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

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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
Environ-mental	– 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 reproduction and accumulation, commodification of social reproduction, social inequalities, demographic shifts, urban decay, erosion of social cohesion, large-scale forced migrations, collapse or lack of public infrastructure 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 erosion 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 discusse 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, crossdisciplinary, 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.

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