Albania (Ramadani et al., 2020).

RESULTS AND DISCUSSION

Land Cover Change Analysis

Human activities are the main driving force in changing the landscape of specific regions. Based on the characteristics of a region, their scale, magnitude, and target destination of land cover appeared. Land Cover change is one of the main changes that occur during anthropogenic impact. However, in recent years, rapid urbanization has indicated extensive changes with increasing artificial surfaces and a decrease of agricultural land. Socio-economic activities as the main driving force in the landscape have intensified environmental changes altering the landscape and impacting the water cycle and local climate.

Physiographical features of the Hasi region have impacted the distribution of different types of Land Cover, where forest and semi-natural areas are dominant. Based on the Land Cover data for the year 2000, forest and semi-natural areas dominate the region with 64.5 % of the total area (Table 2). Their distribution is correlated with high altitude in the karstic landscape of Pashtrik mountain and other hilly-mountainous areas of the region. Broad-leaved forests are widely distributed forest types, accounting for 43.8 % of the region's total area. They cover enormous areas and represent the highest vegetation zone. Transitional woodland-shrub represents bushy and herbaceous vegetation, covering 14.8 % of the region's total area. Other categories of forests and semi-natural areas were: natural grasslands (2.9 %), sparsely vegetated areas (1.7 %), and others (mixed forests, burnt areas, etc.).

Tab. 2 Land cover classes in the years 2000-2006-2018

Code	Description	2000		2006		2018	
		Area (ha)	%	Area (ha)	%	Area (ha)	%
112	Discontinuous urban fabric	176.8	0.6	515.4	1.7	695.7	2.2
121	Industrial or commercial units	-	-	-	-	1.1	-
211	Non-irrigated arable land	3,117.7	10.1	3,161.9	10.2	2,120.1	6.9
231	Pastures	672.6	2.2	598	1.9	417.8	1.4
242	Complex cultivation patterns	4,559.8	14.7	4,408.0	14.2	4,122.90	13.3
243	Land principally occupied by agriculture, with significant areas of natural vegetation	2,346.7	7.6	2,071.8	6.7	2,559.6	8.3
311	Broad-leaved forest	13,551.0	43.8	13,668.8	44.2	13,870.8	44.8
313	Mixed forest	77	0.2	77	0.2	77	0.2
321	Natural grasslands	890.4	2.9	724.4	2.3	327.7	1.1
323	Sclerophyllous vegetation	0.5	-	0.1	-	0.3	-
324	Transitional woodland-shrub	4,594.4	14.8	4,792.80	15.5	4,723.2	15.3
331	Beaches, dunes, sands	101.7	0.3	-	-	-	-
333	Sparsely vegetated areas	538.8	1.7	528.8	1.7	1,839.8	5.9
334	Burnt areas	214.7	0.7	0	0	86.2	0.3
411	Inland marshes	-	-	295.2	1	-	-
511	Water courses	25.9	0.1	25.9	0.1	25.9	0.1
512	Water bodies	71.7	0.2	71.7	0.2	71.7	0.2
		30,939.7	100	30,939.7	100	30,939.7	100

Source: Copernicus Land Monitoring Service

The second most distributed category of Land Cover is agricultural lands. In 2000, they covered 34.6 % of the region's total area, while complex cultivation patterns (14.7 %) and non-irrigated arable land (10.1 %) were the most extensive type of agricultural land sub-categories. Land principally occupied by agriculture, with significant areas of natural vegetation, covered 7.6 %, and pastures were found in 2.2 % of the region's area. Agricultural lands were found in loose sediments of fluvial and lacustrine origin, in which high-quality soils were created, and played an important portion of the agricultural activity of the population. Artificial surfaces

covered 0.6 % of the total area, while 0.3 % were water courses and water bodies of White Drini and an artificial lake built on it – Vërmica (Fierza) Lake.

Between the years 2000 and 2018, based on natural processes and socio-economic activities, most LULC happened in artificial surfaces (+294 %), forests, and semi-natural areas (+4.8 %), while agricultural areas and wetlands/water bodies had a decrease (-13.8 %, respectively -0.1 %) (Table 3; Figure 3). Firstly, the rapid urbanization of settlements with changes in family structure and migration significantly impacted these changes, while leaving agriculture for another economic activity has detached the population from the land. The presence of inland marshes (wetlands) in the year 2006 is associated with the extraction of sand and gravel from the White Drini floodplain, which degraded the waterway, whereas the process was later considered illegal by the Ministry of Environment.

Tab. 3 Changes over the years in main categories of Land Cover classes

Land Cover Category (ha)	Year			Changes 2000-2018 (%)
	2000	2006	2018	
Artificial surfaces	176.8	515.4	696.8	294.1
Agricultural areas	10,696.7	10,239.8	9,220.4	-13.8
Forest and semi-natural areas	19,968.5	19,791.8	20,924.9	4.8
Wetlands	-	295.2	-	-
Water bodies	97.6	97.6	97.5	-0.1

Source: calculated by authors

Changes in artificial surfaces

All types of artificial surfaces in 2018 experienced an increase compared to the year 2000. Artificial surfaces in the Hasi region appear as discontinuous urban fabric and industrial or commercial units. Discontinuous urban fabric is associated with built-up areas or impervious surfaces. In 2000, there were 176.8 ha or 0.6 % of the total area, but in 2018, they experienced an increase of 293 %, being the class with the most changes during the analyzed timespan. From 2000 to 2018, the discontinuous urban fabric was changed at an annual rate of 28.8 ha. Industrial and commercial units are primarily associated with small enterprises or services, mostly found on two sides of roads. The changes in artificial surface are done with the rapid extension of settlements, changing the style with big houses and yards. The discontinuous urban fabric was shifted towards land principally occupied by agriculture, with significant areas of natural vegetation in 2006 with 270.8 ha and another 56.5 ha, toward complex cultivation pattern (80 ha in 2006 and another 113 ha until 2018), non-irrigated arable land with 4.4 ha in 2006 and another 113 ha until 2018, increasing the total areas of artificial surfaces in 2018 to 696.8 ha.

Changes made towards agricultural land puts in danger regional food security, and the situation becomes worse when comparing the agricultural fund of Kosovo, which has less area per capita than the European level.

Changes in agricultural areas

In the past, agriculture was the main economic activity of Kosovo's population; even the Hasi region wasn't well known for it. The presence of a karstic landscape made nearly impossible the development of agriculture. In the White Drini and Erenik Rivers floodplain, the settlements there could get engaged in agriculture. The analysis for the selected years (2000 and 2018) shows that agricultural land
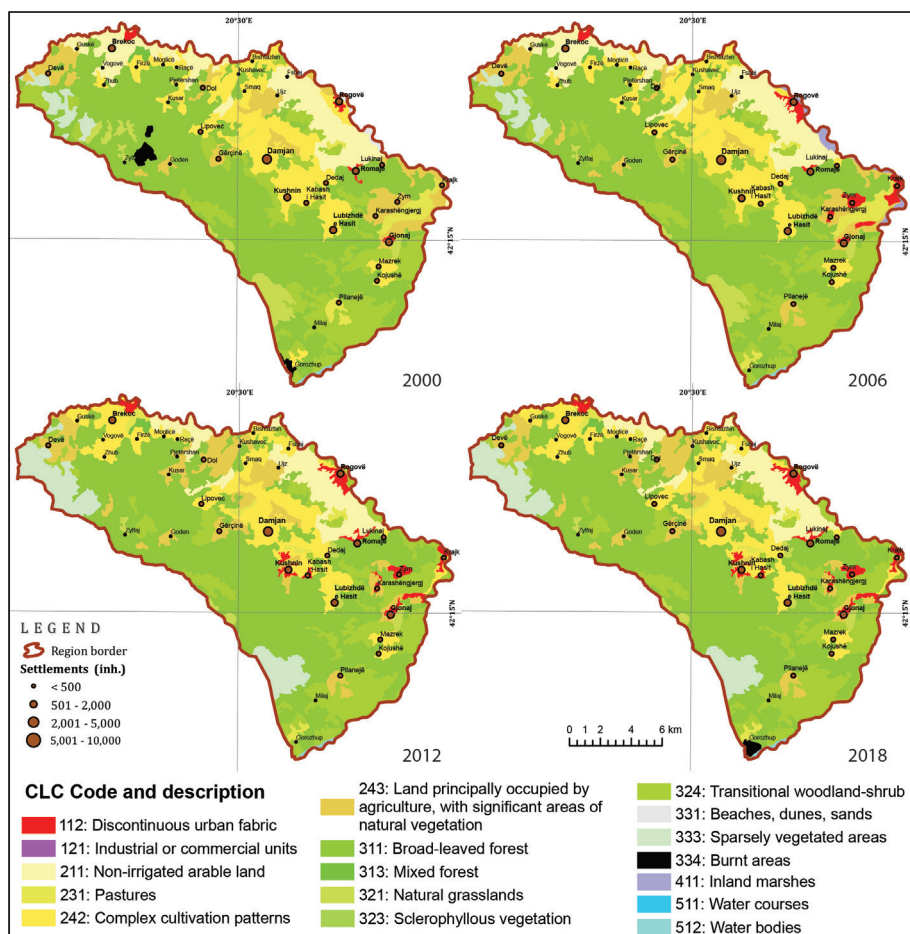
Fig. 3 Mapping changes over the year 2000-2018 in Hasi region
Source: compiled by authors

experienced a decrease of 13.8 %, or in absolute values from 10,696 ha (2000) to 9,220 ha (2018), or an annual change of 82 ha. The flow of changes from agricultural land for 18 years shows different patterns. Changes between 2000 and 2006 were very different. Complex cultivation patterns were shifted towards discontinuous urban fabric (80 ha), non-irrigated arable land (64 ha), and pastures (70 ha). In contrast, land principally occupied by agriculture, with significant areas of natural vegetation, was mostly shifted toward discontinuous urban fabric (270 ha), complex cultivation patterns (63 ha), and non-irrigated arable land (16 ha). However, there was a natural succession, converting them to broad-leaved forests (7 ha) (Fig 3 & 4; Tab 4).

Massive change happened between 2006 and 2018, where complex cultivation pattern changed to discontinuous urban fabric (113 ha), non-irrigated arable land (68 ha), pastures (67), land principally occupied by agriculture, with significant areas of natural vegetation (758), and the others to natural vegetation: broad-leaved forest (60 ha), natural grasslands (113 ha) and transitional woodland-shrubs (75 ha). During the last years, the region has experienced migrations, and the land hasn't been a priority for production.

Land principally occupied by agriculture, with significant areas of natural vegetation, was transformed to discontinuous urban fabric (56 ha), complex cultivation pattern (28 ha), and to other natural vegetation: broad-leaved forest (127 ha), natural grasslands (7 ha), transitional woodland-shrub (265 ha) and sparsely vegetated areas (93) (Fig 3 & 4; Tab 4).

Changes in forests and semi-natural areas

The region is well known for the existence of extensive amounts of forest and semi-natural areas, which are a consequence of natural conditions. In 2000, the area covered by this category was 64.5 % of the region's total area. Most appeared types of forests and semi-natural areas are broad-leaved forests (13,551 ha), transitional woodland-shrub (4,594 ha), natural grasslands (890 ha), sparsely vegetated areas (538 ha), and mixed forest (77 ha). Other categories of semi-natural areas were beaches, dunes, and sands (101 ha), which were a result of sand and gravel extraction from the floodplain of Drini i Bardhë (White Drin River), which resulted from construction works done after the war in Kosovo (1999), and the need for construction materials was immense.

Broad-leaved forests, the most extensive type of forests, and semi-natural areas have experienced changes. During the years 2000-2006, broad-leaved forests were changed to discontinuous urban fabric (0.2 ha), non-irrigated arable land (34 ha), natural grasslands (5 ha), and transitional woodland-shrub (6 ha). As a widespread category, they have gained areas from discontinuous urban fabric (13 ha), natural

Tab. 4 Cross-tabular data of Land Cover changes in the analyzed period

CLC Code / 2000	112	121	211	231	242	243	311	313	321	323	324	331	333	334	511	512	Total
112	157.9		0.1	0.6	2.5	0.0	15.7				0.0						176.8
121																	
211	75.6	1.1	1,929.9	178.1	755.2	54.0	20.2	0.0	0.0		104.1						3,117.7
231	2.0		5.8	85.3	6.7	160.1	1.0				411.9						672.6
242	199.0		110.0	138.0	3,101.5	758.5	59.4	0.0	113.5		80.7		0.0				4,559.8
243	250.4		4.5	0.0	121.1	1,299.1	153.8		7.2		417.4		93.7	0.0		0.0	2,346.7
311	4.1		55.7	0.0	117.0	168.4	12,742.7		24.2	0.0	192.0		221.4	27.6		0.0	13,551.0
313			0.0	0.0	0.0			77.0									77.0
321	0.0		0.0		0.0	46.4	109.9		182.8	0.0	25.2		526.3				890.4
323							0.2		0.0	0.3	0.0		0.0				0.5
324	5.7		14.4	0.0	19.6	70.3	728.1		0.0		3,229.9		486.2	40.9	0.0	0.0	4,594.4
331	1.2		0.0								100.5						101.7
333						3.4	12.9		0.1		10.0		512.5				538.8
334				15.8			29.1				152.3			17.7			214.7
511							0.0				0.0				25.9	0.0	25.9
512							0.0				0.0			0.0		71.7	71.7
Total	695.7	1.1	2,120.1	417.8	4,122.9	2,559.6	13,870.8	77.0	327.7	0.3	4,723.2	0.0	1,839.8	86.2	25.9	71.7	30,939.7

Explanation: 112 - Discontinuous urban fabric; 121 - Industrial and commercial unit; 211 - Non-irrigated arable land; 231 - Pastures; 242 - Complex cultivation patterns; 243 - Land principally occupied by agriculture; with significant areas of natural vegetation; 311 - Broad-leaved forest; 313 - Mixed forest; 321 - Natural grasslands; 323 - Sclerophyllous vegetation; 324 - Transitional woodland-shrub; 331 - Beaches; dunes; sands; 333 - Sparsely vegetated areas; 334 - Burnt areas; 511 - Water courses; 512 - Water bodies

Source: calculated by authors

grasslands (51 ha), sparsely vegetated areas (28 ha), land principally occupied by agriculture (7 ha), and other small areas. Settlements located on the southern slopes of the Pashtrik Mt. were nearly abandoned, and broad-leaved forests were spread there. Between the years 2006 and 2018, broad-leaved forests experienced loss to discontinuous urban fabric (4 ha), non-irrigated arable land (22 ha), complex cultivation patterns (117 ha), land principally occupied by agriculture, with significant areas of natural vegetation (168 ha), natural grasslands (25 ha), transitional woodland-shrubs (187 ha), sparsely vegetated areas (249 ha), and by burning were lost 27 ha (Fig 3 & 4; Tab 4).

Other landscapes transformed into broad-leaved forests between 2006 and 2018, which marked a gain in the category. The gain was made from transitional woodland-shrub (740 ha), land principally occupied by agriculture, with significant areas of natural vegetation (128 ha), complex cultivation patterns (60 ha), transitional woodland-shrub (59 ha), inland marshes (33 ha) natural grasslands (17 ha), sparsely vegetated areas (12 ha) and others in small scale less than 10 ha (Tab. 4).

Natural grassland was another category of forests and semi-natural areas that experienced changes during the analyzed period. Between 2000 and 2006, losses were made towards land principally occupied by agriculture, with significant areas of natural vegetation (50 ha), broad-leaved forest (51 ha), and transitional woodland shrubs (68 ha). However, they gained a small area from broad-leaved forests (5 ha). During the second period of our analysis (2006-2018), changes occurred in both directions regarding gaining and losing. Loses were towards broad-leaved forests (17 ha) and more into sparsely vegetated areas (526 ha). The gain was mostly from complex cultivation patterns (113 ha), broad-leaved forests (25 ha), and land principally occupied by agriculture, with significant areas of natural vegetation (7 ha), a process which shows changes by natural succession.
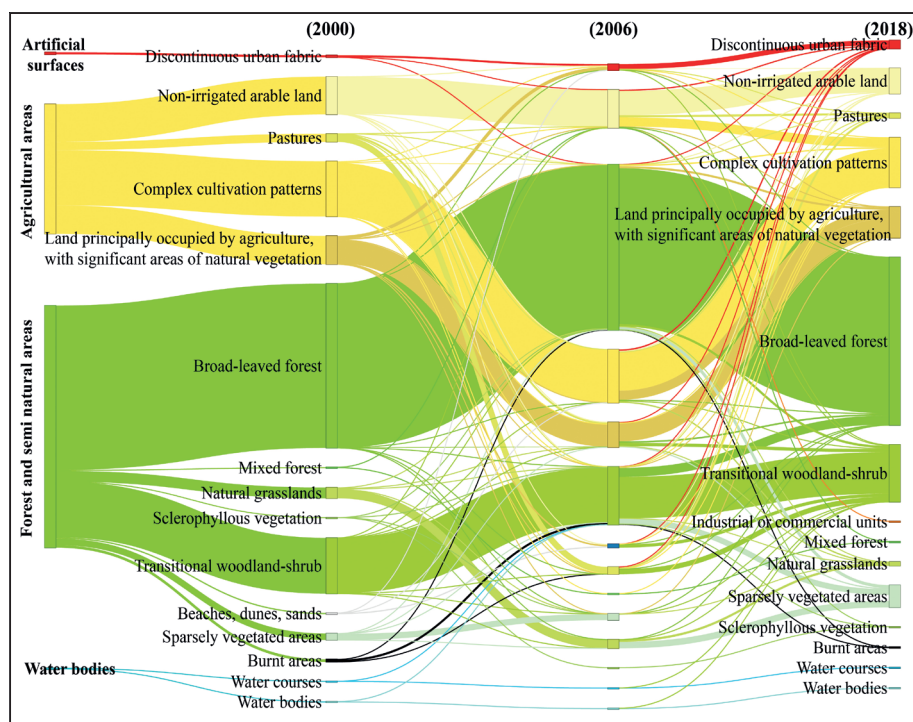
Fig. 4 Land Cover classes magnitude and their flow throughout the years in the Hasi region
Source: compiled by authors

Transitional woodland-shrubs were another category of Land Cover that experienced a transformation by losing or gaining area. Between 2000-2006, losses were found towards broad-leaved forests (33 ha) and sparse vegetation (26 ha), while gains were made from natural grasslands (68 ha) and from burnt areas (170 ha) as part of secondary succession. Between 2006 and 2018, transitional woodland-shrubs were transformed toward discontinuous urban fabric (5 ha), non-irrigated arable land (14 ha), complex cultivation pattern (19 ha), broad-leaved forest (739 ha), sparsely vegetated areas (467 ha) and burnt areas (58 ha). Gaining were made from discontinuous urban fabric (38 ha), non-irrigated arable land (62 ha), pastures (411 ha), complex cultivation pattern (75 ha), land principally occupied by agriculture, with significant areas of natural vegetation (265 ha), broad-leaved forest (187 ha), inland marshes (256 ha) (Fig 4; Tab 4). A main driving force for this landscape transformation is the settlements' future. In the settlements, which experienced an increase in the population where the socio-economic perspective is still alive, changes were made towards discontinuous urban fabric, while in near settlements areas which are experiencing a depopulation, changes were made towards natural landscapes (Fig 3 & 4; Tab 4).

Tab. 5 Changes over the years in main categories of Land Cover classes (%)

Land Cover Category (%)	Year			Changes 2000-2018 (%)
	2000	**2006**	**2018**	
Artificial surfaces	0.6 %	1.7 %	2.3 %	+294.1 %
Agricultural areas	34.6 %	33.1 %	29.8 %	-13.8 %
Forest and semi-natural areas	64.5 %	64.0 %	67.6 %	4.8 %
Wetlands	0.0 %	1.0 %	0.0 %	-
Water bodies	0.3 %	0.3 %	0.3 %	-0.1 %

Source: calculated by authors

Throughout the years, in the floodplains of White Drini and Erenik rivers, were created inland marshes as a specific category of Corine Land Cover, initiated by human activities in terms of sand and gravel extraction, which resulted in river bed and bank erosion, with high environmental impact. The extraction was made firstly after the war in Kosovo (1999) as construction material, and later the consequences were evident, mostly in flood with material damages. Due to big changes in floodplains, sand and gravel extraction was prohibited (Law No. 04/L-147 on Waters of Kosovo, 2013), in which the ecological stability of rivers could be preserved.
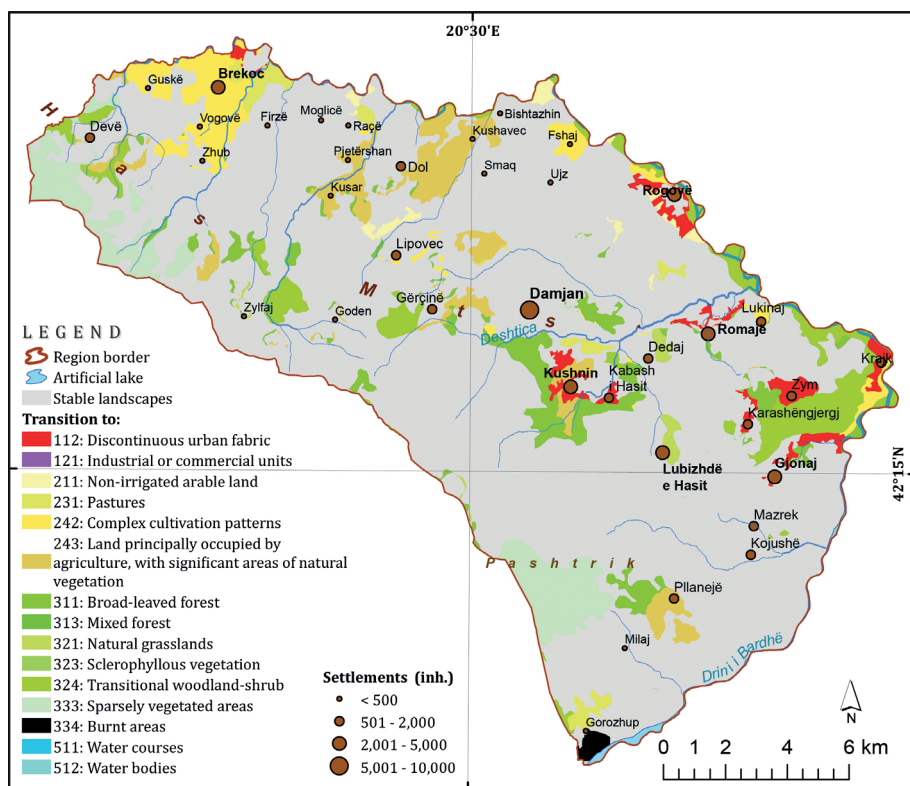
Fig. 5 Transition map of Land Cover changes from the year 2000 to 2018
Source: compiled by authors

CONCLUSIONS

Landscape transformations are changes that appear in all regions around the world. Their magnitude and flow show human activities towards landscapes, but also the development of natural process conditioned by natural factors. The Hasi region is distinguished by its landscape formed in ultramafic rocks, limestone, and loose sediments distinguished by their land cover. In last two decades, human activities as the main driving forces in landscape transformation have changed the land cover, mostly by decreasing agricultural land and shifting towards discontinuous urban fabric resulting from rapid urbanization.

With the GIS approach and statistical methods, it was possible to detect changes in terms of landscape transformation towards natural landscapes and artificial ones. At the same time, the Sankey diagram was used to show the magnitude and flow changes. Mapping the changes indicates the main driving forces in the natural landscape and artificial areas changes over the years, while visualization helped compare the flow of the changes. According to the analysis, artificial surfaces

in Hasi region were increased, mostly shifting towards broad-leaved forests (250 ha), land principally occupied by agriculture (199 ha), pastures (75 ha), etc., while losing 18.9 ha towards broad-leaved forests (15.7 ha), complex cultivation pattern (2.5 ha), etc. Gaining the new areas was made by rapid urbanization in settlements with better perspective while losing was done towards abandoned ones. Changes are occurring mostly in horizontal way built-up areas extension, where zoning maps are not applied. Agricultural land covered 34.6 % of the total area in 2000, which was mostly located in the northern part of the region, in the floodplain of White Drini and Erenik river. The region is well known for its karstic landscape, which indicated main economic activities of the population. In the last two decades, changes also happened to agricultural land, mostly decreasing their areas, and now they cover 29.8 %. Small areas were transformed into agricultural land, primarily from transitional woodland-shrubs. However, the reduction of their areas was towards discontinuous urban fabric. Forests and semi-natural areas have changed too, which is sometimes seen as a process of natural succession. Sparsely vegetated areas and broad-leaved forests were the most gaining area type. At the same time, transitional woodland-shrubs were the category that experienced a transition towards gaining and losing to other categories.

The study reveals that population is the main driving force in changing the landscapes in low areas where most of the settlements are located, where changes were made towards agricultural land, while, in settlements without perspective, changes were going towards natural landscapes.

REFERENCES

AL-TAEI, A.I., ALESHEIKH, A.A., BOLOORANI, A.D. (2023). Land Use/Land Cover Change Analysis Using Multi-Temporal Remote Sensing Data: A Case Study of Tigris and Euphrates Rivers Basin. *Land*, 12(5), pp. 1101–1101. https://doi.org/10.3390/land12051101.

BÁTORI, Z., VALKÓ, O., VOJTKÓ, A., TÖLGYESI, C., FARKAS, T., FREI, K., HÁBENCZYUS, A.A., TÓTH, Á., LI, G., RÁDAI, Z., DULAI, S., BARTA, K., ERDŐS, L., DEÁK, B. (2023). Environmental heterogeneity increases the conservation value of small natural features in karst landscapes. *Science of The Total Environment*, 872, pp. 162120–162120. https://doi.org/10.1016/j.scitotenv.2023.162120.

BOUSSEMA, S.B.F., ALLOUCHE, F.K., AJMI, R., CHAABANE, B., GAD, A.-A. (2023). Assessing and monitoring the effects of land cover changes in biodiversity. Case study: Mediterranean coastal region, Sousse, Tunisia. *The Egyptian Journal of Remote Sensing and Space Science*, 26(1), pp. 185–196. https://doi.org/10.1016/j.ejrs.2023.01.002.

BRIDGEWATER, P. (2018). OBSOLETE: Hydrology in the Anthropocene. Elsevier eBooks. https://doi.org/10.1016/b978-0-12-409548-9.09916-4.

CEGIELSKA, K., NOSZCZYK, T., KUKULSKA, A., SZYLAR, M., HERNIK, J., DIXON-GOUGH, R., JOMBACH, S., VALÁNSZKI, I., FILEPNÉ KOVÁCS, K. (2018). Land use and land cover changes in post-socialist countries: Some observations from Hungary and Poland. *Land Use Policy*, 78, pp. 1–18. https://doi.org/10.1016/j.landusepol.2018.06.017.

ÇAVOLLI, R. (1997). *Regional Geography of Kosovo*. Prishtina: UP.

STATISTICAL AGENCY OF KOSOVO. (2013). Census, Households and Housing in Kosovo 2011: The Final Results: Key Data. Prishtina, pp. 1–77.

DOĞRUER, M.K., KAHRAMAN, M., DOĞAN, M., YEGINBAYEVA, A.Y. (2023). Spatial variation of agricultural land in Turkey using CORINE data. *Journal of the Bulgarian Geographical Society*, 49, pp. 89–99. https://doi.org/10.3897/jbgs.e113364.

ELEZAJ, Z. AND KODRA, A. (2008). *Geology of Kosovo*. Prishtina: UP.

FERANEC, J., SOUKUP, T., HAZEU, G.W., JAFFRAIN, G. (2016). European Landscape Dynamics. CRC Press eBooks, Boca Raton, pp. 1–367. https://doi.org/10.1201/9781315372860.

FERANEC, J., HAZEU, G., CHRISTENSEN, S., JAFFRAIN, G. (2007). Corine land cover change detection in Europe (case studies of the Netherlands and Slovakia). *Land Use Policy*, 24(1), pp. 234–247. https://doi.org/10.1016/j.landusepol.2006.02.002.

HOFFMANN, P., REINHART, V., RECHID, D., de NOBLET-DUCOUDRÉ, N., DAVIN, E.L., ASMUS, C., BECHTEL, B., BÖHNER, J., KATRAGKOU, E., LUYSSAERT, S. (2023). High-resolution land use and land cover dataset for regional climate modelling: historical and future changes in Europe. *Earth System Science Data*, 15(8), pp. 3819–3852. https://doi.org/10.5194/essd-15-3819-2023.

HUANG, B., HU, X., FUGLSTAD, G., ZHOU, X., ZHAO, W. and CHERUBINI, F. (2020). Predominant regional biophysical cooling from recent land cover changes in Europe. *Nature Communications*, 11(1). https://doi.org/10.1038/s41467-020-14890-0.

JAHN, R. (2006). *Guidelines for soil description*. 4th ed. Rome: FAO, pp. 1–97.

JIN, S., LIU, X., YANG, J., LV, J., GU, Y., YAN, J., YUAN, R., SHI, Y. (2022). Spatial-temporal changes of land use/cover change and habitat quality in Sanjiang plain from 1985 to 2017. *Frontiers in Environmental Science*, 10. https://doi.org/10.3389/fenvs.2022.1032584.

KANG, C.S., KANNIAH, K.D. (2022). Land use and land cover change and its impact on river morphology in Johor River Basin, Malaysia. *Journal of Hydrology: Regional Studies*, 41, p.101072. https://doi.org/10.1016/j.ejrh.2022.101072.

KAYITESI, N.M., GUZHA, A.C., MARIETHOZ, G. (2022). Impacts of land use land cover change and climate change on river hydro-morphology- a review of research studies in tropical regions. *Journal of Hydrology*, 615, p.128702. https://doi.org/10.1016/j.jhydrol.2022.128702.

LAMBIN, E.F. (1997). Modelling and monitoring land-cover change processes in tropical regions. *Progress in Physical Geography: Earth and Environment*, 21(3), pp. 375–393. https://doi.org/10.1177/030913339702100303.

land.copernicus.eu. (n.d.). *CORINE Land Cover*. [online] Available at: https://land.copernicus.eu/en/products/corine-land-cover.

Law No. 04/L-147 On Waters of Kosovo.

MASNÝ, M., BALÁŽOVIČOVÁ, L., ŠOLTÉS, M. (2023). Land cover changes over the past 30 years in the Demänovka river catchment. *Geografický časopis*, 75(3), pp. 235–252. https://doi.org/10.31577/geogrcas.2023.75.3.12.

MEYFROIDT, P., LAMBIN, E.F., ERB, K.H., HERTEL, T.W. (2013). Globalization of land use: distant drivers of land change and geographic displacement of land use. *Current Opinion in Environmental Sustainability*, 5(5), pp. 438–444. https://doi.org/10.1016/j.cosust.2013.04.003

MICHAELI, E., SOLÁR V., IVANOVÁ M. (2017). The Landscape Structure of National Nature Reserve Sivá Brada in Years 1877, 1957, 2015 and its Current Status from the Aspect of Nature Protection, *Folia Geographica*, 59/2, pp. 5-17.

MICHAELI, E., IVANOVÁ, M., SOLÁR, V., UHAŠČÍKOVÁ J. (2015). Change in Functional the Landscape Structure in Time Horizon 1822-2012 in the Rural Settlement of Jakubany. *Folia Geographica* 2015, 57/2, pp. 61-74.

MUNOTH, P., GOYAL, R. (2019). Impacts of land use land cover change on runoff and sediment yield of Upper Tapi River Sub-Basin, India. *International Journal of River Basin Management*, pp. 1–13. https://doi.org/10.1080/15715124.2019.1613413.

NAHA, S., RICO-RAMIREZ, M.A., ROSOLEM, R. (2021). Quantifying the impacts of land cover change on hydrological responses in the Mahanadi River basin in India. 25(12), pp. 6339–6357. https://doi.org/10.5194/hess-25-6339-2021.

PLLANA, R. (2013). The climate of Kosovo. In: R. Ismajli and M. Kraja, eds., *Kosovo: A monographic survey*. Prishtina, Kosovo: Kosovo Academy of Sciences and Arts, pp. 50–56.

PLLANA, R. (2015). *The climate of Kosovo*. Prishtinë: ASHAK, pp. 1–321.

PRUTHI, V. (2013). Geological features of Kosovo. In: R. Ismajli and M. Kraja, eds., *Kosovo: A monographic survey*. Prishtina: Kosovo Academy of Sciences and Arts, pp. 28–34.

RAMADANI, I., DIBRANI, E., HOTI, D., GASHI, F. (2020). Opportunities for the development of cross-border tourism in South-East Europe: The case of Kosovo-Albania border. *European Journal of Geography*, 11(3), pp. 43–55. https://doi.org/10.48088/ejg.i.ram.11.3.43.55.

SALA, O.E. (2000). Global Biodiversity Scenarios for the Year 2100. *Science*, 287(5459), pp. 1770–1774. https://doi.org/10.1126/science.287.5459.1770.

SOLÁR V., MICHAELI E., IVANOVÁ M. (2016). Changes in the Structure of the Landscape after 1948 in Poprad Basin. *Folia Geographica* 58/2, pp. 81-92.

TREITZ, P., ROGAN, J. (2004). Remote sensing for mapping and monitoring land-cover and land-use change - an introduction. *Progress in Planning*, 61(4), pp. 269–279. https://doi.org/10.1016/s0305-9006(03)00064-3.

VOJTEK, M., VOJTEKOVA, J. (2019). Land Use Change and its impact on surface runoff from small basins: a case of Radiša basin. *Folia Geographica*, 61(2), pp. 104–125.

WANG, Y.C., FENG, C. (2008). Visualizing research of land use land cover change. *Proceedings of SPIE*. https://doi.org/10.1117/12.812709 .

WENG, Q. (2001). A Remote Sensing-GIS evaluation of urban expansion and its impact on surface temperature in the Zhujiang Delta, China. *International Journal of Remote Sensing*, 22(10), pp. 1999–2014. https://doi.org/10.1080/713860788.

WINKLER, K., FUCHS, R., ROUNSEVELL, M., HEROLD, M. (2021). Global land use changes are four times greater than previously estimated. *Nature Communications*, [online] 12(1), p.2501. https://doi.org/10.1038/s41467-021-22702-2.

ZHANG, J., LIESCH, T., CHEN, Z., GOLDSCHEIDER, N. (2023). Global analysis of land-use changes in karst areas and the implications for water resources. *Hydrogeology Journal*, 31(5), pp. 1197–1208. https://doi.org/10.1007/s10040-023-02650-5.

THE TRIADIC NEXUS: UNDERSTANDING THE INTERPLAY AND SEMANTIC BOUNDARIES BETWEEN PLACE IDENTITY, PLACE IMAGE, AND PLACE REPUTATION

Kvetoslava MATLOVIČOVA [A*]

A*   Faculty of Commerce, Department of Tourism, University of Economics,
     Dolnozemská cesta 1, 852 35 Bratislava, Slovakia,
     https://orcid.org/0000-0001-9635-4177, *kvetoslava.matlovicova@euba.sk*
     (corresponding author)

Abstract

This study seeks to explore the nature of the interconnections and semantic boundaries between place identity, place image and place reputation. The examination of the relationships between these concepts was based on a meta-synthesis of 153 predominantly empirical studies, most of which examined these concepts individually. The research revealed that the delineation of place identity, place image and place reputation varies considerably depending on the perspective chosen by the authors, which can lead to confusion in the study and especially in the interpretation of the results. In this study, place image is considered as a subjective reflection of an objectively defined identity. In other words, image is the perception of identity, its reflection in the individual's consciousness, encompassing both cognitive and evaluative dimensions. Place identity is understood as a set of elements and attributes that characterise and differentiate a given territory from others. Place reputation represents the highest level of generalisation of territorial perception. It is "formed" as a consensual evaluation by external audiences into a collectively accepted dichotomous assessment: "good" or "bad" reputation. The common and differentiating attributes are compared in a summary table. The study provides a basic theoretical framework of the concepts of place identity, image and reputation applicable to place branding and place marketing and management strategies aimed at enhancing the attractiveness of a place to potential target segments.

Key words

Place identity, place image, place reputation, place branding, perception.

INTRODUCTION

The identity, image, and reputation of a place (cities, regions, countries, or other administrative units) represent three closely interconnected concepts. They are intrinsic components of place branding. A systematic and purposeful approach

to place branding typically enhances the attractiveness of a place for residents, tourists, and investors, and has a positive impact on its overall development and quality of life.

Unlike corporate branding, place branding relies on the cooperation of numerous stakeholders, including representatives of governments and local and regional authorities, the business sector, and various other unspecified stakeholders, and last but not least local residents. The extent to which these actors recognise the importance of identity, image, and reputation for the competitiveness of the place they collectively aim to develop will significantly influence the amount of effort and financial resources invested, and also on the speed and likelihood of achieving their goals. In other words, understanding the importance of place branding and actively managing it can substantially contribute to economic growth and the creation of attractive, prosperous places, and to improving the quality of life within them.

OBJECTIVES AND METHODS

In this context, our primary objective is to elucidate the nature of the interconnection and semantic boundaries of the concepts of identity, image, and reputation. The examination of the interrelationships between these concepts was based on 153 mostly empirical studies, the overwhelming majority of which examined them individually. Based on the consequent meta-synthesis, the paper aim is to provide a theoretical framework applicable to place branding strategies, as well as the place marketing and management. We will focus on the nuances of the interplay and the differences in the specific attributes that define these concepts. This understanding is deemed crucial for effective place management, particularly for branding, which must be based on a profound comprehension of the place's identity and its significant differentiating attributes. Place identity attributes are used strategically to achieve a desirable place image and positive place reputation through coordinated and consistent communication.

RESULTS

Place Identity

Place identity encompasses a collection of elements and attributes that define a particular place and its associated community, distinguishing it from other places. The concept is best elucidated when juxtaposed with the notion of place image. Identity, possessing an inherently objective nature, is considered to be given. Conversely, image represents the perception of identity, reflecting it in individual consciousness and encompassing both cognitive and evaluative dimensions (Matlovičová 2015). Thus, image is understood as the subjective interpretation of an (objectively) established identity (Govers, Go 2009; Zenker 2011). The formation

of an image presupposes an individual's primary or secondary experience of identity. Nevertheless, identity is not static, especially from a social constructivist standpoint. Places are perceived as dynamic social constructs, continually being created and re-created, thereby perpetually emerging and dissolving. Consequently, they can be conceptualised as spatial delineations of social relations (Chromý et al. 2014).

When conceptualizing a place as a region, Paasi (2002) posits that the social process of space formation can be understood on three interrelated levels: territorial, symbolic, and institutional. These levels interconnect and collectively form a unique and distinguishable whole (Chromý et al. 2014). The ensemble of these dynamic elements enables individuals to differentiate one place from another, thereby constituting place identity. The instability and variability of identity elements over time - due to environmental, political, economic, and technological changes - suggests that if these elements are no longer perceived by people, the region effectively ceases to exist (Chromý et al. 2014; Siwek 2011; Matlovičová 2015).

Place identity is intrinsically linked to the individuals who embody it and cannot be understood in isolation from the social context in which it is produced (Cowan, Steward 2007; Skandalis et al. 2017; Rodrigues et al. 2020). The structuralist model of place identification, as referred to by Scott et al. (1998) and based on Giddens' structuralist framework (1984), supports the duality of identity and identification. This duality encompasses strong attachment and belonging to a particular place, but also a distinction between "us" and "them". Identification with a place, defined as the emotional need for group acceptance, is thus seen as a fundamental component of place identity (Matlovičová 2015).

The process of self-identification and belonging to a place encompasses topophilia and the concepts of place attachment and place identity (Matlovičová, 2015). Aitken and Campelo (2011) clarify that although these terms are interrelated in the context of place marketing, they are distinct phenomena. The main difference is that place attachment pertains to the individual, whereas place identity is a collective phenomenon associated with shared identity and culture.

Identification with a place, particularly the deliberate distinction and emphasis of differences based on associated identities, plays a crucial role in the creation and shaping of a place brand (Matlovičová, 2015).

Place identity can be precisely defined as *"the process through which people, through interactions with places, identify themselves in terms of belonging to a specific place"* (Florek 2011). Its intergenerational reproduction is driven by the need of group/local community members to belong somewhere. Place identity is also understood as a social construct within a socio-cultural environment and involves the recognition of similarities and differences between places (Tóth 2023). This is communicated through both tangible and intangible elements of the place, such

as infrastructure and culture (Mueller, Schade 2012; Relph 1976; Szűcs, Koncz 2020). From the perspective of place marketing and branding, it is practical to view place identity as a complex of elements and characteristics that are unique to the place, and provide it with specific advantages over other competitive places (e.g., Anholt 2007; Dinnie 2008; Michalková 2014). However, it is important to acknowledge that this complex is not fixed but fluid and evolves on the basis of experience (Matlovičová, 2015).

The essential characteristics of place identity can be summarised as follows:

Place identity is socially conditioned - The bearers of place identity are the residents, who possess a conception of their identity as a place, including what or whom they embody. Consequently, a place brand strategy that diverges from the inherent identity of the place is likely to be perceived as inauthentic and rejected by locals, and is also unlikely to be accepted by external audiences (Hall 2008). Hague (2005) describes the understanding of the environment from a spatial planning perspective as a process of filtering emotions, meanings, experiences, memories, and activities through social structures. Furthermore, the process of making sense of a place is influenced by the environment, individual perceptions, and the specific social worlds of each person (Wynveen et al. 2012). Therefore, the core of place identity is fundamentally socially conditioned (Matlovičová 2015).

Place identity is pluralistic - Plurality of identity has been well documented in business, organizational (e.g., Balmer, Greyser 2003; Cillia et al. 1999), personal (e.g, Barker, Galasinski 2001) and place (e.g, Baxter et al. 2013) literature. For instance, de Cillia et al. (1999) assert that "*there is no such thing as a single and exclusive national identity.*" Multiple identities emerge as a result of various evaluations of the place, spanning a spectrum from favourable to unfavourable (Hall 2003). The uniqueness of a place is subjective and varies for each person who lives in or interacts with it, based on their individual experiences (Hall 2003; Baxter et al. 2013; Matlovičová 2015). From a marketing or branding strategy perspective, it is crucial to consider the interactions among existing identities. These identities may complement, contradict, or even oppose each other, including in relation to pre-existing place strategies (Baxter et al. 2013; Matlovičová 2015).

Place identity is fluid - Altman and Low (1992) conceptualize places as repositories of contexts within which interpersonal, community, and cultural relationships emerge, which are inherently dynamic rather than static (Su, Huang, Hsu 2018). This conceptualisation leads to an understanding of identity as a social and relational construct, emphasising its dynamic nature. The attributes constituting identity are in a constant state of flux. The fluidity of place identities indicates that they represent an ongoing developmental process rather than a final outcome. Consequently, multiple identities emerge from a continuous process of meaning-making between individuals and the place they inhabit (Morgan, Pritchard, Pride 2011). From a perspective of spatial planning, it is important to

continuously monitor the sources that contribute to identity, both within and outside the place (Matlovičová 2015).

Place identity is co-created - The existence of place, as distinct from space, is contingent upon human interaction. The co-production of place identity therefore involves the creation of meaning through the relationship between residents and the place. From a marketing perspective, this implies that residents act as both co-producers and consumers of place identity (Morgan, Pritchard, Pride 2011). Place identities reflect how individuals interpret elements of the place, such as its culture and physical environment (both natural and anthropogenic; Money, Hillenbrand 2006). These identities are formed through interactive processes between the place and its inhabitants, as well as among the inhabitants themselves. Place identities are co-created to the same extent as the physical appearance of a city or landscape, through experience, observation (eyes), reflection (mind) and the observer's intention (purpose; Relph 1976; Proshansky 1978; Hernández et al. 2007; Matlovičová 2015).

Place identity is layered - This characteristic aligns with the delineation of place as part of a scalar hierarchy (Matlovičová, 2015). Spatial identities frequently correspond to the administrative hierarchy, although individual levels can sometimes overlap, contradict, or complement each other - both in terms of the spaces these "places" occupy and the contexts in which they are deemed significant by the public. Consequently, individual levels bind identities that are selectively layered at different scales (Boisen et al. 2011). The challenge lies in understanding the identity of "non-standard" regions created recently and lack historically established identities (Terlouw 2009). These regions often represent new forms of spatial identity, that are less defined by administrative hierarchies, and are created with specific intentions (e.g., new forms of intercity or interregional cooperation), that aim to establish an additional layer of identity across existing or entrenched ones (Boisen et al. 2011). Cross-sectional research on identities in non-standard places led Terlouw (2009) to theoretically conceptualise the layering of identities in such regions. According to Terlouw (2009), it is possible to assess place identities based on their robustness, ranging from "robust" (old, entrenched, and more stable) to "thin" (new, less stable, and less entrenched). From a branding perspective, examining the layering of place identities is utilized in the "artificial" creation of new regions to advance their functional, often economic, objectives (Terlouw 2009). Terlouw further notes that, in the process of layering, new entities frequently build their spatial identity by adopting existing, older place identities. This can involve copying the identity of neighbouring places or transferring it between hierarchical levels - either narrowing or expanding it. Horizontal transfer refers to identity transfer between neighbouring places, while vertical transfer pertains to identity transfer between different hierarchical levels. Downward transfer, from a higher to a lower level, is known as identity narrowing, while upward transfer, from a lower

to a higher level, is termed identity expansion (Terlouw 2009). This highlights that identification with places is highly contextual, particularly when considering new, less traditional, or "weak" spatial identities (Boisen et al. 2011; Terlouw 2009). The layering of place identities facilitates the emergence of new "places". Without such layering, places would remain unchanged in the perception of their target audiences. The acceptance of a new meaning for a place signifies the emergence of a new identity (Boisen et al. 2011). The belief in the ability to influence this process creates opportunities for the development of place branding (Matlovičová 2015).

Place Image

The creation of a desirable place image has become a common practice worldwide, stemming from the ongoing efforts of territorial managers to attract investors, tourists and new residents. The growing interest in the concept of place image has led to numerous attempts to establish a foundational framework that aims to provide a comprehensive theoretical basis for practical application.

Different approaches vary according to their objectives. According to Smith (2005), place image can be approached as a form of communication (e.g., Burgess, Wood 1988), a means of social control (e.g., Debord 1994; Smith 2005), a form of urban management (e.g., Stoker, Mossberger 1994; Smith 2005), an expression (e.g., Philo, Kearns 1993) or a marketing method (e.g., Fretter 1993). In practice, these approaches are often combined and intertwined. Most attempts to conceptualise and differentiate existing approaches are based on identifying the more or less dominant attribute in their understanding (Matlovičová 2015).

The Perceptual Approach to Place Image

As we have noted in earlier work (e.g. Matlovičová 2015, Matlovičová et al. 2019), among the most prevalent approaches to understanding place image are the perceptual approaches, grounded in the principles of Gestalt psychology or environmental psychology (e.g., Ashworth, Voogd 1990). Gestalt theory interprets place perception as a holistic process, positing that individuals tend to perceive the overall image rather than its individual features (e.g. Mayo, Jarvis 1981; McCleary 1999; Papadopoulos, Heslop 2002, Zenker, Braun 2010, Kavaratzis, Hatch 2013, Cheng, Zhang 2021). Thus, the entirety surpasses the combined value of its individual components (Matlovičová 2015). This statement is supported by Cheng, Zhang (2021), who argue that place image is the cumulative result of people's experiences, beliefs, feelings, knowledge, and impressions about a place that exist as mental representations in their minds. It encompasses the overall perceptions that individuals hold, including their beliefs and ideas about the place. A place is a complex and evolving spatio-temporal phenomenon, with symbols and impressions continually changing. This mechanism elucidates how we manage

the diverse and extensive array of landscape appearances and visual schemas. Principles of Gestalt psychology are employed to uncover how individuals organise, logically reason, and model information about places, thereby creating a meaningful image (Downs, Stea 1973, Mayo, Jarvis 1981, Gartner 1993, Baloglu, McCleary 1999, Kappraff 2002, Matlovičová 2015). These principles were already described in the early 1960s by Lynch (1960). Lynch's seminal work on urban design and the image of the city is based on the principles of Gestalt psychology, emphasising how people perceive the city as a whole (discussed in more detail below). Later, e.g. Downs and Stea (1973), Nasar (1992), or even Kappraff (2002) discuss how Gestalt principles are applied to the perception of the spatial aesthetics of the urban environment and shaping place images from a holistic perspective. Other approaches and techniques have been indirectly inspired by environmental psychology through behavioural geography (Tuan 1975, Gould, White 1986, Golledge, Stimson 1997, Kitchin 1994, Smith 2005). Downs, Stea (1973) and Kitchin (1994) discuss the concept of cognitive mapping and mental maps, which are fundamental to understanding how people perceive place images through the lens of environmental psychology and behavioural geography. In addition to mental maps, choice sets, and various other techniques are also used when examining quantitative data. These methods have proven highly useful for understanding the effects of place image based on physical visits to a place (primary image; e.g. Merrilees et al. 2016; Kavaratzis et al. 2017; Zenker et al. 2017; Kalandides 2018). Their use is less justified for exploring a place image formed without direct experience, relying solely on mediated information about the place (secondary image; Smith 2005).

These approaches are often criticised for being overly influenced by environmental behaviourism and for underestimating the impact of cultural factors (Greiner 2016; Smith 2005; Rausell-Köster et al. 2022). For instance, Shields (1991) argues that when perceptualists study place imagery, they are simply recording memories of individual scenes. Furthermore, while perceptual research emphasises the subjective nature of place symbolism, such research is limited by the generalisation of the "*individual inner world into a socially closed system of shared meanings*" (Shields 1991; Smith 2005). These are the main arguments for criticising an over-concentration on environmental behaviourism. Greiner (2016), Smith (2005) and Rausell-Köster et al. (2022) therefore highlight the importance and need to consider cultural factors in particular in the development of cities and the shaping of place image. Another challenge in examining place image from a place branding perspective is the excessive emphasis on its static structure, neglecting its dynamic nature (Gospodini 2016; Kavaratzis 2017). Such a perspective likely reflects a highly simplified understanding of the process as communication between the source of information (message milieu) and the recipient (Matlovičová 2015).

The Processual Approach to Place Image

According to the processual perspective perspective, place image can be conceptualised as a communication process involving the gradual and continuous transmission of information between the source, referred to as the message milieu, and the recipient (Matlovičová 2015). The message milieu, recipients, and communication channels, along with the content of the messages, are considered key elements of the entire communication system (Lasswell 1948). This approach assumes that the place image can be shaped through the deliberate influence of the message milieu (Smith 2005). Common marketing communication tools are utilised in this process. The process of information transfer does not end at the moment of information delivery. After processing the information, the recipient becomes its bearer and disseminator, and thus a part of the information milieu (Matlovičová 2015). However, the content of the disseminated information remains a question, as the process of retransmission (reception by the recipient, processing, and broadcasting of the processed information) modifies the original set of informational messages derived from the place identity (Matlovičová 2015).

In this context Ashworth and Voogd (1990) propose that communication methods act as a link between an individual's perception of a place and the desired image that the place aims to project. Anholt (2010) further adds that the process of place image creation involves conveying the identity of a place to the public, taking into account that some aspects may be lost or altered due to communication noise and individual or external influences. Although this model has potential as an analytical tool, it is crucial to note that it relies on a significantly simplified concept that separates the sender from the recipient and it overlooks many symbolic attributes of the place that cannot be consciously planned for, as well as those whose reception is uncontrollable (Anholt 2010).

Perceptual-Processual Approach to Place Image

This approach introduces further variations of the processual understanding of place images, enhanced by elements of the perceptual approach: place image as a reduced form of reality, and place image as a modified supplement to reality (Matlovičová 2015).

a) *The effect of narrowing reality in the creation of place images*: In this context, the place image can be conceptualised as a mental reflection in the mind of an individual, formed by a set of selected feelings and information associated with the place. However, it is not a process of passive reception of information or perceptions, nor is it a mechanical reduction of complex reality, but a cognitive process wherein selected attributes of the place undergo further processing (e.g. Stea 2017; McCunn, Gifford 2017). The human brain cannot perceive all

stimuli with equal intensity; it reacts more sensitively to certain stimuli while being resistant to others (Gardini el al. 2009). Each individual extracts only certain information and feelings from the informational environment, which Reynolds (1965) refers to as the "message milieu". These extractions result from an active creative process where the individual receives, decodes, and abstracts specific elements of information (Matlovičová 2015). According to Miller (1956), these elements are then transformed into a system of better-organized and more understandable units, or "chunks". Ashworth and Voogd (1990) describe this transformation process as a "radio" analogy. The creation of these better organised units of input stimuli facilitates memorisation and is crucial for easier retrieval in long-term memory (Matlovičová, 2015). The effect of reality narrowing in forming a place image is evidenced by the reduction of the transmitted information set from the "message milieu", influenced by a set of internal factors related to the recipient (Matlovičová 2015). These elements create specific filters through which we interpret reality. Therefore, the image of the territory often has a decisive influence on the selection processes of the territory (e.g. in the decision-making of investors, tourists, residents). Thus, we can conclude that the correction of reality perception in line with an already formed image can lead to the reality narrowing effect (Matlovičová 2015). In this scenario, the individual disregards those parts of the transmitted informational messages that contradict the preformed image (Johnova et al., 2007). Here, the place image is influenced by the favourable or unfavourable bias of the recipient or the sender of information regarding the place's attributes (Parenteau 1995).

b) *The effect of reality expansion in place Image creation*: The image, or specific perception of an object (a place) is not formed solely based on its present real nature. Instead, the current reflection in our mind is transformed into a simplified and personally acceptable form. This transformation process is influenced by our judgement, personal value system, previous experiences, and various external influences (Matlovičová 2015). The multitude of factors involved, and their variability over time, significantly complicates the study of this process, even when considering the perception of relatively simple objects (Matlovičová 2015). The inherent subjectivity and frequent individual distortions of the transmitted information suggest that the place image can be considered as a system of interferences (Matlovičová 2015). However, after the transformation mentioned above, the individually formed images of a place only partially reflect the real picture of the place and are often only indirectly related to it (Gelli et al. 2019; Yanitskiy et al. 2021; Rodriguez et al. 2021). The process of generalising and reshaping reality involves additional factors that not only reduce it, but also "enhance" it (both positively and negatively) with supplementary attributes (Matlovičová 2015). These supplements to reality

are typically stored in memory before an individual encounters the place. Their distinctive feature is that they are "added" to the perceived reality subconsciously, regardless of whether they align with the currently transmitted information (Matlovičová, 2015). Prejudices, for instance, often serve as substitutes for missing information under certain circumstances. In cases of conflict between transmitted stimuli and recalled memories, they can influence the process of selective perception (e.g., Wäckerlin et al. 2019; Manyiwa et al. 2018; Stanowicka 2020). In other words, individuals tend to adapt information according to their pre-formed personal opinions (Matlovičová, 2015). Subsequent cognitive processing, irrespective of the objective reality, tends to reinforce individuals' initial perceptions. Essentially, this illustrates a confirmation bias, wherein individuals perceive information in a manner that aligns with their pre-existing beliefs. Biases can thus lead to the reality-expansion effect, which occurs when a place is ascribed attributes that it no longer really has or attributes that it never had - in a positive or negative sense (e.g. various myths, superstitions, etc.; Matlovičová 2015). In this context, place image can be perceived as a set of ideas transformed by personally justified and emotionally tinted interpretations (Walmsley, Young 1998; Strandberg et al. 2020). It results from the interaction of perceptual and cognitive evaluations as two interconnected components based on an individual's feelings towards a particular place (Baloglu,Brinberg 1997; Baloglu, McCleary 1999; Manyiwa et al. 2018; Zhang et al. 2018; Chakrabarty, Sadhukhan 2020).

Despite the indicated differences, distinguishing between the two afore-mentioned approaches proves difficult, as they frequently occur concurrently. Therefore, it is more accurate to describe the formation of a place image as an eclectic process of transforming a wide range of perceived attributes of a place (Matlovičová 2015). This process involves both narrowing and expanding the transmitted set of place attributes to include opinions, thoughts, facts, impressions, and beliefs, resulting in a fluid and variable image (Matlovičová 2015). The labelling of the place image as a "process" underscores its fluid nature (Table 1). Place image is constantly evolving in the mind; it is not a fixed transformed mental representation, but is constantly changing and being supplemented with new attributes based on direct or indirect contact with the place (Matlovičová 2015). In other words, it is an unstable mental trace that emerges in the mind of an individual whenever there is direct or mediated contact with the place (e.g., through a photograph, a mention in a conversation, a specific smell, a sound, etc.; Matlovičová 2015).

Post-structuralist Approach to Place Image

The foundation for this approach stems from the critique of semioticians (Matlovičová et al. 2019), who argue that their research overly synthesises representations of places and detaches them from the culture in which they are produced (Matlovičová 2015). A key premise of this approach is the notion that it is people and societies, rather than things themselves, that determine how realities are represented. Consequently, the formation of a place image is not seen as a simple reflection of the place, but rather as a guide for activities (Smith 2005). Building on Foucault and other post-structuralist theorists, Morgan and Pritchard (1999) introduce "cultural" perspectives to the study of place image. These perspectives allow the incorporation of power relations and historical context in the process of place image formation. Unlike perceptual approaches, this method does not focus on individual perception of places, but on shared meanings (Matlovičová 2015).

Traditional models of place image typically emphasise the individual consumer "*with minimal or no regard for social relationships*" (Selby 2004). But in a post-structuralist perspective, the place image is considered a representation of reality that is constructed socially rather than intimately or cognitively (Phillips 1993). This process involves understanding the "intersubjectivity" of the place image, or the shared nature of experiences and meanings (Shields 1991). Soja (1996) in this respect approaches place as a socially constructed and dynamic concept, emphasising that images of place are shaped by multiple narratives and perspectives. In his work, Soja (1996) explores the concept of "thirdspace", where real and imagined places intersect. A similar post-structuralist lens on the transformation of modern urban spaces, particularly with regard to their fragmented and decentralised nature, has been explored by Dear and Flusty (2010). In their view, place images are constructed and perceived differently by different groups, reflecting the complexity and multiplicity of urban experiences. Keith and Pile (1993) link the of place image and place identity. They argue that place image is constructed through discourses about the variable and contested nature of place identity on the basis of which the image is constructed.

Finally, certain approaches (e.g., Baloglu, McCleary 1999) recognise that place image is subjectively constructed and varies from individual to individual. At the same time, it is acknowledged as a socially constructed phenomenon, grounded in the concept of collective imagination.

Marketing Approach to Place Image

In this view, place image is considered a type of asset that a place can possess (Young,Lever 1997; Stylidis 2018). This means that it is approached as a set of attributes. If this set is strong and positive, it enhances the "value" of the place and

ultimately facilitates its development (Matlovičová 2015). The marketing approach essentially combines the previously mentioned perspectives, with a greater emphasis on the perceptual attributes that co-create the place image (Matlovičová 2015). For this reason, it is sometimes referred to as the psychological approach. Another reason is that marketing uses analytical tools from psychology to gain insights into the "minds of consumers" (Nghiêm-Phú 2015; Huang et al. 2021). It also draws on knowledge from related disciplines that study the human mind. The marketing approach comprehensively examines image formation (interdisciplinary perspective) with a strong focus on sciences studying human behaviour and the human brain (e.g. neuromarketing or cognitive science; Bramwell, Rawding 1996; Matlovičová 2015).

A specific feature of this approach is that, although it recognises (and accepts) high individual variability, it simultaneously assumes the existence of certain collectively perceived traits of places (at the group level) that could be the subject of further research (Matlovičová 2015). From this perspective, the marketing approach views place image as a collectively constructed construct, although it admits that at the interpersonal level it is individually formed at the interpersonal level as a set of unique associations that vary from person to person (Baloglu, McCleary 1999; Matlovičová 2015). This ambivalence makes it possible to study their formation at the individual level, while also exploring ways to influence them at the level of whole segments, once possible common group traits are identified (Matlovičová 2015). Inspiration for the creation of the necessary tools and a coherent concept of place image was primarily sought from commercial companies, which have extensive experience and proven methods in product image formation. However, as will be discussed later, the adaptability of these methods to the conditions of place marketing is problematic (Bramwell, Rawding 1996; Matlovičová 2015).

The marketing approach perceives place image as an individual construct, but also examines it as a group-constructed phenomenon, assuming that it shares common characteristics at a certain level of generalisation (Baloglu, McCleary 1999). This ambivalence is a source of difficulty, as it simultaneously examines a complex and purely individual phenomenon from a collective perspective. This contradiction in perception is reflected in approaches to its deliberate formation. These approaches are based on targeted influence of either a single selected segment (in the case of concentrated strategies), multiple segments (in the case of differentiated strategies), or the entire market uniformly without segmentation (in the case of undifferentiated strategies). The individual is seen as part of these segments and is not approached individually at this stage. Market segmentation assumes that, at a certain level of generalisation, consumers exhibit common traits that distinguish them from other groups. Based on these traits, target groups can be divided into relatively homogeneous segments (in terms of the criteria being

followed), which are expected to respond similarly to the same type of marketing communication (Matlovičová 2015).

In practice, the component approach is most commonly used to study place image. This approach is based on distinguishing the different groups of attributes that constitute or have the potential to constitute the image (Elliot, Papadopoulos 2016). Cognitive (knowledge-related), affective (emotional), and conative (specific activities associated with the place) attributes related to the place are distinguished (e.g., Walmsley, Young 1998; Gallarza et al. 2002; Baloglu, McCleary 1999; Gartner 1996; Matlovičová 2015; Herman et al. 2020a). In addition to these three groups of components, Avraham and Ketter (2008, 20) also identify a fourth group of evaluative components (how an observer evaluates the attributes of the place). In this respect, place image is perceived as the overall result of interactions among personal, individually formed beliefs, opinions, feelings, expectations, and impressions of the object (Chon 1994). Alternatively, the approach can see place image as a concept formed by emotional, personally justified interpretations of to the place, resulting from multiple interconnected and collectively exhibited perceptual, cognitive, and behavioural components (e.g., Walmsley, Young 1998; Baloglu, McCleary 1999; Beerli, Martin 2004; Bujdosó et al. 2019; Asmit et al. 2020; Baloglu, Brinberg 1997).

Marketing conceptualisations of image also differ in how these components interact. Some components may be selective in nature (Fakeye, Crompton 1991; Reynolds 1985), while others may be additive (Crompton 1979; Kotler et al. 1994).

In practice, marketing has adopted a concept that distinguishes between objective information about a place and its subjective evaluation. For example, Walmsley and Young (1998) argue that when identifying place images, it is necessary to distinguish between two "types" of images, depending on whether the emphasis is on perceptual perception (and evaluation) or cognitive creation of information about the environment or elements of the place. Similarly, Gartner (1996), Smith (2005) based on Boulding's earlier work (1961), asserts that the place image consists of distinct "cognitive" and "affective" (emotional) components. The cognitive component, he argues, is derived from known facts about the destination and needs to be further developed to generate awareness. Behavioural (or affective) components relate to motives, in terms of how the person considers the object (Gartner 1996). This dimension is clearly linked to the shift towards emotional or "mood" marketing in tourism (Morgan, Pritchar Pride 2002; Smith 2005; Klamár, Kozoň 2022).

A significant contribution to the discourse on the conceptualisation of place image can be attributed to the works of Echtner and Ritchie (1991; 1993; 2003). Their perspective on the possible components that form the image is distinct. According to their concept, the image consists of six different groups of components arranged along three intersecting axes (Matlovičová, Kolesárová

2012): 1 - the axis of functional and psychological components, 2 - the axis of holistic components and individually perceived attributes, and 3 - the axis of common and unique components. However, the authors note that there is no clear boundary between the groups, as they overlap. In other words, holistic feelings are based on a combination and interaction of attributes, just as perceptions of individual attributes can be influenced by overall impressions and feelings. In particular, they highlight the blurred boundary between the functional and psychological characteristics of the image (Echtner; Ritchie 1991; 1993; 2003).

Lynch's Urban Model of City Image

In the 1960s, a distinct perspective on place image, particularly city image, was developed within urban planning and architecture by Kevin Andrew Lynch in his seminal work, "*The Image of the City*" (Lynch 1960; 2004). Lynch introduced theoretical principles and terminology, and presented results from pilot studies in Boston, Jersey City, and Los Angeles (Lynch 2004, 14). Unlike the marketing approach, Lynch's model aimed to compare the visual forms of cities as proposed by professionals with the mental images formed by residents and the public, and to evaluate cities based on their spatial form in order to influence urban planning (Matlovičová 2015).

Lynch's approach focuses on the internal image of the city, using the assessments of pre-trained observers as a reference point for residents' perceptions. This method aims to enhance the perception of the city as pleasant, attractive, legible and navigable. Lynch emphasises the study of both tangible elements (buildings, streets, parks) and intangible elements (memories, experiences, feelings). He distinguishes between fixed and movable elements, and identifies identity, structure, and meaning as key components of the mental picture (image) of the city (Lynch 2004, 8).

Lynch asserts that the image of a city should be interpretable and under-standable, emphasising the characteristics of the physical environment that contribute to a clear, legible, and memorable image. He introduces the concept of imageability, which refers to the distinctive qualities of urban forms that impact the observer's senses and aid in navigation (Lynch 2004, 9). Lynch's methodology involves comparative mental maps to identify the most distinctive parts of the city as perceived by respondents (Lynch 2004, 144). Lynch's concept posits that cities with high imageability are perceived as well-formed and distinctive, stimulating interest and exploration. He identifies key elements such as paths, edges, districts, nodes, and landmarks, which are interconnected and overlapping (Lynch 2004, 46-49). Lynch views image formation as an interactive process between the observer and the environment, emphasising continuous transformation and open-endedness (Lynch 2004, 1). He suggests that city images can be altered either by

retraining observers or by changing the environment itself, acknowledging the influence of social conditioning and the potential of education to enhance image quality (Lynch 2004, 11, 164).

Lynch's concept of the city image, which focuses on cognitive aspects selectively perceived by individuals, can be classified as a perceptual composite construct. It emphasises the reduction of reality through selective perception, considering memories and previous experiences as factors in image transformation.

Political and Geopolitical Approach to Place Image

The political and geopolitical perspective is primarily assessed at the level of states (country image, national image), with a focus on building territorial reputation, public diplomacy, international relations, and political anthropology. The place image at the geopolitical level is influenced by its geopolitical alignment within the existing structures and groups through which it is perceived. This, in turn, can affect the place's negotiating power in the global competition for resources, particularly capital. This approach considers the perception of relationships between states and alliances that shape a country's image. Examining the quality of these relationships is central to the concept of the "enemy country image" or "ally country image" (e.g., Jervis 1976; Cottam 1977). In these cases, it is possible to study a range of perceptual differences, based on the component approach described in the marketing context. For example, Eicher et al. (2013) examined how value projection differs between allies and enemies, highlighting that images of ally and enemy countries are influenced by perceived security and power. The projection of values is higher for allies compared to enemies, indicating that national images are shaped by relational dynamics and power perceptions. National images are conceptualised as holistic schemas that shape attitudes and preferences in foreign policy (Rišová 2016). By altering subliminal associations with images of allies or adversaries, the study elucidates how cognitive schemas of national images impact perceptions and policy decisions (Castano et al. 2016). Similar to previous approaches, communication plays a pivotal role in influencing the image of a country, both internally and externally. The media significantly shapes a country's image through the framework of international relations and public diplomacy (Pjesivac et al. 2018). The formation of a country's image is influenced by a range of socio-political factors (Capozza et al. 2009). Findings from some studies (e.g., Haque, Lawson, 1980; Čaušević 2023) indicate that country images are formed reciprocally and are significantly affected by the dynamics of mutual relations, conflicts, or alliances. The concept of the enemy country image is unique due to the evident dichotomy and contradiction in assigning the status of "enemy country", depending on the perspective from which it is evaluated (Matlovičová 2015).

The image of states is also influenced by internal political relationships. The political perspective on the country image also focuses on examining the perception of state representatives' attitudes towards domestic and geopolitical issues within states, and their reflection on the country's image. For example, the country image may reflect separatist efforts of certain regions or attempts to change their status within the state (Matlovičová 2015). In the case of internal political problems, a geopolitical perspective can also be applied when the country image is assessed based on the positions taken by influential state representatives towards resolving the internal political problems of another country. These are usually non-standard cases of addressing internal issues that are media-worthy and capable of sparking broader international discussions (Matlovičová 2015).

Additional Approaches to Place Image

There are also other approaches to defining place image, which vary depending on the prevailing perspective and the objectives of its exploration. In addition to the aforementioned marketing approach (based on a psychological perspective with an emphasis on its contribution to territorial development), urban planning, political, and geopolitical perspectives, place image can also be viewed from a sociological standpoint (e.g. Espelt, Benito 2005; Borer 2006). This perspective emphasises cultural and social filters in the perception of a place. Numerous studies focus on the internal image of a place and its connection to territorial identity, understanding place perception as a "self-image" (Matlovičová 2015). From the perspective of social communication, place image is seen as a discursive phenomenon in personal, organisational, or mass media communication, with an emphasis on content analysis and the impact of media communication, referred to as the media image of a place (Avraham 2000; Herman et al. 2020a, b; Urminský 2018; Greydina 2023). There are also other perspectives on place image that are particularly applicable to place branding. Examples include the semiotic approach (e.g. Matlovičová et al. 2019), the hermeneutic approach (e.g. Jacobs 1993; Malinina 2021), place image as connotation, and the country-of-origin effect (e.g. Peterson, Jolibert 1995; Aiello et al. 2009; Matlovičová 2016), among others.

Place Reputation

The reputation of a place is the final concept in the triad of interrelated constructs and represents the highest level of generalisation of place perception. It is "formed" as a consensus-based collective evaluation by external audiences, including investors, tourists, and potential residents, regarding a specific place (location, city, sub-region, region, or macro-region; e.g. Anholt 2010; Paolucci, Sichman 2014; Yu, Wang, Gu 2022).

Reputation is considered a social construct emerging from collective beliefs and opinions shaped by societal factors (Hohle 2022; Sharman 2007). Simplified, it is the highest possible generalisation of place image into a collectively accepted dichotomous evaluation: good or bad reputation. Its study is primarily based on deduction, and aims to uncover the individual dimensions of the multifaceted constructs of place image and place identity from which it is derived. The connection between place reputation and place identity signifies that it reflects the unique characteristics and values that distinguish it from other places (Bell 2016; Lamour 2014). The connection to place image indicates that, like place image, it is dynamic and constantly evolving - changing over time based on new information, events, and developments (Nelson, 2015). For example, various crises can impact the reputation of a place. In such cases, a long-established reputation often shows significant resilience to negative shocks (Insch, Avraham 2014).

Insch and Avraham (2014) discuss managing place reputation during crises, emphasising strategies for image restoration and the role of residents in rebuilding the brand and restoring trust post-crisis. They highlight the importance of a strong positive image as part of the broader concept of place reputation (e.g., Bell 2016). It can thus be seen as an inherently relational construct, defined by the interactions between the place and its various stakeholders (Foroudi et al. 2020; Mariutti, Denes 2020; Morgan, Pritchard, Pride 2011; Sharman 2007).

Paolucci and Sichman (2014) note that the reputation of a place significantly influences the behaviour of external actors, including investors, tourists, and potential residents. Many authors (e.g., Foroudi et al. 2020; Su, Huang, Hsu 2018; Insch, Avraham 2014; Money, Hillenbrand 2006; Hayden 2001) consider it to be a critical intangible asset that significantly affects the competitiveness and success of development activities across various administrative levels. According to Nelson (2015), place reputation is a composite of perceptions held by external audiences. Akhmetshin et al. (2020) consider place reputation a key source of territorial competitiveness, aiding in establishing partnerships with stakeholders and ensuring the overall potential of the place by enhancing its attractiveness to various actors seeking to realize their interests.

Both authors emphasise the strategic importance of managing and improving place reputation to achieve economic and social goals. Reputation is thus formed by generalising evaluations of various aspects of a place, such as economic performance, cultural richness, governance, safety, and environmental quality, and requires a holistic approach to its management (Bell 2016). According to Bell (2016), place management requires a comprehensive approach that includes efforts to strategically shape its reputation.

The Interplay and Semantic Boundaries of Place Identity, Place Image and Place Reputation

As demonstrated, all three concepts - place identity, place image, and place reputation - are interrelated and overlap in some aspects, yet they also exhibit distinct differences that are crucial for effective management. The primary source of confusion lies in their ambiguous definitions, which are often either too broad or overly general, failing to explicitly delineate the distinguishing attributes from our perspective. *Place identity* and *place image*, as well as *place image* and *place reputation*, are the most frequently conflated or even equated concepts.

a) Place Image vs. Place Identity

The two concepts are interrelated and overlap in some areas, which often makes it difficult to distinguish between them. Let us summarise their main characteristics (see Table 1):

Individual vs. collective nature (or unique vs. pluralistic) - The image of a place has a distinctly individual character, differing from person to person. For each individual, it is a unique set of feelings, knowledge, prejudices, and emotional experiences related to the place. This characteristic can be considered one of the most salient attributes of place image, distinguishing it from place identity, which inherently tends towards a collective unified perception of a place's attributes. Although place image can also be explored for similarities at a certain level of generalisation in relation to groups, it remains fundamentally an individual construct. Thus, the same set of information about place identity is processed differently by each recipient. Although place identity is pluralistic, it is perceived more as a collective construct - representing who we are or what the place is. Image, in contrast, is an individual construct - how individuals perceive the place. Therefore, the bearer of a certain place identity is a group of residents associated with a specific place, while the bearer of a place image is an individual.

Detection vs. emanation - The image of a place has a perceptual-cognitive or detection nature, meaning the received information is processed consciously or subconsciously through a cognitive process into a unique individual perception. A place image is created based on the reception and transformation of a set of transmitted information, making it an active cognitive process rather than passive reception. Conversely, place identity is co-created and transmitted. Identity can thus be seen as an emanation of collectively generated attributes, whereas image is a perceptual and highly unstable entity. In this sense, identity is viewed as an objective entity, referring to a generally accepted consensus on the attributes representing the place. Place identity is understood as the emitted image of the place, while place image, from the perspective of the recipient, is understood as the "received" or detected image of the place.

Active creation vs. passive acceptance - From the individual's perspective, place image involves an active process of creating a specific image of the place that reflects the recipient's expectations. This process emphasises expanding perception to include attributes that mirror personal preferences and perception filters based on the recipient's expectations. In contrast, place identity involves the adaptation, subordination, and acceptance of predetermined image attributes. In other words, place identity "expects" the individual to conform to collectively accepted attributes. Therefore, while the individual sets perceptual filters for the place image, the filters for place identity are set by the collective perception, aligning with the majority's expectations.

Fluidity with higher vs. lower instability - Each place objectively evolves over time. The gradual alteration of its tangible and intangible attributes results in a change in its identity. Since the place image reflects elements of the identity, it also changes concurrently with these alterations. Both place identity and place image are therefore fluid in nature. What distinguishes them is the degree and intensity of variability over time. The higher instability of place image is due to the variability of personal attitudes, opinions, preferences, and other factors that influence its formation. Each subsequent interaction with the place or confrontation with information(s) about it refines or transforms the original image. Place image demonstrates much greater dynamics and instability. Even a seemingly insignificant event can cause a significant change in the place image (e.g., from positive to negative). An individual's place image can quickly change due to an ephemeral event that does not impact its identity. This event, while insignificant from an identity perspective, can create a strongly emotionally tinged mental trace in the individual's mind, which will resurface (sometimes for a long time) and thus influence the perception a particular place. Over time, its character can shift from specific (with all details recalled) to non-specific, transformed into a subconscious unpleasant feeling. In contrast, identity inherently tends toward generalisation and exhibits higher resilience to such effects. Changes in identity occur through regular repetition, stabilisation, and subsequent collective acceptance of specific attributes. Countless diverse ephemeral events experienced by individuals in connection with a place cause changes in the place's image but usually do not affect its identity.

Perspective "from the outside" vs. "from the inside" - The image of a place is more of an external perception, whether evaluated by outsiders or residents closely linked to it (place identity bearers have different perceptual filters than external audiences). It represents an external perspective enriched with feelings. In contrast, place identity is about self-presentation outward, representing an "from the inside" perspective.

Untraceable vs. traceable - Unlike place identity, place image does not leave spatial (visual) traces and it is practically impossible to map it, although there

are techniques to detect it. Place identity, on the other hand, leaves a clear visual imprint on the place, identifiable through various tangible and objective markers (the so-called "semes" - some intangible signs of the place, such as signifying signs of communication are also included among them), which carry and represent the distinguishing features of the place's identity. These can be studied using semiotic analysis, for example.

Eclectic vs. layered - The individual elements of a place image are a mixture of random, very diverse attributes, visual perceptions - images, scenes, experiences, feelings, sounds, etc. - which create an impression in the form of an assemblage of the most diverse elements and attributes of the place. This disorder and even the potential disorderliness is an inherent feature of the image. Identity, in contrast, can be considered layered, with an identifiable internal structure that can be tracked over time. For the image, this is challenging, if not impossible.

b) Place Image vs. Place Reputation

Differences between place image and place reputation can be identified at several levels (Table 1). Reputation, or renown, is understood as the general perception or good name of a place. It is a generalised form of partial images, reflecting the degree of their positivity. When answering the question, "*What reputation does someone or something have?*" we typically expect a response indicating whether it is "good" or "bad". This contrasts with the concept of place image, which addresses the question, "*What image does someone or something have?*" In this case, we expect a specific evaluation, comprising a set of particular subjective attributes, assessments, and feelings related to the place.

Both concepts are interconnected. Place reputation can be viewed as a highly generalised place image, assessed from the perspective of the positivity of partial evaluations, often framed in a dichotomy: good or bad. The challenge of applying reputation to places is that it requires excessive generalisation. In other words, reputation results from a collective consensus on the positivity of partial attributes of the place image, evaluated along a negative-positive continuum. The final evaluation depends on the direction in which public opinion ultimately leans. This means that the resulting assessment is largely shared in line with the presumed majority opinion, despite certain discrepancies in individual perceptions of the place. For instance, a city may have a stereotypically good reputation, but personal experiences of visiting it may be predominantly negative. Thus, in an individually formed image, negative attributes may dominate, yet this will not affect the overall accepted reputation of the city. For example, someone might share the generally accepted good reputation of Paris, but their personally created primary image of the city could consist mostly of negative attributes.

From a temporal perspective, place reputation exhibits greater stability but less specificity compared to place image. This means that changes in some components used in its formation may not immediately result in a transformation of the reputation. The outcome may be a slight shift on the negative-positive continuum. A significant change occurs only after crossing the threshold of neutral evaluation in either direction. Thus, a place may have a good reputation, while its image might be negative in certain evaluations. Place image demonstrates a higher degree of subjectivity, instability, and interpersonal differentiation than reputation.

One of the basic approaches to improving the reputation of a place is public relations. The key aspect here is to identify opinion leaders of a place who possess the power and ability to positively influence public opinion.

Reputation is understood as an aggregate of individual images. It is accumulated and evaluated over a period of time based on collective consensus and socially disseminated as a quasi-objective meta-evaluation of the place, without specifying the evaluator. According to Roebuck (2012), the foundation of reputation formation is the level of individual knowledge, which, through generalisation, reaches the level of social dissemination. Place reputation differs from place image in its greater stability and uniformity, being shaped more on a collective rather than an individual basis. Hohle (2022) and Sharman (2007) regard it as a social construct arising from collective beliefs and opinions, shaped by societal factors.

The aim of building a strong and positive place image should be to achieve a good reputation, that is, to build the place image that can be seen as part of the broader concept of place reputation (e.g., Bell, 2016). The aim of cultivating a good reputation is to attain prestige, i.e., social recognition and respect. When a place seeks to improve its reputation, it seeks to improve to enhance its image and thereby gain prestige, higher status or a greater degree of admiration and acceptance in the eyes of the general public than other competing places.

The interconnection of all three concepts can be summarised as follows (Figure 1): Place reputation is a highly generalised representation of the broad spectrum of partial attributes of place image. Place image, in turn, is the perception of the attributes of place identity as modified by the individual perceptual filters of each person.

Fig. 1 The Interplay of place identity, place image, and place reputation

Tab. 1 The interplay and semantic boundaries between Place Identity, Place Image, and Place Reputation

PLACE IDENTITY	PLACE IMAGE	PLACE REPUTATION
What is it like?	*What is it like?*	*Is it good or bad?*
IT IS WHAT DISTINGUISHES A PLACE FROM OTHER PLACES	**THE CURRENT PERCEPTIONS PEOPLE HAVE OF THE PLACE**	**GOOD OR BAD NAME**
A set of attributes that allow places to differentiated from others	A set of attributes, feelings and expectations associated with the place as perceived by individuals	A generalised form of partial attributes of the place image that are dichotomously assessed as being good or bad.
COLLECTIVELY FORMED • Pluralistic, shared, collective construct	**UNIQUE (DISTINCTIVE)** • Interpersonally specific, distinctive, formed on an individual basis • Similarities are also explored within target groups (segments)	**META-EVALUATION** • Formed as a consensus opinion on the positivity of the place image
SOCIALLY DETERMINED • Originates from the human need to belong and be part of a community	**INDIVIDUALLY CONSTRUCTED** • Conditioned by a unique set of subjective attributes of the recipient. • Socio-cultural conditioning is also acknowledged	**SOCIALLY DETERMINED** • Arises from collective beliefs and opinions shaped by social factors. • An inherently relational construct defined by interactions between the place and its various stakeholders
OBJECTIVE Perception of the Place • in the sense of a consensus on generally accepted attributes representing the place	**SUBJECTIVE** Perception of the Place • Varies from person to person • A subconscious selection of attributes, their supplementation, modification and reshaping according to individual knowledge, feelings and current perception filters	**QUASI-OBJECTIVE** Meta-evaluation of the place formed based on collective consensus • Reflects the generally accepted evaluation of the place without specifying the evaluator
LAYERED • It can be mapped over time, identifying its internal structure and changes • It leaves a distinct visual imprint on the place, identifiable through various material and objective markers	**ECLECTIC** • It is an assemblage of place attributes • It does not leave a spatial (visual) trace • It is practically impossible to map (though there are techniques to investigate it)	**DICHOTOMOUS** • It is good or bad
EMITTED • It is the intergenerational reproduction, shaping, and dissemination of information regarding the distinctive attributes of a place	**DETECTED** • It is the processing of transmitted information about the place • It is a perceptual-creative process of processing of selected information	**DETECTED** • It is the collective processing and acceptance of transmitted information about the place
CREATES ARCHETYPES & STEREOTYPES • These become inherent and distinguishing characteristics of the place	**CAN BE INFLUENCED BY STEREOTYPES** • The perception of a place is mostly influenced by specific, individually set filters of perception	**CREATES STEREOTYPES** • Functions as perception filter with high inertia and resilience to change

PLACE IDENTITY	PLACE IMAGE	PLACE REPUTATION
FLUID with **HIGHER INERTIA** • Exhibits higher stability • Naturally tends to generalise and is more resistant to change • Changes occur based on regular repetition and stabilisation, leading to collective acceptance of a specific attribute as part of its identity	**FLUID** with **LOW STABILITY** • It has a high degree of instability and variability over time. • Instability is amplified by the variability of personal attitudes, opinions, preferences, diverse ephemeral events associated with the place, etc. • Also influenced by changes in the identity of the place it represents	**FLUID** with **HIGHER INERTIA** • Exhibits high resistance to changes in generally accepted and publicly presented opinions about the place • Changes are conditioned by shifts in public opinion or individual experiences and personal perception filters
EMPHASIS ON COGNITIVE Attributes • Knowledge-producing • Emitting information about the differentiation of the place • Collective memory plays an important role	**EMPHASIS ON AFFECTIVE** Attributes • In addition to cognitive attributes, feelings, experiences, expectations, etc., also enter the process of transformation and reception of information	**EMPHASIS ON COGNITIVE** Attributes • Primarily cognitive attributes are involved in the acceptance process • Collective memory, stereotypes, and prejudices also play a role • Affective aspects may also be present, often as collective emotions (changes in public opinion)
From an Individual's Perspective: **PASSIVE** Acceptance of Image Attributes • Acceptance of given image attributes • Perception filters of the place are determined by the collective perception, in line with the majority's expectations	From an Individual's Perspective: **ACTIVE** Creation of Mental Picture • An active process of creating one's own, specific mental picture of a place • Perception filters are subconsciously set by the individual	From an Individual's Perspective: **PASSIVE** Acceptance of Majority Opinion • Perception filters are predominantly set collectively • Arises from collective beliefs and opinions shaped by social factors
"FROM THE INSIDE" Perspective • Self-presentation, directed outwards - from the inside out	**"FROM THE OUTSIDE"** Perspective • A kaleidoscope of perceptions from the external audience through individual perception filters (distorted and enriched by feelings, sensations) directed "inward." • Also an internal perspective on oneself, on the place with which one is identified (self-image)	**"FROM THE OUTSIDE"** Perspective • Collectively accepted perspective directed inward
CO-CREATED • Co-produced, formed through interactive processes between people and the place, as well as among people themselves	**REFINED AND TRANSFORMED** • Modification of transmitted information. • Effect of narrowing and expanding reality	**ADOPTED** • Arises from collective beliefs and opinions shaped by social factors

Source: own elaboration

CONCLUSIONS

This study sheds light on the nature of the interconnections and the semantic boundaries between the concepts of place identity, place image and place reputation. The examination of the relationships between these constructs was based on a meta-synthesis of 153 predominantly empirical studies, most of which examined these concepts individually. The research revealed that the delineation of place identity, place image and place reputation varies considerably depending on the perspective chosen by the authors, which can lead to confusion in the study and especially in the interpretation of the results.

This study considers place image as a subjective reflection of an objectively defined identity. In other words, image is the perception of identity, its reflection in the individual's consciousness, encompassing both cognitive and evaluative dimensions. Place identity is understood as a set of elements and attributes that characterise and differentiate a given territory from others. Place reputation represents the highest level of generalisation of territorial perception. It is "formed" as a consensual evaluation by external audiences into a collectively accepted dichotomous assessment: "good" or "bad" reputation. We have also shown that a common feature of the triad of evaluated concepts is their reliance on people who are their bearers and thus cannot be perceived separately from the social context. Their additional common and differentiating attributes are summarised in Table 1, which describes the basic theoretical framework of the concepts of place identity, image, and reputation applicable to place branding strategies, and place marketing and management aimed at enhancing the attractiveness of a place for potential target segments.

As shown in Figure 1, all three concepts are interconnected and interwoven. Put simply, place reputation is a highly generalised representation of the broad range of place image sub-attributes. Place image, in turn, is the perception of the attributes as modified by the individual perceptual filters of each person. Place identity attributes are considered strategic for achieving a desirable place image and a positive place reputation through coordinated and consistent communication. Understanding their interrelationships is therefore deemed crucial for effective place management, particularly for place branding, which must be based on a holistic approach and an understanding of the synergy within the triad of place identity, image, and reputation that forms its core.

In summary, the theoretical insights gained from this research underscore the importance of a holistic approach to place branding, one that integrates the dynamic and fluid nature of place identity, the subjective perceptions of place image, and the generalised evaluations of place reputation. By acknowledging and leveraging these interconnections, stakeholders can effectively foster attractive, competitive, and prosperous places, ultimately improving the quality of life for residents and enhancing the appeal for investors, tourists and new residents.

Acknowledgement

REFERENCES

AIELLO, G., DONVITO, R., GODEY, B., PEDERZOLI, D., WIEDMANN, K.-P., HENNIGS, N., SIEBELS, A., CHAN, P., TSUCHIYA, J., RABINO, S., SKOROBOGATYKH, I. I., WEITZ, B. A., OH, H., SINGH, R. (2009). An International Perspective on Luxury Brand and Country-of-Origin Effect. *Journal of Brand Management,* 16(5-6), pp. 323-337.

AITKEN R., CAMPELO A. (2011). The 4Rs of place branding. *Journal of Marketing and Management,* 27(9-10), pp. 913-933.

AKHMETSHIN, E., ILYINA, I., KULIBANOVA, V., TEOR, T. (2020). The methods of identification and analysis of key indicators affecting the place reputation in the modern information and communication space. *IOP Conf. Series: Materials Science and Engineering* 940 012100, IOP Publishing, doi:10.1088/1757-89 9X/940/1/012100.

ALTMAN I., LOW S. M. (EDS) (1992). *Place attachment*. Springer, New York, 336 p.

ANHOLT, S. (2007). *Competitive identity: The new brand management for nations, cities and regions*. London: Palgrave Macmillan. ISBN: 0230-500-285, 160 p.

ANHOLT, S. (2010). *Places – Identity, Image and Reputation*, Palgrave Macmillan. New York, ISBN-13: 978-0-230-23977-7, 168 p.

ASHWORTH G. J., VOOGD H. (1990). *Selling the City: Marketing Approaches in Public Sector Urban Planning*. London, Belhaven Press. ISBN: 185293008X.

ASMIT, B., SYAHZA, A., MAHDUM, A., RM, R. (2020). Opportunities and prospects for tourism development on Rupat Island, Indonesia. *Folia Geographica*, 62(2), pp. 133-148.

AVRAHAM, E. (2000). Cities and their news media images. *Cities*, 17(5), pp. 363-370.

AVRAHAM E., KETTER E. (2008). *Media Strategies for Marketing. Places in Crisis Improving the Image of Cities, Countries and Tourist Destinations*. Butterworth-Heinemann is an imprint of Elsevier, Oxford OX2 8DP, UK, 1. vydanie, ISBN: 978-0-7506-8452-1, 231 p.

BALMER J., GREYSER S. (2003). *Revealing the corporation*. Routledge, London, 365 p.

BALOGLU S., BRINBERG D. (1997). Affective images of tourism destination. *Journal of Travel Research*, 35 (4), pp. 11-15.

BALOGLU S., MCCLEARY K. W. (1999). A model of destination image formation. *Annals of Tourism Research*, 26 (4), pp. 868-897.

BARKER C., GALASINSKI D. (2001). *Cultural studies and discourse analysis: a dialogue on language and identity*. Sage Publications, London, ISBN: 9780761963837, 208 p.

BAXTER J., KERR G., CLARKE R. (2013). Brand orientation and the voices from within. *Journal of Marketing Management*, 29(9-10), pp. 1079–1098.

BEERLI A., MARTIN, J. D. (2004). Factors influencing destination image. *Annals of Tourism Research*, 31(3), pp. 657-681

BELL, F. (2016). Beyond Place Branding? The Emergence of Place Reputation: A Comparative Study of Newcastle Gateshead, Hull and Bristol. *Journal of Place Management and Development*, 9(3), pp. 247-254.

BOISEN M., TERLOUW K., VAN GORP B. (2011). The selective nature of place branding and the layering of spatial identities. *Journal of Place Management & Development*, 4(2), pp. 135-147.

BORER, M. (2006). The Location of Culture: The Urban Culturalist Perspective. *City & Community, 5*(2), pp. 173-197.

BOULDING K. (1961). *The Image: Knowledge in Life and Society*. University of Michigan Press, Michigan, ISBN 0-472-0604-73, 175 p.

BRAMWELL, B., RAWDING, L. (1996). Tourism marketing images of industrial cities. *Annals of Tourism Research*, 23(1), pp. 201-221.

BUJDOSÓ, Z., GYURKÓ, Á., BENKŐ, B. (2019). Tourism development in Hungary: On the example of the Northern Hungary region. *Folia Geographica*, 61(2), pp. 86-103.

BURGESS J., WOOD, P. (1988). Decoding Docklands. In Eyles J. & Smith D.M. (Eds): *Qualitative Methods in Human Geography*, pp. 94–117.

CAPOZZA, D., TRIFILETTI, E., VEZZALI, L., & ANDRIGHETTO, L. (2009). Americans are Barbarians or Allies? Images of Americans in the Italian Social Context. *Basic and Applied Social Psychology,* 31(1), pp. 60-68.

CASTANO, E., BONACOSSA, A., & GRIES, P. (2016). National Images as Integrated Schemas: Subliminal Primes of Image Attributes Shape Foreign Policy Preferences. *Political Psychology*, 37(3), pp. 351-366.

COTTAM R. W. (1977): *Foreign Policy Motivation: A General Theory and a Case Study*. Pittsburgh: University of Pittsburgh Press, ISBN: 0-8-2297-612-9, 384 p.

COWAN, A., STEWARD, J. (Eds) (2007). *The City and the Senses: Urban Culture since 1500*, Ashgate Publishing, Ltd. ISBN 9781138269170, 260 p.

CROMPTON J. L. (1979). An Assessment of the Image of Mexico as a Vacation Destination and the Influence of Geographical Location upon the Image. *Journal of Travel Research*, 18(4), pp. 18–23.

ČAUŠEVIĆ, A. (2023). The impact of the war between Russia and Ukraine on the attitudes of the inhabitants regarding tourist trips: The case of Bosnia and Herzegovina. *Folia Geographica*, 65(2), pp. 31-52.

DE CILLIA R., REISIGL M., WODAK R. (1999). The discursive construction of national identities. *Discourse & Society,* 10(2), pp. 149–173

DEAR, M., FLUSTY, S. (2010). Postmodern Urbanism. *Annals of the Association of American Geographers, 88*(1), pp. 50-72.

DEBORD G. (1994): *The Society of the Spectacle*, ZONE BOOKS 611, New York, from the original *La Société du spectacle, Buchet Chastel* published in 1967, 64 p.

DENES, A., PRADIT, A. (2022). Special Feature Chiang Mai's Intangible Cultural Heritage: Urban Revitalization & Cultural Identity in a Northern Thai City. *Journal of Urban Culture Research*, Volume 25, pp. 3-17.

DINNIE K. (2008). *Nation Branding: Concepts, Issues, Practice*. Butterworth-Heinemann, ISBN: 9780750683494, 264 p.

DOWNS, R. M., STEA, D. (1973). *Image and Environment: Cognitive Mapping and Spatial Behavior*. Routledge, https://doi.org/10.4324/9780203789155, 439 p.

ECHTNER C. M., RITCHIE, J. R. B. (1991): The meaning and measurement of destination image. *The Journal of Tourism Studies*, 2(2), pp. 2-12.

ECHTNER C. M., RITCHIE J. R. B. (1993). The Measurement of Destination Image: An Empirical Assessment, *Journal of Travel Research*, 31(4), pp. 3–13.

ECHTNER C. M., RITCHIE R. B. (2003). The Meaning and Measurement of Destination Image. *The Journal of Tourism Studies*, 14(1), pp. 37-48.

EICHER, V., PRATTO, F., WILHELM, P. (2013). Value Differentiation Between Enemies and Allies: Value Projection in National Images. *Political Psychology, 34*(1), pp. 127-144.

ELLIOT, S., PAPADOPOULOS, N. (2016). Of products and tourism destinations: An integrative, cross-national study of place image. *Journal of Business Research, 69*(3), pp. 1157-1165.

ESPELT, N. G., BENITO, J. A. D. (2005). The social construction of the image of Girona: a methodological approach. *Tourism Management, 26*(6), pp. 777-785.

FAKEYE P. C., CROMPTON J. L. (1991). Image Differences Between Prospective, First-Time, and Repeat Visitors to the Lower Rio Grande Valley. *Journal of Travel Research, 30*(2), pp. 10–16.

FLOREK M. (2011). No place like home: perspectives on place attachment and impacts on city management. *Journal of Town & City Management*, 1(4), pp. 346-354.

FOROUDI, P., CUOMO, M. T., FOROUDI, M. M., KATSIKEAS, C. S., GUPTA, S. (2020). Linking identity and heritage with image and a reputation for competition. *Journal of Business Research*, 113, 317-325. https://doi.org/10.1016/j.jbusres.2019.09.042.

FRETTER D. (1993). Place marketing: a local authority perspective. In: Kearns G., Philo C. (Eds): *Selling places, the city as cultural capital past and present*. Pergamon Press, Oxford, pp. 163-174.

GALLARZA G. M., SAURA G. I., GARCÍA C. H. (2002). Destination Image. Towards a Conceptual Framework. *Annals of Tourism Research*, 29(1), Elsevier, pp. 56-78.

GARDINI, S., CORNOLDI, C., BENI, R., VENNERI, A. (2009). Cognitive and neuronal processes involved in sequential generation of general and specific mental images. *Psychological Research PRPF*, 73, pp. 633-643.

GARTNER W.C. (1993). Image Formation Process. *Journal of Travel & Tourism Marketing*, The Haworth Press, pp. 191-215.

GARTNER W. C. (1996). *Tourism Development: Principles, Policies, and Policies*. New York: Van Nostram Reinhold, ISBN: 978-0-471-28447-5, 560 p.

GELLI, F., URICCHIO, T., HE, X., BIMBO, A., CHUA, T. S. (2019). Learning subjective attributes of images from auxiliary sources. *MM '19: Proceedings of the 27th ACM International Conference on Multimedia*. October 2019, pp. 2263–2271, https://doi.org/10.1145/3343031.3350574.

GIDDENS, A. (1984). *The constitution of society*. University of California Press, Berkeley, ISBN-13: 978-052-0057-289, 417 p.

GOLLEDGE, R. G., STIMSON, R. J. (1997). *Spatial Behavior: A Geographic Perspective*. Guilford Press. ISBN 9781572300507, 620 p.

GOSPODINI, A. (2016). Urban Design, Urban Space Morphology, Urban Environment. *European Planning Studies*, 24(5), pp. 899-918.

GOULD, P., WHITE, R. (1986). Mental Maps. Routledge. 2nd edition, ISBN 9780415084826, 188 p.

GOVERS, R., GO, F. M. (2009). Place branding: Glocal, virtual and physical identities, constructed, imagined and experienced. *Palgrave Macmillan*. https://doi.org/10.1057/9780230247024

GREYDINA, N. (2023). Media Image of Russia Metaphorization (Based on the English Language). *Scientific Research and Development. Modern Communication Studies*. 12 (2).

HALL, C. M. (2008). Servicescapes, designscapes, branding, and the creation of place-identity: South of Litchfield, Christchurch. *Journal of Travel & Tourism Marketing* 25(3), pp. 233–250.

HALL S. (2003). *Representation: cultural representations and signifying practices*. Open University, Sage, ISBN-13: 978-0761-954-323, 408 s.

HAGUE C. (2005). Planning and place identity, s. 3-19. In: Hague C., Jenkins P. (eds) (2005): *Place identity, participation and planning*. Routledge, Oxfordshire, ISBN 0-415-262410, 250 p.

HAQUE, A., LAWSON, E. D. (1980). The mirror image phenomenon in the context of the Arab-Israeli conflict. *International Journal of Intercultural Relations,* 4(1), pp. 107-115.

HAYDEN, K.E. (2001). Stigma and Place: Space, Community, and the Politics of Reputation, *Studies in Symbolic Interaction* 23, pp. 219-239.

HERNÁNDEZ, B., HIDALGO, M. C., SALAZAR-LAPLACE, M., HESS, S. (2007). Place attachment and place identity in natives and non-natives. *Journal of Environmental Psychology*, 27(4), pp. 310-319.

HERMAN, G. V., GRAMA, V., SONKO, S. M., BOC, E., BĂICAN, D., GARAI, L. D., BLAGA, L., JOSAN, I., CACIORA, T., GRUIA, K. A., GRECU, A., PEPTENATU, D. (2020a). Online

information premise in the development of Bihor tourist destination, Romania. *Folia Geographica*, 62(1), pp. 21-34.

HERMAN, G. V., BANTO, N., CACIORA, T., GRAMA, V., UNGUREANU, M., FURDUI, S., BUHAŞ, R., BUHAŞ, S. (2020b). Tourism in Bihor County, Romania: Trends and prospects. *Folia Geographica*, 62(2), pp. 87-105.

HOHLE, R. (2022). Rusty gardens: stigma and the making of a new place reputation in Buffalo, New York. *American Journal of Cultural Sociology* 11, pp. 193–219, https://doi.org/10.1057/s41290-022-00159-0.

HUANG, J., OBRACHT-PRONDZYŃSKA, H., KAMROWSKA-ZAŁUSKA, D., SUN, Y., LI, L. (2021). The image of the City on social media: A comparative study using "Big Data" and "Small Data" methods in the Tri-City Region in Poland. *Landscape and Urban Planning, 206*, 103977.

CHAKRABARTY P., SADHUKHAN S. K. (2020). Destination Image for Pilgrimage and Tourism: A Study in Mount Kailash Region of Tibet. *Folia Geographica*, 62(2), pp. 71-86.

CHENG Z, ZHANG B. (2021) Capital flows, place image, and place identity: Bridges in San Jiadian historic and cultural village in Beijing. *Area*. 2021, pp. 53:531–542. https://doi.org/10.1111/area.12717,

CHON, K. S. (1994). The role of destination image in tourism: A review and discussion. *Tourist Review*, 45(2), 2-9. https://doi.org/10.1108/eb058040.

CHROMÝ P., SEMIAN M., KUČERA Z. (2014). Regionální vědomí a regionální identita v Česku: případová studie Českého ráje, *Geografie*, 119 (3), pp. 259-277.

INSCH, A., AVRAHAM E. (2014). Managing the reputation of places in crisis. Guest Editorial. *Place Branding and Public Diplomacy* 10 (2014), pp. 171–173. doi:10.1057/pb.2014.18.

JACOBS, J. (1993). The City Unbound: Qualitative Approaches to the City. *Urban Studies*, 30(5-6), pp. 827-848.

JERVIS R. (1976). *Perception and Misperception in International Politics*. Princeton, Princeton University Press. ISBN: 9781400873135, 464 p.

JOHNOVÁ, R., ČERNÁ J., ONDRÁŠEK T., MRÁZIKOVÁ E., LUKEŠ M., JEŽEK V. (2007). *Arts marketing, Marketing umění a kulturního dědictví*. Vysoká škola ekonomická v Prahe, Nakladateľstvo Oeconomica, Praha, ISBN: 978-80-245-1276-12, 244 p.

KALANDIDES A., KAVARATZIS M. (2009). Guest editorial: from place marketing to place branding and back: a need for re- evaluation, *Journal of Place Management and Development*, 2(1), pp. 5–7.

KAPPRAFF, J. (2002). *Connections: The Geometric Bridge Between Art and Science.* World Scientific Publishing Company; 2nd edition (November 29, 2001), ISBN-10-9810245866, ISBN-13-978-9810245863, 470 p.

KAVARATZIS, M., HATCH, M. J. (2013). The dynamics of place brands: An identity-based approach to place branding theory. *Marketing Theory*, 13(1), pp. 69-86.

KAVARATZIS, M. (2017). The participatory place branding process for tourism: Linking visitors and residents through the city brand. In Bellini, N., Pasquinelli, C. (Eds). *Tourism in the City*. Springer, DOI:10.1007/978-3-319-26877-4_6, pp. 93-107.

KAVARATZIS, M., GIOVANARDI, M., LICHROU, M. (2017). *Inclusive Place Branding: Critical Perspectives on Theory and Practice*. Routledge. ISBN 9780367877316, 218 p.

KEITH, M., PILE, S. (1993). Introduction Part 1: The Politics of Place. In *Place and the Politics of Identity* (pp. 1-21). Routledge, ISBN 9780415090094, 244 p.

KERR, G., BALAKRISHNAN, M. S. (2012). Challenges in managing place brands: The case of Sydney. *Place Branding and Public Diplomacy* 8 (1), pp. 6 – 16. doi: 10.1057/pb.2011.32.

KITCHIN, R. M. (1994). Cognitive maps: What are they and why study them? *Journal of Environmental Psychology*, 14(1), pp. 1-19.

KLAMÁR, R., KOZOŇ, J. (2022). Cross-border shopping tourism: Case study to compare two regions of the North-Eastern Slovakia. *Folia Geographica*, 64(2), pp. 46-85.

KOTLER P., HAIDER D. H., REIN I. (1994). *Mercadotecnia de Localidades* (Destination marketing organization). In Gallarza G. M., Saura G. I., García C. H. (2002): Destination Image. Towards a Conceptual Framework. *Annals of Tourism Research*, 29(1), Elsevier, pp. 56-78.

LAMOUR, Ch. (2014). Territorial reputation beyond state borders? Metropolitan images in European borderlands. *Place Branding and Public Diplomacy* 10(1), pp. 19–31. doi:10.1057/pb.2013.26.

LASSWELL H. (1948): The Structure and Function of Communication in Contemporary Society. In Bryson L. (Ed.) *The Communication of Ideas*, New York, IRSS, s. 31−57.

LYNCH K. (1960): *The Image of the City*. Cambridge Massachussettes, MIT Press, ISBN: 0-2626-200-14, 194 p.

LYNCH, K. (2004). *Obraz města / The Image of the City* (in Czech). Bova Polygon, Praha, 2004, ISBN: 80-7273-094-0, 202 p.

MALININA, N. (2021). Urbanism and Cultural Studies: Synergy of Methodological Approaches (on the Example of the City of Vladivostok). *IOP Conference Series: Materials Science and Engineering, 1079*.Manyiwa et al. 2018.

MARIUTTI, F.,DENES, D. (2020). A meta-synthesis of qualitative country reputation in search of building theory. *Brazilian Journal of Marketing*, 19(3), pp. 705-730. https://doi.org/10.5585/remark.v19i3.15874.

MATLOVIČOVÁ, K. (2016). Country-of-Origin (COO) koncept - jeho vymedzenie, determinanty a možnosti využitia v marketingovej praxi. In: Nováček A. (ed.) (2016): *Geografické myšlení jako aktuální společenská výzva,* Proceedings of the CGS Annual Conference, 5 - 7 September 2016 (in Slovak), České Budějovice, Jihočeská univerzita, ISBN:978-80-7394-619-7, pp. 99-108.

MATLOVIČOVÁ, K. (2015). *Značka územia* / Place brand (text book in Slovak). Prešovská univerzita v Prešove, ISBN: 978-80-555-1529-8, 320 p.

MATLOVIČOVÁ, K., KOLESÁROVÁ, J. (2012). Destination Image and Possibilities of its Formation: A Case Study of the Image of Thailand as a Tourist Destination Perceived by Slovaks. *Central European Regional Policy and Human Geography* II (1), pp. 7-22.

MATLOVIČOVÁ, K., TIRPÁKOVÁ E., MOCÁK P. (2019). City Brand Image: Semiotic Perspective. A Case Study of Prague. *Folia Geographica*, Volume 61, No. 1, pp. 120 -142, ISSN 1336-615.

MAYO E., JARVIS L. (1981). *The Psychology of Leisure Travel*. CBI Publishing, Boston, ISBN: 084-362-204-0, 281 p.

MCCUNN, L. J., GIFFORD, R. (2017). Spatial navigation and place imageability in sense of place. *Cities*, 74, pp. 208-218.

MERRILEES, B., MILLER, D., HERINGTON, C. (2016). Multiple stakeholders and multiple city brand meanings. *European Journal of Marketing*, 50(9/10), pp. 1572-1592.

MICHALKOVÁ, J. (2014). Place branding as a phenomenon of a globalizing world: Theoretical background. *Folia Geographica*, 56(2), pp. 56-69.

MILLER G. A. (1956). The Magical Number Seven. Plus or Minus Two: Some Limits on Our Capacity for Processing Information, *Psychological Review*, č. 63, p. 81-97.

MONEY, K., HILLENBRAND, C. (2006). Using Reputation measurement to create value: An analysis and integration of existing measures. *Journal of General Management* 32 (1), pp. 1-12.

MORGAN N., PRITCHARD A. (1999). *Tourism Promotion and Power: Creating Images, Creating Identities*. Wiley, Chichester, ISBN: 978-0-471-98341-5, 272 p.

MORGAN N., PRITCHARD A., PRIDE R. (2002). *Destination Branding: Creating the Unique Destination Proposition* (2nd edition), Elsevier, Oxford, ISBN: 0-7506-5969-6, 314 p.

MORGAN, N., PRITCHARD, A., PRIDE, R. (2011). *Destination brands: Managing place reputation* (3rd edition). Butterworth-Heinemann, USA, ISBN: 978-0080969305, 370 p.

MUELLER A., SCHADE M. (2012). Symbols and place identity, a semiotic approach to internal place branding—case study Bremen (Germany). *Journal of Place Management and Development*, Emerald, 5(1), pp. 81–92.

NASAR, J. L. (1992). Environmental Aesthetics: Theory, Research, and Applications. Cambridge University Press, ISBN-10- 9780521429160, ISBN-13-978-0521429160, 560 p.

NELSON, V. (2015). Place reputation: Representing Houston, Texas as a creative destination through culinary culture. *Tourism Geographies*, 17(2), pp. 192-207. https://doi.org/10.1080/14616688.2014.986751.

NGHIÊM-PHÚ, B. (2015). Projected country image: An investigation of provinces/ cities' logos. *Asia Pacific Journal of Tourism Research, 20*(12), pp. 1466-1485.

PAASI, A. (2002). Bounded spaces in the mobile world: Deconstructing 'regional identity'. *Tijdschrift voor Economische en Sociale Geografie*, 93(2), pp. 137-148. https://doi.org/10.1111/1467-9663.00190.

PAOLUCCI, M., SICHMAN, J. S. (2013). Reputation to understand society. *Comput Math Organ Theory* 20, pp. 211–217, https://doi.org/10.1007/s10588-013-9168-8.

PAPADOPOULOS, N., HESLOP, L. (2002). Country equity and country branding: Problems and prospects. *Journal of Brand Management*, 9(4), pp. 294-314

PARENTEAU A. (1995). Marketing Práctico del Turismo. Madrid: Síntesis S.A., in Gallarza, M. G., Gil S. I., Calderon G. H. (2002): Destination Image: Towards a Conceptual Framework, *Annals of Tourism Research* 29 (1), pp. 56-78.

PETERSON, R., JOLIBERT, A. (1995). A Meta-Analysis of Country-of-Origin Effects. *Journal of International Business Studies,* 26(4), pp. 883-900.

PHILLIPS R. (1993). The Language of Images in Geography. *Progress in Human Geography*, 17(2), pp. 180-194.

PJESIVAC, I., LUTHER, C. A., IMRE, I. (2018). Constructing an image of the United States in the British and French editorials about WikiLeaks. *The Journal of International Communication*, 24(2), pp. 216-237.

PROSHANSKY, H. (1978). The City and Self-Identity. *Environment and Behavior*, 10(2), pp. 147-169.

RAUSELL-KÖSTER, P., GHIRARDI, S., SANJUÁN, J. , MOLINARI, F., ABRIL, B. (2022). Cultural experiences in the framework of "cultural cities": measuring the socioeconomic impact of culture in urban performance. *City Territ Archit* 40(9). https://doi.org/10.1186/s40410-022-00189-8.

RELPH E. (1976). *Place and Placelessness*. Pion, London, ISBN: 08-5086-17-64, 156 p.

REYNOLDS W. H. (1965). The role of the consumer in image building. *California Management Review*, pp. 69-76

REYNOLDS W. H. (1985). The Role of the Consumer in Image Building. *California Management Review,* 7(3), pp. 69.

RIŠOVÁ, K. (2016). Measurement of subjective and objective dimension of quality of life in geography: Overview of approaches. *Folia Geographica*, 58(2), pp. 54-69.

RODRIGUES, C., SKINNER, H., DENNIS, C. AND MELEWAR, T. C. (2020). Towards a theoretical framework on sensorial place brand identity. *Journal of Place Management and Development*, 13(3), pp. 273-295. https://doi.org/10.1108/JPMD-11-2018-0087.

RODRIGUEZ, F., GARCIA-HANSEN, V., ALLAN, A., ISOARDI, G. (2021). Subjective responses toward daylight changes in window views: Assessing dynamic environmental attributes in an immersive experiment. *Building and Environment, 195*, 107720.

ROEBUCK K. (2012). *Reputation Management: High-impact Strategies - What You Need to Know: Definitions, Adoptions, Impact, Benefits, Maturity, Vendors*. Emereo Publishing, 2012, ISBN: 1743049579, 9781743049570, 96 pp. 46-47.

SCOTT C., CORMAN S., CHENEY G. (1998). Development of a structural model of identification in the organisation. *Communication Theory*, Vol. 8, č. 3, pp. 298–336.

SELBY M. (2004). *Understanding Urban Tourism: Image, Culture and Experience*. IB Tauris, Londýn, ISBN: 978-1860-6480-14., 272 p.

SHARMAN, J. C. (2007). Rationalist and constructivist perspectives on reputation. *Political Studies, 55*(1), 20-37, https://doi.org/10.1111/j.1467-9248.2007.00643.x.

SHIELDS R. (1991). *Places on the Margin: Alternative Geographies of Modernity*. Routledge, London, ISBN: 041-50-802-23, 334 p.

SHORT, J. R. (2017). *A Research Agenda for Cities*. Edward Elgar Publishing. ISBN-10-1785363417, ISBN-13-978-1785363412, 320 p.

SIWEK T. (2011). Percepce geografického prostoru. Česká geografická společnost, Praha, ISBN 978-80-904521-7-6, 163 p.

SKANDALIS, A., BYROM, J., BANISTER, E. (2017). Spatial taste formation as a place marketing tool: the case of live music consumption. *Journal of Place Management and Development*, 10(5), pp. 497-503, doi: 10.1108/JPMD-01-2017-0009.

SMITH, A. (2005). Conceptualizing City Image Change: The 'Re-Imaging' of Barcelona, *Tourism Geographies*, 7(4), pp. 398–423.

SOJA, E. W. (1996). *Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places*. Blackwell, ISBN-10- 1557866759, ISBN-13- 978-1557866752, 352 p.

STANOWICKA, A. (2020). The image of a city in selected theories of regional development. *Ekonomia i Prawo*, 19(2), pp. 135-148.

STEA, D. (2017). *Image and Environment: Cognitive Mapping and Spatial Behavior*. Routledge. ISBN 9780203789155, 439 p., https://doi.org/10.4324/9780203789155.

STOKER G., MOSSBERGER K. (1994). Urban Regime Theory in Comparative Perspective, *Environment and Planning C*, 12, pp. 195–212.

STRANDBERG, C., STYVÉN, M. EK, HULTMAN, M. (2020). Places in good graces: The role of emotional connections to a place on word-of-mouth. *Journal of Business Research*, Elsevier, 119(C), pp. 444-452, https://doi.org/10.1016/j.jbusres.2019.11.044.

STYLIDIS, D. (2018). Residents' place image: Place to live versus tourist destination. *Tourism Analysis.* 23(4), pp. 553-560(8)https://doi.org/10.3727/108354218X15391984820512.

SU, L., HUANG, Y., HSU, M. (2018). Unraveling the impact of destination reputation on place attachment and behavior outcomes among Chinese urban tourists, *Journal of Hospitality and Tourism Insights*, 1(4), pp. 290-308, https://doi.org/10.1108/JHTI-11-2017-0026.

SZŰCS, A., KONCZ, G. (2020). Sport, as an influencing factor of the quality of life and regional competitiveness: The case study of Jászárokszállás (Hungary). *Folia Geographica*, 62(1), pp. 142-157.

TERLOUW K. (2009). Rescaling Regional Identities: Communicating Thick and Thin Regional Identities. *Studies in Ethnicity and Nationalism*, Vol. 9, pp. 452-464.

TÓTH, B. Z., (2023). Mixed-Use Developments in Phoenix and Tempe, Arizona: Sustainability Concerns and Current Trends. *Folia Geographica* 65(2), pp. 53-77.

TUAN, Y.-F. (1975). Place: An Experiential Perspective. *Geographical Review*, 65(2), 151-165.

URMÍNSKÝ, J. (2018). Regions in TV news broadcasting: Selected aspects on the example of the Czech Republic. *Folia Geographica*, 60(2), pp. 83–100.

WALMSLEY D., YOUNG M. (1998). Evaluative images and tourism: The use of personal constructs to describe the structure of destination images. *Journal of Travel Research*, 36(3), pp. 65-69.

WÄCKERLIN, N., HOPPE, T., WARNIER, M., JONG, W. D. (2019). Comparing city image and brand identity in polycentric regions using network analysis. *Place Branding and Public Diplomacy,* 16(1), pp. 80-96.

WÄCKERLIN, N., HOPPE, T., WARNIER, M., JONG, W. D. (2019). Comparing city image and brand identity in polycentric regions using network analysis. *Place Branding and Public Diplomacy,* 16(1), pp. 80-96.

YANITSKIY, M. S., SERYY, A., BRAUN, O. A., BALABASHCHUK, R. O., MASLOVA, O., MIK-LYAEVA, A., TERESHCHENKO, V., FILENKO, I. A., SANZHAEVA, R., DAGBAEVA, S., NEYASKINA, Y. Y., KADYROV, R. (2021). The image of the world as a psychological system and its environmental determinants. *Sibirskiy Psikhologicheskiy Zhurnal*.

YOUNG, C., LEVER, J. (1997). Place promotion, economic location and the consumption of city image. *Tijdschrift voor economische en sociale geografie, 88*(4), 332-341.

YU, C., WANG, T., GU, X. (2022). Collective reputation cognition, network competence and enterprise innovation performance. *Management Decision*, 60(3), pp. 567-588. https://doi.org/10.1108/MD-10-2019-1420.

ZENKER, S., BRAUN, E. (2010). Branding a city: A conceptual approach for place branding and place brand management. In *39th European Marketing Academy Conference (EMAC)*, Copenhagen, pp. 1-4.

ZENKER, S. (2011). How to catch a city? The concept and measurement of place brands. *Journal of Place Management and Development*, 4(1), pp. 40-52. https://doi.org/10.1108/17538331111117151.

ZENKER, S., BRAUN, E., PETERSEN, S. (2017). Branding the Destination versus the Place: The Effects of Brand Complexity and Identification for Residents and Visitors. *Tourism Management*, 58, pp. 15-27.

ZHANG, F., ZHANG, D., LIU, Y., LIN, H. (2018). Representing place locales using scene elements. *Comput. Environ. Urban Syst.*, 71, pp. 153-164.

FOLIA GEOGRAPHICA