

Review article

Bringing Geographies of Knowledge out of the Shadows? An Analysis of Geography Research Groups in Brazil

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Abstract

This article presents a critical analysis of Geography research groups in Brazil, drawing on data from the CNPq Directory of Research Groups and situating these collectives within international debates on geographies of knowledge, in dialogue with postcolonial and decolonial approaches. It examines the spatial distribution, temporal evolution, thematic organization and internal structure of 616 research groups active in 2023, seeking to show how these collectives function as sites of production, contestation and legitimization of scientific knowledge. The results reveal a substantial growth of these groups over the last two decades, with particular emphasis on the centrality of Human Geography and Geography Education, as well as their concentration in institutions located in the South and Southeast regions of the country. The article concludes that these groups operate simultaneously as local, regional and national networks, while also seeking territorially embedded articulations with global logics of scientific recognition. Taken together, the analysis offers an unprecedented empirical and theoretical systematization of geographies of knowledge from the Brazilian case and opens space for dialogues on geographies of knowledge originating in the Global South.

Keywords: Geographies of Knowledge; Research Groups; Global South.

1. Introduction

Scientific knowledge has become increasingly global over recent decades, yet its production remains profoundly uneven across places, institutions and regions. Rather than reducing geographical disparities, the internationalization of research has often reinforced longstanding differences in visibility, influence and the capacity to shape scientific agendas. Contemporary debates in the Geographies of Knowledge therefore extend well beyond questions of where science is produced, focusing instead on how institutional arrangements, territorial contexts and unequal opportunities continue to structure the production, circulation and recognition of knowledge (Demeter, [2022](#); Miao *et al.*, [2022](#); Guzman-Valenzuela *et al.*, [2023](#); Nakamura *et al.*, [2023](#); De-Marcos *et al.*, [2024](#); Chann, [2024](#); Hammett *et al.*, [2024](#); Mazzega *et al.*, [2025](#); Liu & Daud, [2025](#)).

Recent research has considerably advanced this discussion. Studies of editorial governance, collaboration networks, research funding and academic mobility consistently show that participation in international science is shaped by far more than scientific productivity alone. Institutional prestige, access to collaborative networks and unequal opportunities for visibility remain decisive in determining whose knowledge gains broader recognition. At the same time, the Global South is no longer understood simply as a homogeneous scientific periphery. Growing evidence points instead to marked differences in research capacity, infrastructure and international integration, not only between Northern and Southern countries but also within national scientific systems themselves (Guzman-Valenzuela *et al.*, [2023](#); Chann, [2024](#); Hammett *et al.*, [2024](#); Müller *et al.*, [2025](#); Mazzega *et al.*, [2025](#)).

Although these studies have substantially improved our understanding of the geography of scientific production, they have concentrated primarily on its most visible expressions, including publications, citations, collaboration networks and editorial structures. Considerably less attention has been devoted to the institutional environments through which these outcomes are collectively produced. How research agendas are organized, collaborative capacities are built and scientific authority emerges within particular organizational settings remains comparatively less understood. This limitation is especially relevant in countries where research groups constitute one of the principal institutional structures supporting research, postgraduate education and scientific collaboration.

Brazil provides a particularly valuable setting in which to examine these questions. As one of the largest scientific systems in the Global South and the largest producer of indexed scientific publications in Latin America, the country combines an extensive research infrastructure with persistent territorial, institutional and disciplinary inequalities. Scientific expansion has therefore occurred alongside pronounced regional differences in research capacity, making Brazil an



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especially appropriate context for investigating how scientific production is territorially organized within a national scientific system (National Center for Science and Engineering Statistics, [2022](#); Reyes & Lamego, [2022](#); Mazzega *et al.*, [2025](#)).

Within this context, Geography research groups offer a particularly revealing analytical perspective. More than administrative units, they are collective environments in which research agendas are defined, collaborations are consolidated and new generations of researchers are trained. Their territorial distribution provides a unique opportunity to examine how scientific capacity is organized across space and how internal centres and peripheries emerge within one of the largest geographical communities of the Global South.

This article examines the temporal evolution, spatial distribution and thematic organization of Geography research groups in Brazil. Rather than treating these groups simply as descriptive statistical units, it interprets them as multiscalar territorial infrastructures through which knowledge production is collectively organized. By focusing on the institutional environments that make scientific activity possible, the article contributes to contemporary debates on the Geographies of Knowledge while offering a geographical interpretation of how differentiated research capacities and internal scientific inequalities are produced within a major scientific system of the Global South.

2. Review of Literature: Brief Considerations on the Geographies of Knowledge and the Global South

The Geographies of Knowledge have evolved considerably over the past two decades. What initially emerged as a critique of universal and placeless conceptions of science has developed into a broader research agenda concerned with explaining how knowledge production is shaped by unequal institutional capacities, territorial differentiation and asymmetrical relations of scientific authority. Rather than asking simply where science is produced, contemporary debates increasingly examine how research systems, academic institutions and political arrangements influence the production, circulation and recognition of knowledge across multiple geographical scales (Demeter, [2022](#); Miao *et al.*, [2022](#); Guzman-Valenzuela *et al.*, [2023](#); Nakamura *et al.*, [2023](#); De-Marcos *et al.*, [2024](#); Chann, [2024](#); Hammett *et al.*, [2024](#); Zaragocin, [2024](#); Mazzega *et al.*, [2025](#)).

This shift has substantially broadened the analytical horizons of the field. Recent research consistently demonstrates that scientific inequalities cannot be understood through publication output or citation performance alone. Editorial governance, funding systems, institutional prestige, academic mobility and international collaboration have become central explanatory dimensions for understanding why some researchers, institutions and territories enjoy greater scientific visibility and influence than others (Patelli *et al.*, [2023](#); De-Marcos *et al.*, [2024](#); McManus *et al.*, [2023](#), [2024](#); Lagisz *et al.*, [2024](#)). At the same time, the Global South has come to be understood less as a coherent scientific periphery than as a highly differentiated geographical space characterized by marked variations in institutional capacity, research infrastructure, disciplinary specialization and international integration (Guzman-Valenzuela *et al.*, [2023](#); Hammett *et al.*, [2024](#); Liu & Daud, [2025](#); Mazzega *et al.*, [2025](#)). Scientific inequalities therefore operate simultaneously across global, national and regional scales, producing differentiated centres and peripheries both between countries and within national research systems.

A second important development concerns the growing emphasis placed on relational approaches to scientific production. Contemporary science increasingly operates through multiscalar networks connecting researchers, universities and research institutions across national boundaries, yet these expanding connections have not eliminated geographical inequalities. Instead, they often reproduce highly selective patterns of collaboration, visibility and influence, reinforcing existing asymmetries while simultaneously creating new forms of institutional differentiation (Aksnes & Sivertsen, [2023](#); Isfandyari-Moghaddam *et al.*, [2023](#); Farias Borges *et al.*, [2025](#)). Internationalization, therefore, should not be interpreted as evidence of a progressively homogeneous scientific system but rather as a process through which new geographies of scientific authority are continuously produced.

Taken together, these contributions have profoundly transformed current understandings of the geography of science. Nevertheless, they also reveal an important analytical limitation. Most recent studies concentrate on the visible manifestations of scientific activity—publications, citations, editorial boards, collaboration networks and research performance. These indicators have greatly improved our understanding of how knowledge circulates and how scientific inequalities become internationally visible. They provide a sophisticated picture of the geography of scientific outputs. Comparatively less attention, however, has been devoted to the organizational environments through which these outcomes become possible. Consequently, contemporary scholarship

explains increasingly well how knowledge circulates while offering fewer explanations of how the institutional conditions that sustain scientific production are themselves territorially organized.

This distinction is more than methodological; it is fundamentally conceptual. Scientific outputs represent the observable expressions of research activity, whereas the institutional environments that make these outputs possible remain comparatively less explored. Understanding how scientific authority is produced therefore requires examining the collective settings in which research agendas are negotiated, collaborations are established, resources are mobilized and new generations of researchers are trained. From this perspective, research groups become analytically significant not because they constitute another empirical object, but because they provide access to the territorial organization of scientific practice itself.

Addressing this question requires returning to the conceptual foundations upon which the Geographies of Knowledge were originally established. Foundational scholarship demonstrated that scientific knowledge is never detached from the places in which it is produced. Rather, research practices are embedded within particular historical, institutional and geographical contexts, making laboratories, universities and scientific communities active participants in the production, circulation and validation of knowledge (Thrift, 1985; Livingstone, 1995, 2003; Meusbürger *et al.*, 2010). These contributions remain essential not because they describe the contemporary organization of global science, but because they provide the conceptual language through which current debates on scientific inequalities, territorial differentiation and epistemic authority continue to be interpreted.

Seen from this perspective, science appears not as the cumulative production of universal truths but as a socially and geographically situated practice. Laboratories, universities, research institutes and academic communities do more than host scientific activity; they shape research agendas, structure opportunities for collaboration and participate in the construction of scholarly legitimacy (Livingstone, 2003). Scientific knowledge is therefore produced through spatially differentiated institutional environments operating across multiple scales rather than within abstract or placeless scientific communities (Livingstone, 1995; Meusbürger *et al.*, 2010). This interpretation provides a particularly productive framework for understanding research groups as places where scientific practices are collectively organized and territorially differentiated.

A complementary perspective is offered by Bourdieu's (2001) conception of science as a relatively autonomous social field structured by struggles over authority, prestige and legitimacy. Scientific production depends not only on intellectual capacity but also on unequal access to scientific and symbolic capital, institutional resources and collaborative opportunities. Differences in scientific visibility therefore cannot be reduced to productivity alone; they also reflect the unequal positions occupied by researchers and institutions within the scientific field. Research groups may be understood as one of the institutional environments through which these resources are assembled, scientific trajectories are consolidated and scholarly recognition is progressively accumulated.

Within this broader conceptual framework, research groups emerge as one of the central organizational environments through which contemporary science is reproduced. They provide the institutional settings in which research agendas are collectively constructed, collaborations are stabilized, postgraduate education is organized and scientific communities are continuously renewed. In Brazil, they also represent a strategic component of the national research system, linking universities, graduate programmes and public research funding (Reyes & Lamego, 2021; Reyes & Lamego, 2022). Although widely recognized as fundamental components of scientific organization, research groups have received comparatively less attention as territorial infrastructures through which differentiated capacities for knowledge production are produced and reproduced within national scientific systems.

Building upon these debates, this article proposes a different analytical perspective. Rather than approaching research groups simply as administrative entities or descriptive statistical units, it conceptualizes them as multiscalar territorial infrastructures of knowledge production through which scientific practices are collectively organized and differentiated institutional capacities emerge. The Brazilian geographical community is therefore examined not merely as a national case study but as an empirical laboratory for understanding how internal centres and peripheries are constituted within one of the largest scientific systems of the Global South. By shifting the analytical focus from the geography of scientific outputs towards the territorial organization of the institutional environments that make scientific production possible, the article advances contemporary debates on the Geographies of Knowledge while contributing to a broader interpretation of how scientific inequalities are organized, reproduced and transformed across multiple geographical scales.

3. Methods

3.1. Research Groups as Places of Knowledge

From the perspective of the Geographies of Knowledge, research groups can be understood as places of knowledge, that is, as institutional settings in which scientific practices are organized and knowledge is produced, circulated and legitimized (Livingstone, 1995, 2003; Meusburger *et al.*, 2010). Beyond their administrative functions, they constitute spaces of collaboration, training and scientific production, while simultaneously operating as arenas of competition for authority and legitimacy within the scientific field (Bourdieu, 2001). Research groups are therefore approached here as strategic infrastructures through which the unequal geographies of science and the production of knowledge in the Global South can be examined.

Approaching research groups as places of knowledge, this section presents a set of general considerations organized into five theoretical dimensions: (i) materiality and infrastructure; (ii) their constitution as epistemic cores; (iii) their role in the training of new researchers; (iv) their articulation across multiple scales and networks; and (v) their symbolic dimension as arenas of struggle over scientific authority. Through these lenses, we argue that research groups not only inscribe themselves geographically within the existing scientific structure, but also act as active agents of transformation and as strategic sites for understanding the unequal geographies of science and the global distribution of knowledge.

3.2. Research Groups as Material and Infrastructural Sites of Science

Research groups are, first and foremost, concrete physical places, situated in specific territories and anchored in particular institutions. They are geographical spaces with extent, location, and materiality, hosting scientific practices and technical artifacts in highly diverse arrangements, ranging from modest rooms furnished with tables, chairs and bookcases to highly sophisticated laboratories equipped with cutting-edge technologies and substantial budgets. What characterizes them, therefore, is not only their formal or administrative existence, but the ways in which they are materialized, sustained and reproduced in logistical and infrastructural terms

Beyond their physical form, these groups function as nodes of concentrated resources: salaries, research grants, equipment, consumables, databases, specialized software and other devices that make scientific activity possible. The density and sophistication of this infrastructure not only express but also reinforce unequal circuits of funding, recognition and prestige within the scientific system.

In many national contexts, including Brazil, a research group acquires full effectiveness and institutional visibility when it is officially certified by state bodies and becomes eligible to compete for funding through calls issued by research agencies and public or private institutional partnerships. Under these conditions, it ceases to be merely a site of intellectual work and is affirmed as an active unit within science and technology policies, intervening in institutional agendas and strategies for scientific development. A research group is thus simultaneously a space of knowledge production and a spatial and institutional agent of science, whose material conditions both shape and are shaped by the concrete possibilities of conducting research.

3.3. Research Groups as Epistemic Nuclei

Beyond their materiality, research groups operate as nuclei for the organization of scientific thought, structuring themselves around themes, problems, concepts and theoretical approaches that guide investigative practice. Within these spaces, research agendas are formulated, objects of study are defined, and vocabularies and interpretive matrices are stabilized, thereby constituting epistemic communities that share worldviews and strategies for intervening in the world

This internal structuring, although plural and often heterogeneous, enables research groups to function as platforms for the consolidation of disciplinary subfields. By organizing their activities into thematic lines, they contribute to scientific specialization, theoretical and methodological consolidation, and intellectual innovation. In many cases, they become national or international reference points in specific areas, influencing collaboration networks, publication circuits, academic curricula and even public policies.

At the same time, research groups operate as sites of mediation between scientific traditions, fostering dialogue across perspectives, the circulation of ideas and the formation of schools of thought. More than merely executing projects, they are actors in the construction and reconfiguration of disciplinary fields and are fundamental to understanding processes of intellectual segmentation in specific territories. All of this, however, is always relational: the epistemic density of a group depends on its position vis-à-vis other research collectives at different scales, on the

flows of public and private funding, and on the place occupied by its researchers within their respective university systems.

3.4. Research Groups, Their Scales and Differentiated Positions Within the Scientific System

Research groups do not operate as isolated entities; rather, they are embedded in networks that connect local, national and international scales of scientific activity. Their ability to establish collaborations, secure resources and attain visibility varies considerably, generating differentiated positions within the scientific system. While some groups remain strongly dependent upon local institutional settings, others develop broader connections with funding agencies, centres of excellence and international research networks.

From the perspective of the Geographies of Knowledge, this multiscale character reveals that scientific activity is organized through uneven geographies of circulation, connectivity and recognition (Livingstone, 2003; Meusburger *et al.*, 2010). At the same time, these differences reflect the unequal distribution of scientific, institutional and symbolic capital within the scientific field (Bourdieu, 2001). Research groups therefore constitute strategic nodes through which hierarchies, opportunities and asymmetries in knowledge production are continuously produced, reproduced and negotiated across multiple scales.

3.5. Research Groups as Spaces of Training and Socialization

Beyond their role as nuclei of intellectual production, research groups are central sites for scientific training and socialization. Embedded in universities and research centers, they host successive generations of undergraduate and graduate students, as well as postdoctoral researchers and visiting scholars in mobility, operating as key sites for the transmission, updating and re-creation of knowledge, practices and forms of belonging to the scientific field.

Their formative function extends far beyond the mere mastery of theoretical, technical or methodological content. Within these collectives, emerging researchers learn how to think, investigate and communicate science, appropriating conceptual repertoires, specialized languages, writing styles, research procedures and academic norms of conduct. This is a situated learning process in which patterns of recognition and criteria of legitimation specific to particular fields, subfields or disciplinary traditions are internalized. Through this process that some members prepare to occupy positions in other institutions and to structure new groups, thereby contributing to the renewal and expansion of scientific communities.

Research groups also play a decisive role in the construction of scientific and professional identities, traditions and trajectories. By articulating training, supervision, mentoring, support networks and opportunities for integration into research circuits, they operate as platforms for academic projection, directly influencing the professional futures of their members. In contexts marked by the precarization of intellectual labor and the intensification of pressures for productivity, these collectives additionally assume functions of care, resistance and solidarity, configuring dense environments of belonging, continuity and symbolic protection in the face of the uncertainties of the scientific field.

3.6. Research Groups as Symbolic Devices and Fields of Contestation

Beyond their operational and formative functions, research groups also constitute symbolic devices within the scientific field. They concentrate forms of recognition, prestige and intellectual authority and, in doing so, become privileged arenas for the accumulation and reproduction of scientific capital (Bourdieu, 2001). By defining research agendas, legitimizing particular themes and methodologies, and mediating access to scientific networks, research groups contribute to delineating the boundaries of the field and to producing differentiated positions among researchers and institutions.

Consequently, research groups cannot be understood merely as administrative or organizational arrangements. Rather, they are strategic sites in which scientific authority is negotiated and where hierarchies, visibilities and asymmetries are continuously produced, reproduced and contested. Their analysis therefore provides an opportunity to examine the spatial and institutional organization of scientific activity and the uneven geographies of knowledge within the Brazilian scientific system.

On the basis of these premises, the following sections examine the research groups registered in the Directory of Research Groups of the National Council for Scientific and Technological Development (CNPq), the principal institutional instrument for the registration and monitoring of scientific activity in Brazil. As of 2026, the database comprised more than 37,000 active research

groups, of which 616 were classified within the field of Geography. Examining this empirical universe makes it possible to investigate how the Brazilian geographical field is institutionally, thematically and territorially organized and how its internal centres and peripheries are reproduced through the uneven distribution and organization of research groups.

3.7. Research Framework

This study is grounded in a mixed-methods design, descriptive and interpretive in nature, in line with critical and reflexive methodological traditions in Human Geography. The methodological choice rests on the understanding that spatial phenomena cannot be apprehended solely through objective metrics, but require situated interpretations capable of capturing the complexity, historicity and territorial variability of the processes under investigation. The analysis also acknowledges the importance of mobilizing distinct methodological perspectives to enhance analytical depth and address the epistemic diversity that characterizes the geographical field.

At the empirical level, the research draws primarily on data provided by the Directory of Research Groups in Brazil (DGP), managed by the National Council for Scientific and Technological Development (CNPq), which is widely regarded as the principal official instrument for the registration, systematization and monitoring of scientific activity in the country. This institutional database makes it possible to observe, in a structured, open and nationally comprehensive manner, the organizational affiliations, research themes and territorial distribution of certified research groups across Brazil.

Data collection was carried out in April 2026 through direct consultation of the public DGP platform. A clarification is necessary. Two types of data made available by the Directory were used in this study. The first consists of the statistical censuses conducted by the National Council for Scientific and Technological Development (CNPq) and publicly disseminated through the Directory's platform. These censuses are carried out at specific intervals, with the earliest dating from 2000 and the most recent from 2025. They provide general information that is representative of the respective census period. In addition to the census data, the Directory of Research Groups (DGP) platform allows users to conduct targeted searches for individual research groups. This manual data collection was also undertaken for the purposes of this study. Unlike the census data, however, manually collected data are inherently dynamic, since newly created research groups are automatically incorporated into the platform. Likewise, research groups may be removed from the Directory's records due to a lack of updates or other administrative factors. For inclusion and exclusion, the data were thematically disaggregated by broad fields of knowledge, following the taxonomy officially adopted by CNPq. The classification therefore thus followed the established CNPq categories (Human Sciences, Exact and Earth Sciences, Health Sciences, Social Sciences, among others). In the case of Geography, only research groups classified under the broad field "Human Sciences" and, within it, in the "Geography" area of knowledge, that were listed as "certified by the institution" (that is, with an active institutional affiliation) were selected. The analysis considered all groups registered between 2000 and 2026, enabling a longitudinal analysis of the Brazilian scientific system in both quantitative and spatial terms. Non-certified or deactivated groups were excluded.

From the historical series for the broad field of Human Sciences, we extracted a specific subsample comprising all Geography research groups. This final dataset comprises 609 groups active in 2026, whose evolution was examined in detail. The next step consisted of conducting a cartographic analysis of the cumulative distribution of Geography research groups, with the aim of revealing their territorial expansion and regional asymmetries over time. Mapping was carried out using QGIS (version 3.34.9-Prizren), adopting the SIRGAS 2000 projection system (EPSG: 4674). The host institutions of the groups were georeferenced based on their municipal locations, with the SIGLAS/IBGE 2020 system to extract geographic coordinates.

The third methodological stage involved a thematic analysis of the research groups, in order to understand their internal organization in terms of fields and subfields of knowledge. Drawing on self-declared data in the DGP, each group's research lines were systematized and reorganized into classification matrix comprising five broad fields of activity: (a) Human Geography; (b) Physical Geography; (c) Geographical Education; (d) Geotechnologies; and (e) Regional Geography. Each field was then broken down into specific subfields (such as Urban Geography, Climatology, Geocology, Epistemology, among others), according to thematic recurrence and the conceptual coherence of the activities undertaken. Although inspired by conventional divisions within Geography, this classification was constructed inductively, based on empirical evidence drawn directly from the records of the official database. This thematic systematization made it possible not only to produce a more fine-grained interpretation of the epistemological constitution of the groups, but also to identify gaps, overlaps and border zones between disciplinary areas. This

approach that articulates thematic taxonomy with institutional spatiality, thereby enabling reflection on the internal logics that structure the Brazilian geographical field as a network of knowledge production.

The final step consisted of analyzing the gender distribution in group leadership, considering both thematic fields and disciplinary subfields. Data on the leader of each group active in 2026 were extracted from the DGP and classified as male or female, according to self-declaration. On this basis, we constructed a cross-tabulation matrix between gender and thematic area was constructed, allowing the production of descriptive tables and comparative graphs that reveal internal gender asymmetries within the geographical field.

Finally, despite the robustness and broad coverage of the DGP/CNPq, this study acknowledges methodological constraints inherent to the self-declared nature of the database. These may result in some underrepresentation, inconsistencies or outdated information. Moreover, the database does not provide tools for the direct assessment of the groups' overall scientific output (such as articles, books, projects or collaboration networks), and is restricted to institutional and quantitative descriptors. For these reasons, this study concentrates on analyzing of the organizational, territorial and thematic structure of Geography research groups, leaving to future studies a more in-depth exploration of the qualitative dimensions of their production and scientific impact. The overall research framework adopted in this study is presented in Figure 1.

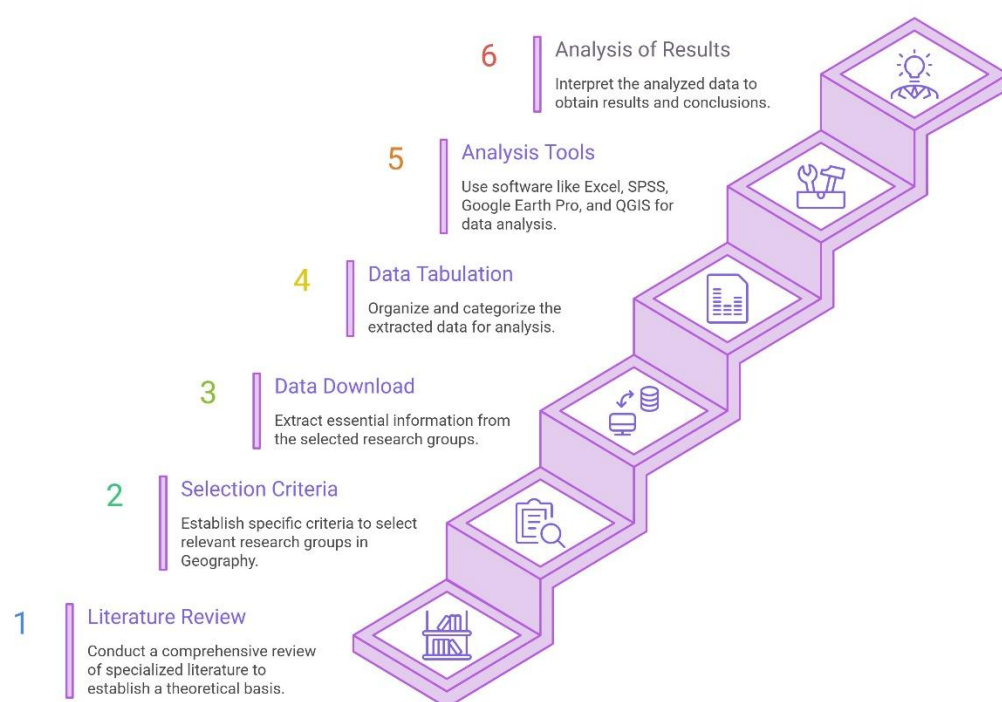


Figure 1. Summary Diagram of the Methodological Stages of the Research.

4. Results

4.1. Research Groups in Brazil

According to the National Council for Scientific and Technological Development (CNPq), research groups are collectives of researchers and students organized around specific lines of inquiry and coordinated by one or two leaders (CNPq, 2026). Over recent decades, they have become one of the principal organizational forms of scientific activity in Brazil and a central mechanism for structuring graduate education and knowledge production.

The consolidation of research groups reflects the broader institutionalization of Brazilian science, driven by the actions of CAPES, CNPq and the National Graduate Plans (PNPG). Since the 1970s, graduate programmes have been encouraged to define areas of concentration and research lines, fostering the organization of scientific activities through formally constituted groups (Vinha, 2015). This process was further reinforced by Resolution No. 5 of 10 March 1983, which established research activities as one of the criteria for the accreditation of *stricto sensu* graduate programmes in Brazil (Brasil, 1983).

A major milestone in this trajectory was the creation of the Directory of Research Groups in Brazil (DGP) in 1992. Maintained by CNPq, the platform constitutes the principal national database for monitoring scientific activities and provides systematic information on the characteristics, composition and evolution of research groups in the country. As such, it offers a valuable instrument for examining the institutional and territorial organization of Brazilian science. The growth of research groups across the different regions of Brazil from 2000 to 2026 is presented in Figure 2.

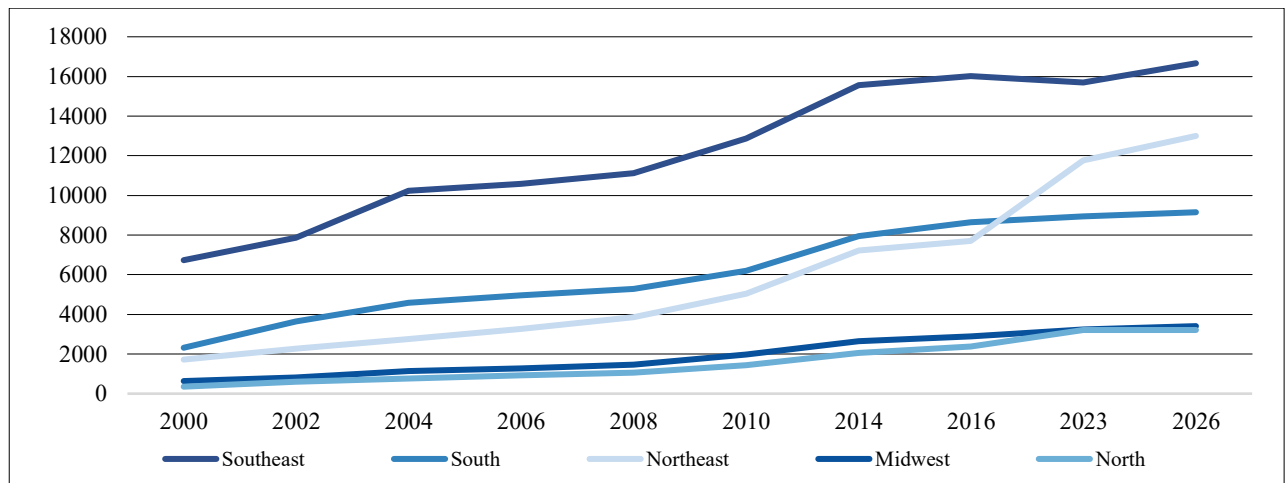


Figure 2. Growth of Brazilian Research Groups by Regions through 2000-2026.

In 2000, a total of 11,760 research groups were registered in Brazil. By 2025, this number had risen to 45,480, representing an increase of more than 350% over a 25-year period in absolute terms. It is noteworthy that this upward trend in the number of research groups occurred in all regions of the country, even though each presents particular characteristics. As a country of continental scale, Brazil exhibits marked levels of inequality that are also reflected in the architecture of higher education and research policy. This means that some regions display trajectories in science and technology that are far more advanced than others. The territorial distribution of higher education institutions and, more specifically, of graduate programs makes these contrasts particularly evident (Reyes & Lamego, 2021), highlighting the challenges that persist for the production of scientific knowledge at a national scale. The previous figure shows in greater detail the regional differences in the evolution of the number of research groups in Brazil: the Southeast region concentrates the largest number, with a total of 16,664 groups according to 2025 data.

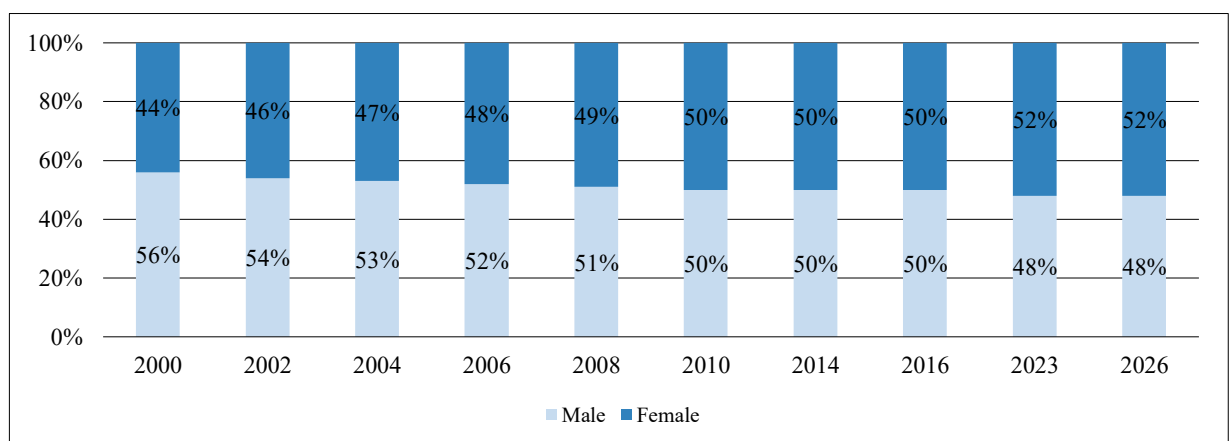


Figure 3. Evolution of the Gender Composition of Research Group Leadership (2000–2026).

In 2000, this figure was 6,733, which represents an increase of approximately 233%. Indeed, all Brazilian regions show a substantial rise in the number of research groups. In the South, which had 2,317 groups in 2000, there was an increase of approximately 295%, reaching 9,151 research groups in 2025. In the Center-West, the increase was approximately 436%, from 636 groups in 2000 to 3,408 in 2025. The two regions that recorded the highest growth rates were the Northeast, with an increase of approximately 656%, rising from 1,720 groups in 2000 to 12,998 in 2025, and the North, where the number of groups expanded from 354 to 3,211, representing an increase of approximately 807%.

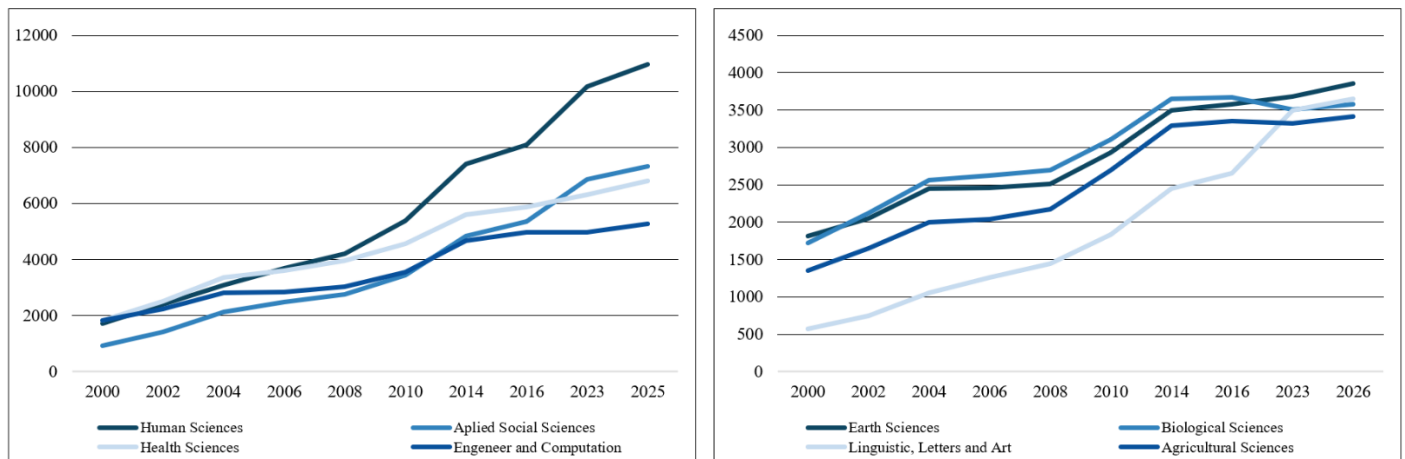


Figure 4. Temporal Evolution of research groups across major fields of knowledge (2000–2026).

Finally, the gender composition of the research community reveals no marked disparities at the aggregate level. Between 2000 and 2008, men remained numerically predominant, whereas the 2010, 2014 and 2016 censuses pointed to an increasing convergence between male and female participation. By 2025, this trend had culminated in a reversal of the historical pattern, with women accounting for 52% of all researchers and thus becoming the majority. Nevertheless, these national aggregates should be interpreted with caution, as important differences may persist across particular fields of knowledge, reflecting distinct disciplinary trajectories and gendered dynamics of scientific participation.

Taking into account the specificities of scientific disciplines, as well as shared affinities, CNPq has established a classification that organizes knowledge into broad fields. This division is crucial, since it underpins numerous funding calls and enables the construction of a more robust overview of Brazil's scientific production. The eight major fields of knowledge in the country are: Human Sciences, Applied Social Sciences, Health Sciences, Engineering and Computer Science, Exact and Earth Sciences, Biological Sciences, Languages, Literature and Arts, and Agricultural Sciences. Research groups are likewise classified according to these categories. The following figure presents information on the growth in the number of research groups in each major field of knowledge, as well as on their proportional differentiation.

Although the methodological flowchart presented in the previous figure suggests a relatively standardized pathway, it is crucial to recognize that research groups are far from being homogeneous units. Organizational forms and modes of operation vary significantly across fields of knowledge, institutional cultures, interests and the specific trajectories of each collective. There is, therefore, no ideal size or single organizational model that can serve as a reference point. In some contexts, the duration of research, the density of networks, often international, and the degree of institutionalization of internal routines are central; in others, these elements clearly assume a secondary role. This heterogeneity must be taken into account when interpreting the data so as to avoid hasty generalizations about what a “typical” research group would be.

Table 1. Evolution of research groups in the Human Sciences by field (2000–2025).

	Field	2000	2002	2004	2006	2008	2010	2014	2023	2025
Human Sciences	Education	651	859	1194	1483	1711	2236	3219	3996	5328
	Psychology	268	397	454	538	567	669	854	852	981
	History	200	269	366	437	525	696	838	912	1152
	Sociology	187	240	296	344	382	479	621	663	824
	Philosophy	115	138	220	238	292	383	525	519	696
	Anthropology	113	142	181	199	225	249	367	342	476
	Political Science	92	95	128	153	172	216	311	381	548
	Geography	71	111	190	185	203	313	516	572	747
	Theology	28	41	54	47	61	71	98	120	122
	Archaeology	26	26	37	37	38	58	71	72	87
	Total	1751	2318	3120	3661	4176	5370	7420	8429	10961

Education, Psychology, History, Sociology, Philosophy, Anthropology, Political Science, Theology and Archaeology are the disciplines that, together with Geography, comprise the broader field of the Humanities In Table 1. It is noteworthy that Geography is not the discipline with the largest number of research groups within this area, a position occupied by Education. However, Geography is the discipline that has shown the greatest quantitative growth, with an increase of more than 1,000% between 2000, when there were 71 groups, and 2025, when the number reaches 747.

4.2. Research Groups in Geography in Brazil

The establishment of the first research group in Geography, registered in 1983, occurred precisely at the moment when national policies to expand graduate education in Brazil were being consolidated. Yet it emerged in the Department of Geography at the Federal University of Santa Maria (UFSM), a university located in the state of Rio Grande do Sul, outside the Metropolitan Region of Porto Alegre. Notably, this origin contrasts with the historical centrality of the Southeast Region in the Brazilian university system—especially the states of São Paulo and Rio de Janeiro which, since the first half of the twentieth century, have hosted the country's main centers of scientific excellence. These states continue, to this day, to lead indicators related to academic production and performance in national and international rankings, reinforcing their position as hegemonic poles in the Brazilian scientific system.

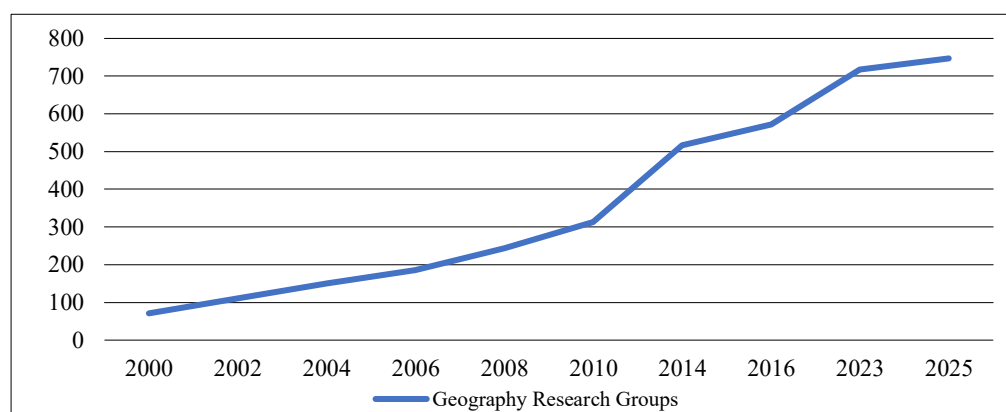


Figure 5. Growth of Geography Research Groups through 2000 – 2025.

To some extent, this apparent paradox reflects a spatiality and temporality characteristic of an earlier period, when compared with current dynamics of scientific organization in Brazil and in much of the world. At that time, research groups in Brazil were not yet subject to the structural demands now imposed by graduate programs and state funding agencies, nor were they fully integrated into the institutional circuits of legitimation that shape competition for resources and recognition among scientific leaders.

From the 2000s onward, however, there has been a marked increase in the number of Geography research groups across the country. This process is directly linked to the expansion of the graduate education system, the reconfiguration of public universities, and the strengthening of evaluation mechanisms that increasingly rewarded scientific productivity, particularly through research productivity fellowships and the training of highly qualified human resources at the master's and doctoral levels.

The structural transformations implemented by the Brazilian federal government since the 2000s onwards triggered a veritable race, by both individual researchers and of institutions, to create research groups. In this context, holding a doctoral degree and being embedded in graduate programs became key strategic requirements for the consolidation of these collectives. Major national institutions, especially those located in state capitals and metropolitan areas and with a longer history of scientific internationalization, were the first to benefit from this process. Many of them had academic staff trained in doctoral and postdoctoral programs abroad, which provided strategic familiarity with international trends as they were being translated into the Brazilian context and granted them competitive advantages in the struggle for funding and prestige.

Thus, the South, Southeast and Northeast regions, the latter particularly in major coastal urban centers, emerged as the main poles for the growth of Geography research groups in Brazil, reproducing, to some extent, the historical legacies of the country's territorial formation. This pattern underscored the persistence of a deeply unequal geography of knowledge, in which institutional concentration reinforced the dominant circuits of scientific production.

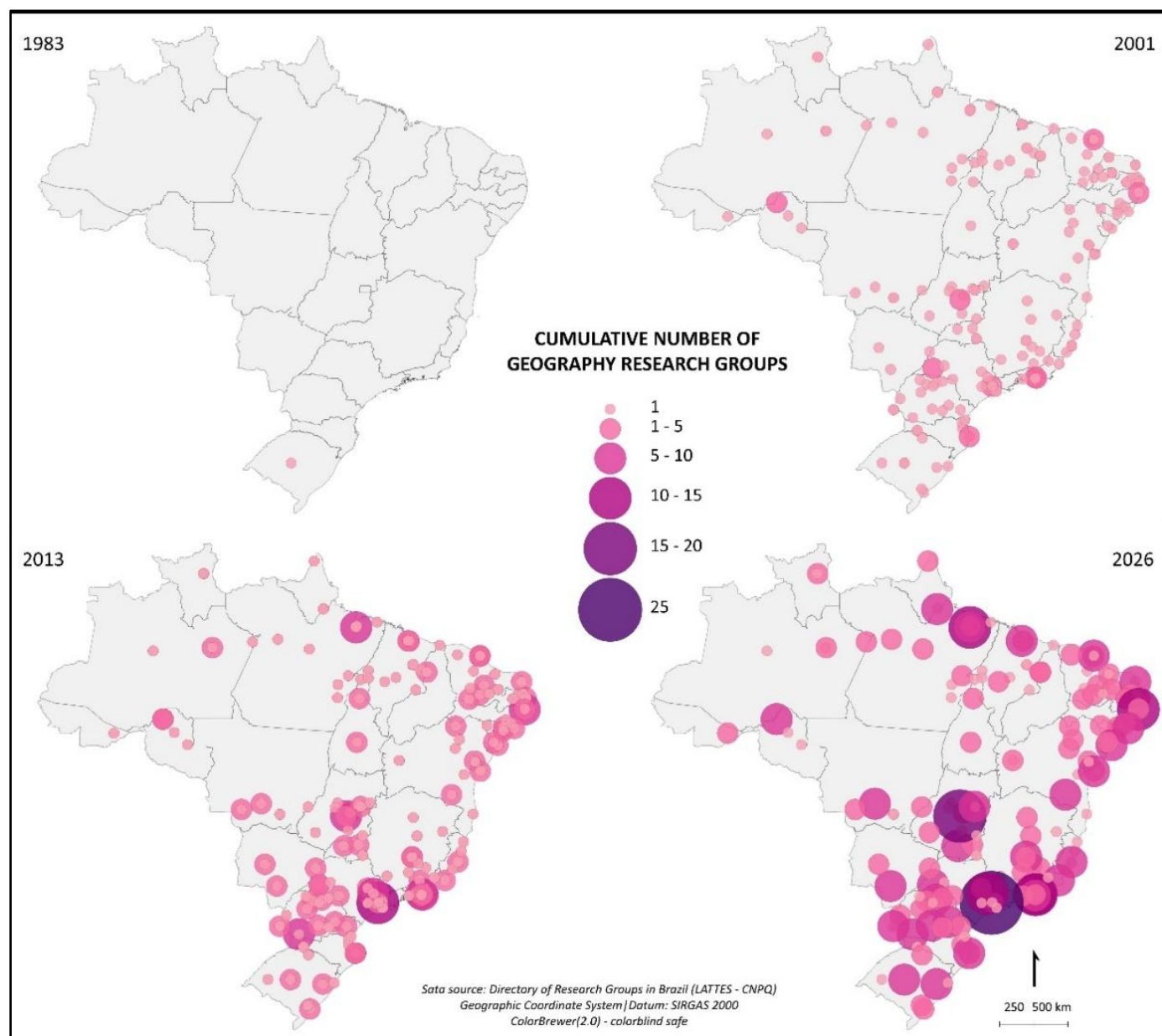


Figure 6. Evolution of Geography Research Groups in Brazil (1983-2026).

This pattern persisted across the subsequent years in the time series, with the same three regions continuing to lead in the number of research groups, albeit with two important inflections. The first concerns the Center-West region, where institutions such as the University of Brasília (UnB) and the Federal University of Goiás (UFG) came to play a strategic role, benefiting both from the country's political-administrative centrality and from the intensified circulation of human capital and resources associated Brasília (the Federal District,) and the city of Goiânia, the capital of the state of Goiás.

The second inflection relates to the North region, where the Federal University of Amazonas (UFAM) and the Federal University of Pará (UFPA) stand out in particular. Both located along the Amazon River system, these institutions have historically mediated the global connections of the cities of Manaus and Belém for at least two centuries, driven by long-standing political, economic and cultural relations. Their regional prominence contrasts sharply with other, more inland areas of the Brazilian North, a pattern that is likewise reproduced in the Center-West and in the interior areas of the other Brazilian regions.

With regard to the internal composition of Geography research groups in Brazil, the data reveal a marked concentration in five major fields of activity: Human Geography (336 groups), Physical Geography (94), Geographical Education (89), Regional Geography (60) and Geotechnologies (34). This distribution reflects not only the breadth of the discipline of Geography, but also the complexity of its thematic and institutional organization in the country.

The prominence of Human Geography must be understood in light of its highly diversified internal configuration, which encompasses a wide range of subfields such as Urban Geography, Agrarian Geography, Cultural Geography and Economic Geography. This heterogeneity helps explain the substantial number of research groups within this field, demonstrating its epistemological vitality and its capacity to engage with multiple scientific and social agendas across Brazil's different regions, as well as with the institutional logics that structure the respective federal states. Ultimately, the thematic distribution of research groups reveals a Brazilian Geography marked by thematic plurality and a growing degree of specialization that sustains the importance of this disciplinary field.

On the other hand, the strong presence of Geographical Education among the most represented fields deserves particular attention. This prominence directly reflects the importance of training Geography teachers for basic education, a process frequently associated with the expansion of higher education into Brazil's interior across the national territory. Research groups working in this field not only produce knowledge about the teaching of Geography, but also play a strategic role in articulating universities and basic education, fostering training practices and pedagogical innovations that respond to the territorial realities in which they are embedded. In this sense, Geography Education emerges as a structuring axis of the discipline, connecting scientific production, teacher education, and commitments to national and state plans for public education, with research groups operating as strategic sites within Geographies of Knowledge, especially in a context marked by shortages of Geography teachers in many small municipalities and in peripheral areas of metropolitan regions across different Brazilian states.

The role of research group leaders is also crucial, as it allows an assessment of gender representation in these positions. In the case of Geography, groups may have one or two leaders, and the CNPq does not allow the registration of more than two. In practice, shared leadership is common: 236 groups (38%) have a single leader, whereas 378 groups (62%) are coordinated jointly by two leaders.

Table 2. Distribution of Subfields Across Geography Research Groups in Brazil.

Field	Subfield	Total	Male	Male %	Female	Female%
Human Geography	Urban Geography	108	67	62%	41	38%
	Agriculture Geography	116	70	60%	46	40%
	Cultural Geography	94	56	59%	38	41%
	Political geography	81	57	70%	24	30%
	Economic Geography	66	49	74%	17	26%
	Humanistic Geography	35	23	65%	12	35%
	Geography of Population	14	7	50%	7	50%
	Epistemology	13	9	69%	4	31%
	Geography of Health	9	6	66%	3	34%
	Historical Geography	6	6	100%	0	0%
Physical Geography	Geoeology	44	21	48%	23	52%
	Environmental Analysis	37	16	43%	21	57%
	Hydrography	23	16	69%	7	31%
	Climatology	15	9	60%	6	40%
	Biogeography	15	8	53%	7	47%
	Geomorphology	11	7	63%	4	37%
	Pedology	3	2	66%	1	34%
	Geographical Education	149	61	41%	88	59%
Regional Geography	Regional Analysis	69	46	67%	22	33%
	Theory of Regional Development	26	20	76%	6	24%
	Regionalization	2	2	100%	0	0%
Geotechnologies	Geotechnology	29	21	72%	8	28%
	Cartography	25	13	52%	12	48%

With regard to the other members, these positions may include researchers, undergraduate students, master's students, doctoral candidates, postdoctoral researchers, technical staff and international collaborators. Accurately quantifying the exact number of individuals involved in

research groups is challenging, since a given student or researcher may belong to more than one group, a common practice, particularly among PhD holders who establish collaborative ties with several groups simultaneously. It is therefore important to emphasize that the number of participants should not be interpreted as representing unique individuals, but rather as registrations of members affiliated with specific research groups and, as such, counted in that capacity.

Across all Geography research groups in Brazil, there are 13,033 registered members, of whom 5,903 (45%) are PhD holders and 167 (1.2%) are international collaborators. Table 2 below presents additional information that is crucial for understanding Geography research groups in Brazil and their composition in terms of human resources.

Out of a total of 996 researchers registered as group leaders, 598 (60%) are men and 398 (40%) are women. In fact, male predominance persists when leadership is disaggregated by the main fields of Geography. In Human Geography, which has 542 leaders in total, 64% are men. A similar pattern of male hegemony is observed in Physical Geography, where 53% are men, as well as in Geotechnologies, with 62%. Regional Geography is the field with the highest proportion of male leaders: among its 96 leaders, 71% are men. The only field of Geography in which women outnumber men in leadership positions is Geography Education; of its 149 leaders, 59% are women. Greater female presence in leadership can also be observed in two subfields: in Geocology groups, 52% of leaders are women, and in Environmental Analysis groups, women account for 57% of leadership positions. It is worth noting that the groups in the subfields of Historical Geography and Regionalization are entirely led by men, with 100% male leadership in both cases.

In light of these results, these findings show that Geography research groups in Brazil operate as key components in the institutional, spatial and symbolic structuring of geographical science in the country. Their uneven distributions, privileged thematic fields, leadership patterns and articulations with training processes and territorial contexts all point to the complexity and tensions shaping the discipline. While they express historical continuities in Brazil's territorial and scientific formation, these groups also reveal new dynamics of mobility, specialization and differentiation. From this perspective, understanding research groups as places of knowledge not only enables a cartography of Brazilian science, but also supports a critical reflection on the mechanisms of concentration, exclusion and recognition within the national scientific system. Building on these reflections, the concluding section presents the main conceptual and empirical contributions of the research, highlighting its limitations, contributions and potential avenues for future investigations in the field of Geographies of Knowledge.

5. Discussion

The findings presented here strongly reinforce one of the central propositions of the Geographies of Knowledge: scientific knowledge is neither produced in an abstract environment nor distributed evenly across space. Rather, it emerges within specific material, institutional and historical contexts that shape the conditions under which knowledge is produced and circulated (Livingstone, 1995, 2003; Meusbürger *et al.*, 2010). The trajectory of Geography research groups in Brazil illustrates this process particularly well. Their emergence, expansion and differentiation were not spontaneous developments but the outcome of public policies, institutional arrangements and territorial trajectories that progressively transformed research groups into one of the principal organizational forms of scientific activity in the country. Consequently, the geography of these collectives is inseparable from the geography of Brazilian science itself.

From this perspective, research groups may be understood as genuine places of knowledge. Following Livingstone (2003), places are not passive containers within which scientific activities occur; rather, they actively shape the production of knowledge by conditioning who participates in scientific communities, what questions become legitimate and which forms of knowledge acquire visibility and recognition. Research groups therefore constitute material and symbolic environments in which scientific practices are organized, research agendas negotiated and disciplinary identities reproduced. Their territorial distribution reveals that knowledge is profoundly situated and that scientific activity depends upon specific institutional and geographical conditions that enable certain forms of inquiry while constraining others.

The marked concentration of research groups in the Southeast and South regions illustrates this process particularly clearly. These regions benefited from earlier investments in higher education, the historical concentration of universities and graduate programmes, and privileged access to scientific resources and infrastructures. In turn, these accumulated advantages generated favourable conditions for the expansion of research groups and the consolidation of more complex scientific communities. The remarkable growth observed in the North and Northeast over the last two decades should therefore not be interpreted as evidence of a homogeneous national scientific

system but rather as an indication of the gradual diffusion of scientific infrastructures into regions that historically occupied more peripheral positions within the Brazilian geography of science. The uneven distribution of research groups thus reveals the persistence of a differentiated and hierarchical scientific landscape, marked by unequal capacities to produce and legitimize knowledge.

This interpretation also resonates strongly with Bourdieu's (2001) conception of science as a relatively autonomous field structured by unequal distributions of scientific, institutional and symbolic capital. The expansion of Geography research groups in Brazil did not eliminate scientific inequalities; instead, it generated new forms of competition for resources, prestige and legitimacy. The ability to establish and sustain research groups depends upon access to highly qualified human resources, research funding, graduate programmes and national and international networks of collaboration. These resources are unevenly distributed and tend to generate cumulative advantages for institutions and researchers, reinforcing hierarchical positions within the scientific field.

Research groups should therefore not be understood merely as administrative arrangements or formal structures created to satisfy the demands of research agencies. Rather, they are strategic sites through which scientific capital is accumulated, reproduced and converted into prestige and authority. Their leaders occupy privileged positions because they control resources, define research agendas, mediate access to networks and influence the training of new generations of researchers. In this sense, research groups constitute arenas of scientific struggle in which different actors compete for recognition and legitimacy, reproducing many of the mechanisms described by Bourdieu (2001).

The gender patterns identified in leadership positions further illustrate these dynamics. Although women now constitute the majority of researchers in Brazil, leadership positions in Geography research groups continue to be predominantly occupied by men, particularly in the most traditional subfields. This finding suggests that the democratization of access to scientific careers does not necessarily imply a corresponding redistribution of symbolic authority and scientific capital. The persistence of male predominance in positions of leadership indicates that mechanisms of recognition and prestige remain unevenly distributed within the scientific field, revealing subtle yet enduring forms of exclusion and differentiation.

The results also contribute to contemporary debates concerning the Global South and the uneven geographies of knowledge production. Recent scholarships have shown that scientific activity remains characterized by profound asymmetries in visibility, influence and recognition between different world regions (Demeter, 2022; Mazzega *et al.*, 2025; Nakamura *et al.*, 2023). At the same time, a growing body of literature has argued that the Global South should not be treated as a homogeneous category but rather as a highly differentiated and internally unequal space (Guzman-Valenzuela *et al.*, 2023; Hammett *et al.*, 2024; Liu & Daud, 2025). The Brazilian case provides compelling empirical support for this argument.

The geography of research groups reveals the existence of internal centres and peripheries of scientific production that reproduce, at a national scale, many of the asymmetries observed in the global scientific system. Historically consolidated institutions located in metropolitan areas and economically dynamic regions occupy positions analogous to scientific centres, concentrating resources, infrastructures and opportunities for collaboration. Conversely, other regions continue to face structural constraints in establishing and sustaining scientific communities, limiting their capacity to participate in broader circuits of knowledge production and circulation. Inequalities in the production of knowledge therefore cannot be understood solely through the lens of North-South relations; they are also reproduced within national scientific systems themselves.

Finally, the findings suggest that research groups should be conceptualized as strategic and multiscale infrastructures of knowledge production in the Global South. Contemporary science increasingly depends upon collective forms of organization, networks of collaboration and institutional arrangements that connect researchers and territories across multiple scales (Miao *et al.*, 2022; McManus *et al.*, 2023, 2024). Yet these networks remain deeply rooted in particular places and institutions. Research groups constitute precisely the spaces through which these connections are materialized, linking local and global scientific processes while simultaneously reproducing and contesting existing epistemic hierarchies.

The Brazilian experience therefore demonstrates that the Geographies of Knowledge must pay closer attention to the institutional and territorial infrastructures through which scientific communities are organized. Research groups are not simply organizational devices; they are places where knowledge is produced, scientific authority is negotiated and epistemic inequalities are materialized. Examining their geography makes it possible to understand not only the spatial organization

of science in Brazil but also the broader processes through which centres and peripheries of knowledge production are continuously produced, reproduced and contested within the Global South.

6. Conclusion

This article has presented an unprecedented analysis of Geography research groups in Brazil, drawing on official data from the CNPq Directory to offer a critical reading of their formation and operation, while underscoring the relevance of these collectives as institutional forms of national science. The results reveal, on the one hand, the significant growth of research groups over the past three decades and, on the other, deep territorial inequalities, with strong concentration in the most consolidated regions of the university system, especially in the states of the Southeast and South. They also highlight key elements of the thematic organization of Brazilian Geography, including the centrality of Human Geography and Geography Education in academic production, as well as marked gender asymmetries in scientific leadership, particularly in the most prestigious subfields or those with greater institutional density. Taken together, this picture reveals both the dynamism and the tensions that shape the geographical field in Brazil in the first quarter of the twenty-first century.

These findings engage directly with contemporary debates in the Geographies of Knowledge, which conceptualize science as a phenomenon situated in space and constructed socially and epistemically. When examined as places of knowledge, research groups make visible the co-presence of multiple scales (Livingstone, 2003; Sidaway, 2000), power relations (Latour, 1987; Bourdieu, 2001) and institutional logics that operate simultaneously in the production and legitimization of knowledge. They constitute epistemic territories in which scientific agendas are defined, legitimate forms of inquiry are contested, and hierarchies between territories, institutions and disciplinary fields are reproduced.

The study further reinforces the role of research groups as central actors in the consolidation of disciplinary fields in countries in the Global South, where science develops in contexts marked by resource scarcity, institutional instability and various forms of dependency vis-à-vis hegemonic centers of power. The Brazilian case makes clear that the geography of scientific knowledge is traversed by territorial and historical inequalities, expressing enduring legacies of the coloniality of knowledge that manifest both at regional scales and within the hierarchies of the international scientific system. Despite the high number of groups and the substantial volume of active researchers, the Brazilian academic structure still operates according to logics that reproduce global asymmetries; at the same time, the analysis undertaken makes it possible to glimpse the ways in which peripheral scientific communities construct their own regimes of legitimacy, negotiation and resistance.

Geography research groups in Brazil thus operate in a condition of ambivalence: on the one hand, they respond to the demands for recognition imposed by the international academic system; on the other, they function as sites of regional rootedness, situated knowledge production and engagement with concrete social demands. This tension between the globalization of science and efforts toward epistemic resistance constitutes a key interpretive lens for understanding the dilemmas faced by the Geographies of Knowledge in postcolonial and decolonial contexts (Asher, 2013; Radcliffe, 2017; Clayton, 2003).

Finally, although this work relies on a broad and institutionally consolidated database, namely the CNPq Directory of Research Groups, it also exposes important limitations, particularly in relation to the need to apprehend the internal dynamics, individual trajectories, strategies of recognition and aspirations of those who participate in these collectives. This opens up an agenda for more in-depth, qualitative research focused on the empirical investigation of group life: their leaderships dynamics, academic sociabilities, symbolic disputes, institutional relations and scientific projects conceived as a field of power. In-depth interviews, participant observation, and documentary analysis of projects and publications, among other qualitative approaches, can offer decisive contributions to understanding the multiple scales of science and its specific geographies, especially in the Global South, where the plurality of knowledges and forms of scientific organization remains scarcely visible in international circuits. Expanding this line of inquiry is not only a scientific task, but also a political and ethical one: it concerns recognizing, including and valuing other epistemologies in the global debate on the meanings and futures of science, grounded in geographies more committed to the diversity of worlds and of possible geographies.

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Conflict of interest

All authors declare that they have no conflicts of interest.

Data availability

Data is available upon Request.

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