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THEORETICAL-METHODOLOGICAL PROTOCOL FOR FIELDWORK IN PHYSICAL GEOGRAPHY

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THEORETICAL-METHODOLOGICAL PROTOCOL FOR FIELDWORK IN PHYSICAL GEOGRAPHY

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Abstract

The systematization of a theoretical-methodological approach to fieldwork in Physical Geography requires convergence between intellectual reflection and empirical observation. This study proposes six guiding axioms based on a systematic literature review that integrates Kantian philosophy with the main foundations of Physical Geography: geomorphological, geosystemic, geoeological, and landscape cartography approaches. This theoretical foundation supports the following axioms: location and orientation; identification and description of morphologies; spatiotemporal dynamics; genesis and dispersion; classification of structures and processes; and systemic relationships. The organization of this framework provides an accessible methodological guide for geographers and geoscience professionals, enhancing data collection and the interpretation of geographical reality in the field.

Keywords: Geographic axiom; Landscape; Morphologies.

Resumo / Resumen

PROTOCOLO TEÓRICO-METODOLÓGICO PARA O TRABALHO DE CAMPO EM GEOGRAFIA FÍSICA

A sistematização de uma abordagem teórico-metodológica para trabalho de campo em Geografia Física exige convergência entre reflexão intelectual e observação empírica. Este estudo propõe seis axiomas norteadores fundamentados em uma revisão sistemática da literatura que articula a filosofia Kantiana às principais bases da Geografia Física: geomorfológica, geossistêmica, geoeológica e cartografia de paisagens. Essa fundamentação sustenta os axiomas: localização e orientação; identificação e descrição de morfologias; dinâmica espaço-temporal; gênese e dispersão; classificação de estruturas e processos; e relações sistêmicas. A organização desse arcabouço fornece um guia metodológico acessível a geógrafos e profissionais das geociências, qualificando a coleta de dados e a interpretação da realidade geográfica em campo.

Palavras-chave: Axioma Geográfico; Paisagem; Morfologias.

PROTOCOLO TEÓRICO-METODOLÓGICO PARA EL TRABAJO DE CAMPO EN GEOGRAFÍA FÍSICA

La sistematización de un enfoque teórico-metodológico para el trabajo de campo en Geografía Física requiere la convergencia entre la reflexión intelectual y la observación empírica. Este estudio propone seis axiomas rectores basados en una revisión sistemática de la literatura que articula la filosofía kantiana con los fundamentos principales de la Geografía Física: geomorfología, geosistémica, geoeología y cartografía del paisaje. Estos fundamentos sustentan los axiomas: localización y orientación; identificación y descripción de morfologías; dinámica espacio-temporal; génesis y dispersión; clasificación de estructuras y procesos; y relaciones sistémicas. La organización de este marco proporciona una guía metodológica accesible para geógrafos y geocientíficos, mejorando la recopilación de datos y la interpretación de la realidad geográfica en el campo.

Palabras-clave: Axioma Geográfico; Paisaje; Morfologías.

INTRODUCTION

All scientific fields involve the direct observation of their object of study. In Physical Geography, fieldwork is the primary means of data collection. More than a work procedure, it is an intellectual and scientific activity that goes beyond the mere aesthetic contemplation of the landscape, that is, a simple walk. Rather, it requires an empirical exercise supported by theoretical depth to achieve an understanding of the completeness of natural systems (GOMES, 2022; ARRAES, 2018).

Reading the landscape as a dynamic system of physical processes and living organisms reveals complexity, requiring the solid construction of cognitive structures sufficiently grounded in theory. Thus, the challenge arises of capturing and interpreting, in the field, different materials/bodies, phenomena, relationships/connections, extensions, and spatial and temporal processes exhibiting cyclical and stochastic behaviors. For geographers to validate the knowledge acquired in the field as scientific, they must identify and apply techniques for observation and measurement, as well as integrate theoretical and methodological approaches relevant to the spatial area under study. Therefore, a structured guide is needed to provide direction for the sequence of activities (CAVALCANTI, 2011).

Despite its long tradition in Physical Geography (GREGORY, 1992), there is a gap in the theoretical-methodological framework, particularly regarding studies that offer an integrated understanding of theories, data collection techniques, and data processing related to the real world, especially as an initial guide for those undertaking fieldwork for the first time.

Observation involves connecting prior knowledge with facts and phenomena in nature. However, delineating the different physical-natural elements that make up the landscape is not an easy task, since the abstraction of concepts depends on the ability to describe the element encountered. For example, when encountering a morphology in the field that appears to be a fault scarp, the following prerequisites must be met: the landform must have resulted from the vertical or horizontal displacement of faulted blocks or from the exhumation of a fault plane previously truncated by erosion (IBGE, 2009). In this way, empirical evidence and theory are progressively connected.

For these reasons, this paper systematizes a theoretical-methodological proposal designed to contribute to the foundations of fieldwork in Physical Geography, maintaining methodological rigor in bridging the conceptual and real worlds. Thus, driven by the need to structure our thinking in order to understand phenomena in the real world, we begin with a fundamental question: in the field, how can concepts in Physical Geography be connected to the different elements of the landscape structure?

METHODOLOGY

The research is based on a qualitative and exploratory approach, structured around two complementary components: theoretical-epistemological foundations and a systematic literature review protocol.

The theoretical-epistemological foundations are grounded in Kantian philosophy [1755–1788], particularly in the need to reflect on how we acquire knowledge, especially regarding the perception of the world based on the understanding of natural phenomena. This epistemological perspective is essential for justifying fieldwork as a “laboratory of thought,” in which the perception of natural phenomena is mediated by theoretical categories that constitute the foundations of Physical Geography: geomorphological (CAILLEUX; TRICART, 1956; DACKOMBE; GARDINER, 2020), geosystemic (BERTRAND, 1968), geocological (RODRIGUEZ; SILVA; CAVALCANTI, 2013), and landscape cartography (CAVALCANTI, 2014), which are used to describe, explain, and classify morphologies and processes in landscapes. The review protocol followed four structural stages: identification, screening, eligibility, and inclusion (Table 1).

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Component	Details	
Database	Scopus (Elsevier)	CAPES Journals Portal
Search strings	"Fieldwork" AND "Physical Geography"	"Trabalho de campo" AND "Geografia Física"
Time frame	1981–2023	2001–2024
Results	83 Articles	101 Articles
Initial article filters	Peer-reviewed	
	Open access	
	Languages: Portuguese, English, and Spanish	
Inclusion criteria	Articles discussing fieldwork in Physical Geography	
Screening stages	Reading of titles and abstracts	
	Full-text reading with extraction of key concepts	
	Quantitative assessment of articles by application area	

Table 1 – Search protocol and selection criteria. Source: Prepared by the authors (2026).

FIELDWORK IN PHYSICAL GEOGRAPHY: MEANINGS AND RELATIONSHIPS

In Physical Geography, the challenge arises of proposing guidelines for fieldwork that incorporate procedures used in Geology, Geomorphology, Climatology, Pedology, Hydrography, and Biogeography, each of which has its own research methodologies that shape how researchers think and act (CHRISTOPHERSON; BIRKELAND, 2017; PRESS et al., 2006). Therefore, a focus on spatial coherence and integrity is necessary, particularly in Physical Geography.

The review identified 184 studies on fieldwork across different applications, including 83 in Scopus (Elsevier) (Figure 1A) and 101 in the CAPES Journals Portal (Figure 1B). Of these, 57 report the importance of fieldwork in Geography education, both as applied research for teacher training and as a curricular activity in basic education (PRASKIEVICZ, 2023; AFONSO; SILVA; COSTA, 2019; LOUZADA; FROTA FILHO, 2017).

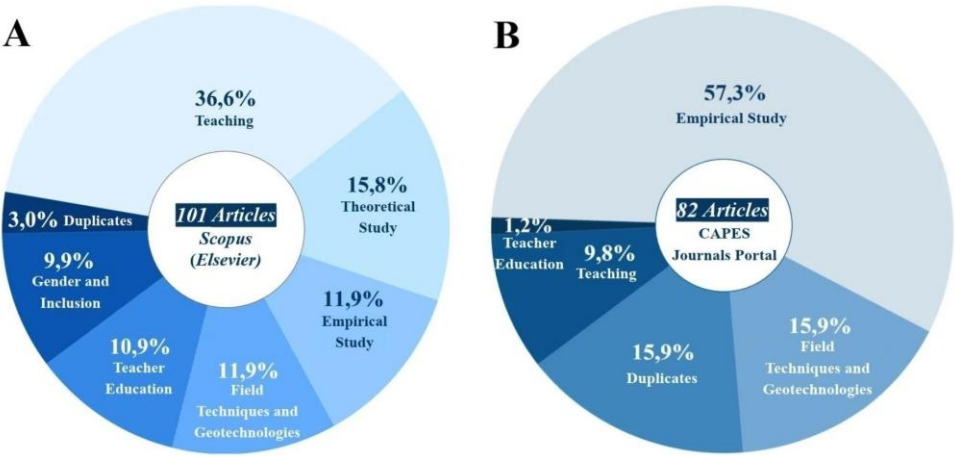


Figure 1 – Number of studies by database. A – Scopus (Elsevier) and B – CAPES Journals Portal. Source: Prepared by the authors (2026).

The review made it possible to identify multiple approaches to fieldwork in Physical Geography. On the one hand, 10 studies addressed gender, sexuality, and mobility inclusion (ROSE, 2022; ZEBRACKI; GREATTRICK, 2022); on the other, 16 studies examined the epistemological discourse on the role of fieldwork following the period of the New Geography (CALBÉRAC, 2015).

In Physical Geography, 59 empirical studies were identified that use fieldwork as a stage of the research process. These studies present one-sided descriptions of an area within Physical Geography or specific field guides for study sites (FREITAS JÚNIOR, 2011; SANCHES, 2012). In addition, geotechnologies have been used as pedagogical tools for data collection, based on experiences in higher education (PANEK et al., 2023).

The review revealed that none of the studies analyzed aligns with this proposal, highlighting a gap: the absence of a cognitive foundation for conducting fieldwork in Physical Geography. To address this gap, a Kantian reflection is adopted: how do we structure our reasoning to understand phenomena in the real world?

For example, at the beginning of a Geography degree program, students learn that all elements of the Earth's surface constitute Geographic Space (STRAHLER; STRAHLER, 2005), making the field of study broad and initially complex. When encountering an outcrop, for instance, their task is to transform landscape observation into data and descriptions within Physical Geography. This approach can be understood by analogy with a medical protocol, in which, following an initial medical history, a detailed examination is performed to identify patterns and, if necessary, specific laboratory analyses are requested to further investigate the diagnosis.

Field research in Physical Geography should follow the same premise: a geographical history-taking of the landscape. Appropriate guidance is essential for determining how to perceive the reality of the elements that make up the landscape at the site being visited. This requires an exercise in conceptual complexity, involving the perception of each landscape element in itself, as well as an operational exercise focused on the concrete (inter)relationships among each topic and the different components identified within Physical Geography.

Unlike other sciences, in which research is conducted in offices or laboratories, Physical Geography requires fieldwork to provide direct access to the object of study. In the face of various challenges, it is essential not only to be in the field but also to interpret the landscape in an organized manner consistent with the relevant concepts. To this end, following a specific theoretical-methodological protocol is fundamental.

SYSTEMATIZATION OF THE RESULTS

Fieldwork can be divided into two types: exploratory reconnaissance and specific data collection. The former employs the rapid method (from the Latin *expeditus*), which seeks to address tasks and problems efficiently. It begins with thorough theoretical and operational planning of the activity, including readings on the area and the variables to be identified and analyzed, thereby building a solid understanding of the concepts. The formative processes of the landscape leave traces and signatures that reveal genesis and changes; therefore, it is simply a matter of knowing how to access this information.

In contrast, fieldwork aimed at collecting specific data is conducted when a certain level of knowledge about the area has already been acquired. It involves procedures such as observation, description, water collection, soil, sediment, and vegetation sampling, the use of traps for animals and insects, precision topographic measurements using RTK (Real-Time Kinematic), total stations, compasses for describing geological attitude, descriptions of transects or sampling polygons, and so forth.

In both cases, efficiency requires knowledge and categorical information, forming a cognitive structure concerning the composition and processes of the landscape. To this end, this study adopts the thesis that Geography is a way of thinking about the world (GOMES, 2022); therefore, it is necessary to organize the practical implementation of this principle for fieldwork.

Thus, the collection of initial data and information and/or the recognition of ground truth in Physical Geography can be systematized into six geographical axioms, which correspond to principles

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for reading the natural landscape and are regarded in this proposal as interpretive keys that guide the theoretical-methodological protocol for fieldwork in Physical Geography: knowing how to locate oneself and orient oneself; being able to identify and describe morphologies and their spatial characteristics; understanding the effects of spatiotemporal influences on the landscape; identifying sites of origin and dispersal; classifying types of structures and processes; and recognizing systemic relationships.

KNOWING HOW TO LOCATE AND ORIENT ONESELF

Every science has principles specific to its field. In Geography, location is an essential premise (MORAES, 2005) and can be established in three ways: through the toponymy of places; based on a theme (for example, relief compartments, climatic zones, vegetation types, among others); and through geographic coordinates. Clearly, using one type does not invalidate the others.

Technological advances and the widespread adoption of digital tools, such as the Global Navigation Satellite System (GNSS) and smartphones, have facilitated access to unfamiliar areas. However, studying the toponymy of the study area is recommended to become familiar with localities, including geographical features and communities, thereby enabling the establishment of unfamiliar routes and the creation of routes to reach the intended point.

The purpose of location is, above all, to know how to orient oneself (North, South, East, and West) within the study area, defining movement patterns for data collection according to a spatial logic related to the arrangement of landscape elements. Before conducting fieldwork, it is essential to define points of interest, map primary and alternative routes, and select the best positions (orientations) from which to observe the phenomena under study.

To convert the visible aesthetic qualities of nature into forms, composition, and processes enriched with scientific information, procedures must be established for data acquisition, which initially depends on geographic information comprising coordinate pairs, altitude, and orientation to establish spatial reference points.

In the field, transect surveys are an established procedure based on observation along a linear path, highlighting the relationship between space and phenomena while following a defined position (TIXIER, 2016). The process begins with the construction of a topographic profile using radar-derived elevation data, followed by the definition of control points within geological/geomorphological units, profile smoothing, and the addition of thematic information (MOURA et al., 2022).

When planned in advance and used as a procedure for assessing the conditions of the study area, the transect makes it possible to clarify the spatial succession of landforms, as well as potential spatial changes in the object of study (AB'SÁBER, 2010). The prior definition of transect paths, combined with theoretical analysis, facilitates the identification of the systems operating in the landscape, while also improving the researcher's orientation and spatial perception.

ABILITY TO IDENTIFY AND DESCRIBE MORPHOLOGIES AND THEIR SPATIAL CHARACTERISTICS

Morphology, as a product of the ongoing and successive transformation of the landscape, enables the apprehension of the external organic whole of form, according to Johann W. V. Goethe (1949–1832), while phenomena invisible to sight must also be considered as complementary elements (ARRAES, 2018).

The essence of the morphological approach lies not only in describing the tangible, but also in examining the relationships among spatial phenomena in their physical, biological, and noetic dimensions. This systemic perspective focuses on relationships rather than merely cataloging territorial configurations, seeking to discover the spatial order within the multiplicity of landscape phenomena and relationships (MACIEL, 2009).

Observing, identifying, and discerning the set of forms and processes within the landscape is an ongoing exercise when conducting fieldwork in the presence of the object of study. Therefore, to understand the multiple relationships among these elements, it is necessary to understand how each

natural component—geology, geomorphology, climate, soils, among others—is expressed in the morphology of the landscape.

Lithology constitutes the structural basis of morphologies. Rock outcrops serve as intuitive indicators of geological units with discontinuous spatial distribution at the surface. For example, when exposed at the surface as inselbergs, they stand out in the landscape, as in the case of the Dona Inês Intrusive Suite (eastern Northeast Brazil) or the Santa Angélica Supersuite/Castelo Suite (Espírito Santo, southeastern Brazil) (CPRM, 2004). Furthermore, the alignment and incision of drainage channels may indicate the direction of a shear zone, where slopes follow recurring orientations.

Attention should also be paid in the field to landforms controlled by major geological structures (PENTEADO, 1983). In these settings, differences in the landscape are pronounced and often visible only at the regional scale through remote sensing products. What is visible constitutes the cumulative outcome of endogenic and exogenic morphogenetic processes, whose signatures can be identified through recurring landforms across the terrain.

Identifying climatic signatures requires analyzing the characteristics of the weathering mantle. In relatively flat terrain, a detrital pavement indicates predominantly semiarid conditions; conversely, when these mantles are thick and the underlying basement consists of crystalline rocks, this indicates higher precipitation volumes distributed more evenly throughout the year. Climate controls weathering, erosion, and sedimentation; consequently, landforms tend toward a state of equilibrium (TUCKER; HANCOCK, 2010), accompanied by adaptations in plant and animal species and associated biogeographical implications. Road cuts facilitate the analysis of weathering mantles, while climographs help explain the distribution of temperature and humidity throughout the year, enabling the interpretation of elements encountered in the field.

When the objective is a more detailed soil assessment, including the characterization of the profile, the thickness and depth of horizons, color, texture, structure, consistency, and transitions between horizons, the technical manual of pedology can be used (IBGE, 2015). It provides comprehensive guidelines, a list of required materials, and a reference form to support detailed soil description in the field.

Vegetation varies in morphology and density according to relief—such as on fluvial plains, along slopes, and on mountain summits—and in response to pedological controls, with abrupt changes in stature and diversity. For example, in the Caatinga biome, the extent of riparian forest across river floodplains reflects the spatial distribution of fluvial plains, often indicated by the presence of the carnauba palm (*Copernicia prunifera*). In the field, the dominant vegetation type, the most common species, the approximate age of the plant community, and possible indicators of disturbance in the surrounding area should be observed (HUPI et al., 2005).

Morphologies vary while simultaneously indicating the composition and controls of the landscape. By establishing a sequence for observing and analyzing its constituent elements, the puzzle of the natural structure begins to be unraveled. Although these elements are distinct, they maintain a certain degree of interdependence. The distribution, location, and extent of phenomena, together with natural forms, enable a systemic view (VITTE; SILVEIRA, 2010), that is, an understanding of these phenomena in their spatial extent.

UNDERSTANDING THE EFFECTS OF SPATIOTEMPORAL INFLUENCES ON THE LANDSCAPE

The landscape, with its biotic, abiotic, and social elements, results from physiographic, ecosystemic, and territorial processes occurring over time (BERTRAND, 1968) within a given portion of the Earth's surface; in other words, it is a legacy (AB'SÁBER, 2003). Its materialization reflects the superposition of different time intervals across multiple spatial scales.

It results from climatic cycles and tectonic processes that are continuously occurring, leaving distinct traces over time intervals exceeding 100 years. These traces reveal the effects of social interventions on the surface structure of the landscape, which is particularly sensitive to such interventions, especially in the context of natural disasters that have repercussions for vulnerable populations.

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To understand landscape changes, the spatial distribution of its elements and the triggers of its dynamics are mapped. The environmental cycles that shape the landscape include glacial, orbital, and tectonic processes, with timescales ranging from 107 to 10⁻¹ years (ADAMS; MASLIN; THOMAS, 1999; AMORIM; CORRÊA; SILVA, 2016).

Over millions of years, continental transformations result from the interaction between tectonic stresses and planation cycles, forming geomorphological regions. Orogeny and isostasy uplift and stabilize the crust, while denudation, influenced by base level and climatic cycles, removes weathering mantles, exposing the roots of ancient Proterozoic mountain ranges. This reveals shear zones, lineaments, and arcs associated with accretionary plutonic and volcanic magmatism, enabling the historical reconstruction of the processes that shape the present-day landscape.

At timescales shorter than one hundred thousand years, landforms emerge under the influence of climate change and Quaternary neotectonic structures. Each landscape element persists because the processes transforming it have not yet completed their action. For example, a field of active dunes depends on a continuous sediment supply; without this replenishment, its characteristic forms tend to be completely eroded.

At even shorter intervals, such as annual timescales, variations in the tilt of the Earth's axis produce dry and rainy periods that influence the landscape. This is reflected in the vegetation physiognomy of the Caatinga, with periods of maximum exuberance, when greenery reappears in the tree canopies, and another period of aestivation, when leaf loss gives rise to dry forest (AB'SÁBER, 2003).

In this respect, it is possible to distinguish the imprints of spatiotemporal influences on the landscape, whether of geological origin or resulting from seasonal changes. Furthermore, attention must be paid to the causes and effects of anthropogenic influences on the configuration of the social landscape and their relationship with stochastic events (earthquakes, floods, inundations, landslides, etc.) perceptible at the human timescale.

IDENTIFYING SITES OF ORIGIN AND DISPERSAL

The landscape is the living and most tangible expression of the complexity of natural spheres. This point is emphasized to clarify that its elements, whether considered individually or as integrated components, have a genesis and are also subject to processes connected through dispersal events—processes that must remain within the geographer's field of attention during fieldwork.

Consider the behavior of landforms. A fundamental element in understanding erosional landforms is the presence of correlated deposits. In other words, if we observe landforms such as inselbergs today and know that their genesis is related to magma that cooled within the Earth's crust (MIGON, 2004), then all the material that once covered the present-day surface must have been eroded and deposited somewhere, giving rise to other landforms of depositional origin.

In Biogeography, the refugia theory links climatic fluctuations to the distribution of phytogeographical refuges during the Quaternary. Ab'Sáber (1992) suggests that, during the maximum retreat of tropical forests, certain areas retained favorable environmental conditions, functioning as ecological refuges, such as the “brejos de altitude” (high-altitude humid forests) of northeastern Brazil. However, tectonic and geomorphological factors are also considered in explaining the origin and dispersal of these areas, as in the Amazon (HAFFER; PRANCE, 2002).

Accordingly, the phenomenon of desertification, which occurs within restricted areas of arid, semiarid, and dry subhumid ecozones under degrading human influence, can be interpreted through this axiom. Given the nature of the process, an area forming a desertification nucleus—the most advanced stage of the phenomenon—can expand into surrounding areas (VASCONCELOS SOBRINHO, 1978), even if its genesis initially occurs at a specific location within a given territory.

Given the complexity of this phenomenon, its genesis may vary from one location to another. Nevertheless, its occurrence is notably triggered by advanced land degradation, closely associated with anthropogenic activities (removal of native vegetation, improper land use, deforestation, and burning, etc.) (NASCIMENTO, 2023). As a result of these factors and the susceptibility of surrounding areas, the process may spread, leading to the dispersal of desertification across the landscape.

This is evidenced by the existence of eight desertification nuclei in the Brazilian semiarid region. Since the late 1970s, only four were initially identified: Gilbués in Piauí, Irauçuba in Ceará, Seridó on the border between Rio Grande do Norte and Paraíba, and Cabrobó in Pernambuco (BRASIL, 1998). Subsequently, the areas of Sertão de São Francisco in Bahia, Cariris Velhos in Paraíba, and Inhamuns and Médio Jaguaribe in Ceará were included (ALBUQUERQUE et al., 2020).

These cases demonstrate that natural events and processes develop spatially. Therefore, the other factors governing landscape formation must be clearly understood to investigate the origin of the forms, objects, and processes observed and determine whether they exhibit dispersal. This, in turn, is an exercise that extends beyond what is visible in the field.

CLASSIFYING TYPES OF STRUCTURES AND PROCESSES

Reading the landscape requires researchers to organize the structures and processes of the physical environment, beginning with the definition of morphologies, spatial characteristics, and classification criteria. Between 1955 and 1970, studies focused on structural-morphological analysis at regional and local scales, prioritizing the taxonomic classification and mapping of units (ROUGERIE; BEROUCHATCHVILI, 1991).

Structures or morphologies are understood as the set of forms found in the landscape that represent signatures of processes of various kinds: steep slopes, extensive plains, and flat summits are used in Geomorphology; lineaments, fault orientations, and outcrops are applied in Geology; phytophysognomic formations, such as campo sujo (shrubby grassland), campo limpo (open grassland), and campo rupestre (rocky grassland), fall within the field of Biogeography; color, texture, horizon thickness, and depth are among the diagnostic elements used for soil classification in the field; and bedrock channels, knickpoints, and meandering or anastomosing channels are landforms used in description and mapping for hydrographic analyses.

All these morphologies are products of past and present processes acting on the landscape. They can be understood as signatures, fingerprints, or traces left by endogenic and exogenic agents, which can be grouped and classified into typologies through the application of knowledge. The recurrence of forms along a route indicates that the area belongs to a relief compartment, biogeographical region, or landscape unit. Various terms distinguish these natural compartments, such as “minibiomes,” proposed by Ab’Sáber (2006), which reflect geoecological interactions within the same climatic and geological domain.

In the field, it is essential to recognize that the landscape consists of groups of morphologies reflecting geological, climatic and paleoclimatic, geomorphological, pedological, hydrographic, biogeographical, and social processes. Accordingly, researchers should seek to understand which process is or was responsible for the structure being described; that is, its origin.

IDENTIFYING SYSTEMIC RELATIONSHIPS

A geomorphological feature, a soil class, a section of a drainage channel, or an ecological unit results from multiple dynamics. Therefore, recognizing systemic configurations and connections requires, above all, acknowledging that nature consists of complex systems whose relationships are, for the most part, non-univocal. Understanding the multiple factors that shape the landscape was already part of this approach when Davis, in explaining the “geographical cycle,” showed that relief is a function of three quantitative variables: structure, process, and time (AMORIM; CORRÊA; SILVA, 2016).

The preceding sections addressed the aspects necessary to establish a line of reasoning capable of interpreting the reality encountered by researchers in the field. Following these steps, the complexity of the analysis must be expanded by examining facts in light of systemic interactions, that is, as a cohesive set of elements that connect, complement one another, and form a unit: the whole, its parts, and their interrelationships through exchanges of matter and energy, rather than a mere superposition of elements (MATTOS; PEREZ FILHO, 2004). Likewise, the whole cannot be fully understood without knowledge of its parts and their interconnections.

The logic underlying this axiom is to identify the factors and processes that acted to shape the landscape structure within a given area. If, in a humid climate where a thick weathering mantle would be

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expected, shallow soils and outcrops predominate, the slope position probably favors morphogenetic processes, with the continuous removal of weathered material. In this case, researchers should seek to identify a colluvial deposit at the foot of the slope; if none is present, they should investigate which mechanism transported the material out of the slope system.

In the field, one way to establish these relationships is to list all landscape elements and connect them with lines indicating their influence relationships, gradually developing a more complex explanatory model capable of accounting for the systemic relationships of the observed reality.

In summary, the approach can be understood as a three-level cognitive model, with fieldwork at its center as the main objective. It is surrounded by six axioms that guide its implementation. The next level comprises the facts and phenomena encountered in the landscape, as well as elements that help systematize data collection (Figure 2).

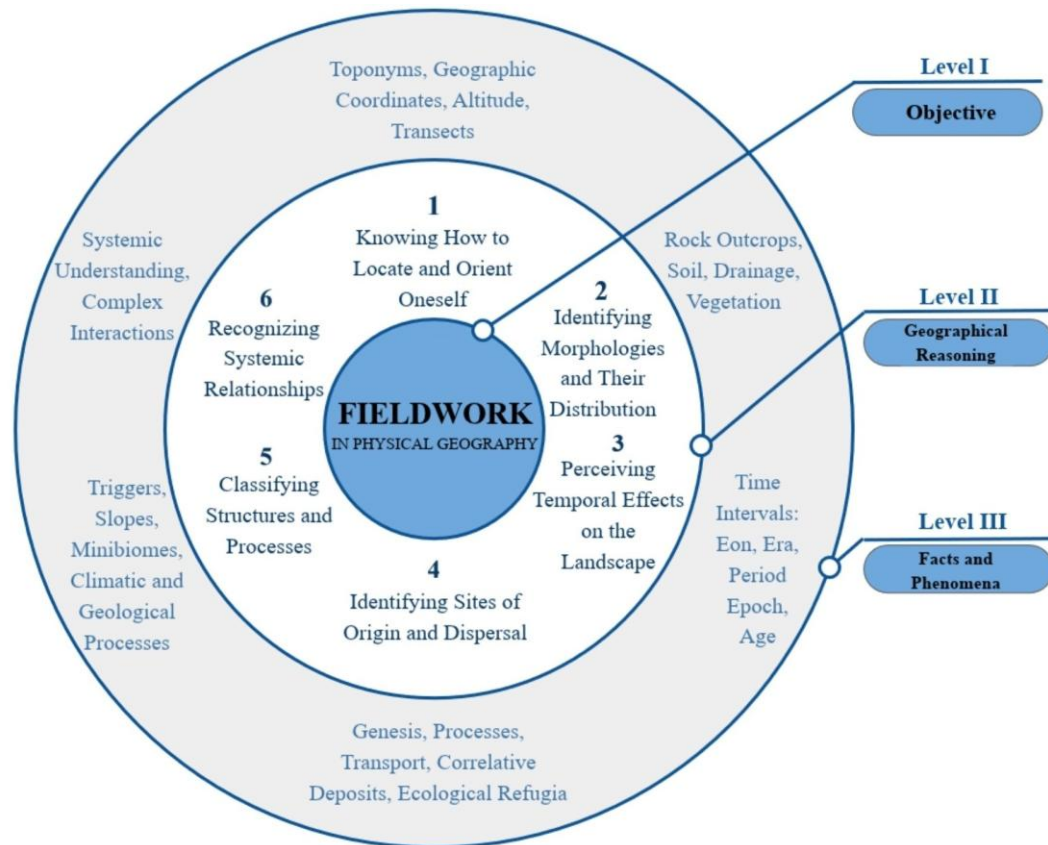


Figure 2 – Illustrative synthesis of the axioms. Source: Prepared by the authors (2024).

CONCLUSION

The aim was to develop a way of conceptualizing field research in Physical Geography, grounded in the convergence between Kantian epistemology and geographical approaches to identifying the aspects that make up the landscape. As demonstrated by the review, there is methodological fragmentation and a lack of protocols connecting theoretical abstraction with the facts and phenomena of the real world as expressed in the landscape.

Rather than a rigid formula, the systematization of the six axioms functions as an “intelligible radar” for geographers, enabling them to abstract reality in the field through concepts that give meaning to descriptions and data collection. At the same time, like any general theoretical proposition, this model has limitations, since it does not aim to address all conceptual and methodological shortcomings of fieldwork in Physical Geography or its subfields. Furthermore, although this research was restricted to

articles from specific databases, the list of references presented here provides guidance for further exploration of different approaches.

In short, the effectiveness of this proposal depends on researchers' ability to adjust the scale of analysis, theoretical foundation, and complexity of the axioms to their object of study. This systematization is expected to reduce unsystematic subjectivity in the field, enabling Brazilian Physical Geography to advance toward more methodologically rigorous data production.

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DATA AVAILABILITY

Not applicable.

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