



THE EVOLUTION OF RURAL DEVELOPMENT THEORY AND ITS CONTRIBUTIONS TO UNDERSTANDING THE BRAZILIAN SEMI-ARID

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Abstract: This article analyzes the evolution of the main theoretical approaches to rural development and discusses their applicability to the Brazilian Semi-Arid region. The research stemmed from the observation that the region faces challenges related to water scarcity, vulnerability to climate change, poverty, and environmental degradation – factors that call for the generation of knowledge capable of informing public policies aimed at sustainable development. This is a qualitative, exploratory and descriptive study, developed through a bibliographic and narrative literature review of the last sixty years. The study maps the paradigmatic transition from agricultural modernization (1950-1970) to the approaches of new rurality, territorial development and sustainable development, culminating in the recognition of local epistemologies and coexistence with the Semi-Arid. The results indicate that classical productivist models proved inadequate to regional specificities, while territorial and endogenous approaches – centered on social capital, local governance, pluriactivity and the valorization of peasant knowledge – offer more robust foundations to guide inclusive and sustainable public policies. It is concluded that rural development in the Semi-Arid depends on overcoming the drought-combat paradigm, productive diversification, strengthening family farming and building territorially situated institutional and human capacities.

Keywords: Climate change; Social capital; New rurality; Territory.

A EVOLUÇÃO DA TEORIA DO DESENVOLVIMENTO RURAL E SUAS CONTRIBUIÇÕES PARA A COMPREENSÃO DO SEMIÁRIDO BRASILEIRO

Resumo: Este artigo analisa a evolução das principais abordagens teóricas do desenvolvimento rural e discute sua aplicabilidade ao contexto do Semiárido brasileiro. A investigação partiu da constatação de que a região apresenta desafios relacionados à escassez hídrica, à vulnerabilidade às mudanças climáticas, à pobreza e à degradação ambiental — fatores que demandam a produção de conhecimento capaz de subsidiar políticas públicas voltadas ao desenvolvimento sustentável. Trata-se de pesquisa qualitativa, de caráter exploratório e descritivo, desenvolvida por meio de revisão bibliográfica e narrativa da literatura dos últimos sessenta anos. O estudo mapeia a transição paradigmática da modernização agrícola (1950-1970) às abordagens da nova ruralidade, desenvolvimento territorial e desenvolvimento sustentável, culminando no reconhecimento das epistemologias locais e da convivência com o Semiárido. Os resultados indicam que os modelos produtivistas clássicos se revelaram inadequados às especificidades regionais, ao passo que as abordagens territoriais e endógenas – centradas no capital social, na governança local, na pluriatividade e na valorização dos saberes camponeses – oferecem fundamentos mais robustos para orientar políticas públicas inclusivas e sustentáveis. Conclui-se que o desenvolvimento rural no Semiárido depende da superação do paradigma do combate à seca, da diversificação produtiva, do fortalecimento da agricultura familiar e da construção de capacidades institucionais e humanas territorialmente situadas.

Palavras-chave: Mudança climática; Capital social; Nova ruralidade; Território.

1 Introduction

The Brazilian Semi-Arid constitutes a strategic area for academic research due to its economic, social, and environmental relevance. It is home to a substantial population of 27.8

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million people (Semi-Arid National Institute [INSA], 2026), who depend directly on family farming and natural resources for their subsistence.

According to Lemos and Santiago (2020), the region faces challenges related to water scarcity, vulnerability to climate change, poverty, and environmental degradation, factors that call for the production of knowledge capable of informing public policies aimed at sustainable development. At the same time, INSA (2016) highlights that the Semi-Arid encompasses potentialities associated with the biodiversity of the Caatinga, social technologies for living with drought, and the adaptive capacity of local communities, making it an important laboratory for the development of strategies for innovation, food security, water resource management, and the strengthening of socioeconomic resilience.

The persistence of poverty and inequalities in the Brazilian Semi-Arid reflects not only the limitations imposed by climate variability but also the historical insufficiency of investments in education, infrastructure, sanitation, access to water, and productive opportunities. In this context, the socioeconomic vulnerability of the rural population is reinforced by multiple forms of deprivation that restrict income generation and social inclusion, perpetuating a cycle of inequality among the municipalities of the region (Lemos, 2020).

In light of this situation, the following guiding question arises: to what extent do the theoretical approaches to rural development formulated over the past sixty years provide an adequate basis for guiding sustainable development strategies in the Brazilian Semi-Arid, taking into account its environmental, social, and economic specificities?

Recent scientific research highlights the importance of a differentiated perspective on this region, recognizing its social, economic, and environmental heterogeneity. However, the literature on rural development applied to the Semi-arid remains predominantly fragmented – the available studies tend to address isolated dimensions of the phenomenon (productive, environmental, social, or institutional) without integrating them into a comprehensive theoretical analysis (Leite, 2022).

This fragmentation is also reflected in the field of public policy: according to Aguiar *et al.* (2019), one of the main gaps identified in the literature is precisely the incipient coordination between the different approaches and instruments aimed at the development of the Semi-Arid. Thus, the need for a theoretical review that systematically and comprehensively examines the historical evolution of the main approaches to rural development and critically assesses their applicability to the specific context of the Semi-Arid is justified, contributing both to academic research and to the planning of territorially grounded public policies.

Given the above, the general objective of this article is to analyze the evolution of the main theoretical approaches to rural development and discuss their applicability to the context of the Brazilian Semi-Arid Region. To achieve this objective, the following specific objectives were



established: (i) to map the historical evolution of the concept of rural development; (ii) to discuss the main theoretical currents that have guided this debate over the past sixty years; and (iii) to analyze the contributions of these approaches to understanding rural development in the Brazilian Semi-Arid, identifying the limitations and potential of their application to the regional context.

The study is based on the hypothesis that more recent theoretical approaches to rural development, particularly those with a territorial and endogenous focus, provide a more adequate basis for guiding sustainable development in the Semi-Arid than classical agricultural modernization models, as they recognize the central role of local assets, pluriactivity, social capital, and institutions in fostering the development of rural territories. It is also assumed that understanding the vulnerabilities and potentialities of the Semi-Arid in light of these approaches is a necessary condition for formulating public policies capable of promoting more equitable, sustainable, and contextually grounded rural development (Lemos, 2020; INSA, 2016).

The article is structured into five sections, in addition to this introduction. The second section presents the methodological procedures of the study. The third outlines the evolution of rural development theory, based on the main authors and established literature. The fourth section presents the main academic contributions concerning the Brazilian Semi-Arid Region from the perspective of rural development theories. The fifth section examines the main challenges to rural development in the Semi-Arid Region, in light of the contributions and limitations of these approaches to understanding rural development in the Brazilian Semi-Arid Region. Finally, the sixth section presents the concluding remarks, implications for public policies, limitations, and an agenda for future research.

2 Methodological Procedures

This study is characterized as qualitative, exploratory, and descriptive research, conducted through bibliographic research and a narrative literature review. The narrative review was chosen as the methodological approach because it allows for a broad interpretive synthesis of the available theoretical literature, without the strict procedural requirements of a systematic review. It is particularly suitable for research aimed at mapping and discussing the evolution of a theoretical field over time (Cordeiro *et al.*, 2007).

The literature search was conducted in the following databases and repositories: Scientific Electronic Library Online (SciELO), Brazilian Federal Agency for Support and Evaluation of Graduate Education (CAPES), Google Scholar, and institutional repositories of Brazilian universities. Technical documents and reports produced by research and planning institutions directly related to the topic were also consulted, particularly those of the Semi-Arid National



Institute (INSA), the Brazilian Agricultural Research Corporation (Embrapa Semi-Arid), and the Brazilian Institute of Geography and Statistics (IBGE), whose publications constitute indispensable primary sources for characterizing the socio-environmental specificities of the Semi-Arid, as described by Lemos and Santiago (2020) and INSA (2016).

The search was conducted using the following keywords, applied both individually and in combination: “rural development,” “Brazilian Semi-Arid Region,” “family farming,” “territorial development,” “social capital,” “new rurality,” “pluriactivity,” “endogenous development,” and “public policies for the Semi-Arid.”

The temporal scope adopted covers approximately the past sixty years, encompassing works published from the mid-1960s through 2025. This delimitation is justified by the fact that this period marks the consolidation of the modern academic debate on rural development, with the emergence of the first critiques of the classical productivist model and the formulation of territorial and endogenous approaches, which constitute the central theoretical focus of this study and which, according to the hypothesis advanced herein, are more suitable for guiding sustainable development in the Semi-Arid. Classical works published before this period were also included when considered seminal to understanding the theories analyzed.

Regarding the language criteria, works published in Portuguese and English were included, in order to cover both Brazilian literature on the Semi-Arid and relevant international theoretical contributions, particularly those from Latin America and Europe.

The inclusion criteria adopted for the selection of bibliographic material were defined in accordance with the three specific objectives of the study: (i) for the objective of mapping the historical evolution of the concept of rural development, established reference works in the literature were prioritized, including books, seminal articles, and widely cited theoretical reviews; (ii) for the objective of discussing the main theoretical currents, studies representing the different approaches identified in the field were selected, namely agricultural modernization, territorial development, endogenous development, new rurality, and pluriactivity; and (iii) for the objective of analyzing the contributions and limitations of these approaches to the Semi-Arid, empirical and theoretical studies specifically addressing the region’s rural context were included.

As exclusion criteria, studies that addressed rural development only tangentially, without directly contributing to the objectives of the study, were excluded. In total, approximately forty sources were analyzed, including scientific articles, books, book chapters, and institutional documents, selected from a broader initial pool of references identified through the searches.

The selected material was organized into thematic categories corresponding to the main theoretical currents identified in the literature, allowing the conceptual evolution of the field to be mapped and convergences, tensions, and gaps to be identified. Subsequently, each current was



analyzed in terms of its explanatory capacity in relation to the specific characteristics of the Brazilian Semi-Arid, considering its economic, social, environmental, and institutional dimensions, and linking theoretical contributions with the empirical evidence available in the literature on the region. This process of bringing theory closer to the regional context constitutes the central interpretive axis of the study and the analytical criterion used to evaluate the different approaches.

Finally, in accordance with the assumptions underlying qualitative research, it is important to make the authors' position in relation to the object of study explicit. According to Creswell (2010), qualitative research recognizes that the researcher is not a neutral observer, but a situated subject who brings perspectives, experiences, and commitments that inevitably shape analytical and interpretive choices. In this regard, the authors of this study adopt a critical perspective toward exogenous and productivist models of rural development, understanding that such models have historically revealed significant limitations when applied to territories with the socio-environmental specificities of the Brazilian Semi-Arid Region, characterized by climate variability, the predominance of family farming, and historical deficits in human and institutional capital.

This orientation does not compromise the analytical rigor of the review, but rather makes explicit the interpretive framework from which the bibliographic material was selected, organized, and discussed, namely, the recognition of territorial, endogenous, and multidimensional approaches as more appropriate theoretical frameworks for understanding and guiding sustainable rural development in the region, in alignment with the hypothesis and objectives set out in the introduction to this article.

3 Evolution of Rural Development Theory

The evolution of rural development thought is analyzed in this study from a historical-conceptual perspective. Rather than treating the different approaches as independent theoretical currents, the study organizes them according to the main theoretical milestones that have shaped changes in the understanding of rural areas over recent decades. This strategy makes it possible to identify paradigm shifts, showing how new frameworks have incorporated economic, social, institutional, and environmental dimensions into the concept of rural development.

3.1 The Productivist Paradigm of Agricultural Modernization (1950-1970)

The productivist paradigm is the sociological and economic term used to describe the



Green Revolution, a model that became established in Brazil as an agricultural modernization strategy based on the dissemination of high-yielding seeds, mechanization, the intensive use of chemical fertilizers and pesticides, and subsidized rural credit. Grounded in the dominant diffusionist assumption between 1950 and 1970 that the adoption of technological packages would increase productivity and, by extension, promote rural development in a broad sense (Schultz, 1964; Lewis, 1954), the model generated significant gains in production and technical efficiency in Brazilian agriculture.

From a theoretical standpoint, this perspective was grounded in the argument that replacing traditional factors with modern inputs would increase producers' allocative efficiency and overcome the presumed 'backwardness' of traditional agriculture (Schultz, 1964), while the transfer of labor from the agricultural sector to the industrial-urban sector was understood as a natural part of the process of economic development (Lewis, 1954).

As Veiga (2004) points out, the agricultural productivism that characterized this period rested on strictly economic and production-engineering foundations, with the following intrinsic conceptual characteristics: the reduction of agriculture to an industrializable primary sector; the dogma of quantitative growth (agricultural development is reduced to the continuous expansion of physical productivity per hectare or per animal); and an exogenous, diffusionist perspective (technical progress was generated in industrial and scientific centers, and public policy was responsible only for accelerating its diffusion).

3.2 Agricultural Development versus Rural Development (1980-1990)

Following the agricultural modernization cycle that took place between the 1950s and 1970s, it became evident that increased agricultural production did not necessarily lead to rural development along the lines advocated by Theodore Schultz. The exclusive pursuit of productivity gains did not guarantee a broad improvement in living conditions in rural areas. In light of this assessment, a central question emerged in academic debate during the 1980s and 1990s: could agricultural growth occur without actually promoting rural development?

Researchers such as Sergio Schneider, Ricardo Abramovay, and José Graziano da Silva demonstrated that rural development extended beyond the strictly productive dimension. It came to be understood that agricultural growth was a necessary, yet insufficient, condition for transforming rural realities. This distinction is particularly relevant in the Brazilian Semi-Arid, where agricultural production indicators do not always reflect the full range of social and institutional advances in the region.

From the 1990s and 2000s onward, this conceptual shift became consolidated through a



multidimensional perspective. According to Schneider (2009, 2010), rural development should be understood as a territorial phenomenon grounded in the appreciation of family farming, pluriactivity, and the strengthening of local capacities. Along the same lines, Abramovay (2003) emphasizes that rural areas transcend their agricultural function by assuming multiple social and environmental functions, which calls for the strengthening of local institutions. In turn, Silva (1997) and Silva, Del Grossi, and Campanhola (2002) highlight the emergence of the ‘new rural,’ characterized by the diversification of economic activities and the expansion of non-agricultural occupations.

In summary, the convergence among these authors reflects the consolidation of a new paradigm: rural development comes to encompass social inclusion, environmental sustainability, and improvements in quality of life. In the context of the Brazilian Semi-Arid, this multidimensional approach becomes essential for overcoming reductionist perspectives and formulating inclusive development pathways adapted to local dynamics.

3.3 New Rurality (1990-2000)

As previously mentioned, from the 1980s and 1990s onward, amid critiques of agricultural modernization, the concept of the new rurality emerged in the international and Brazilian literature in response to the limitations of approaches that identified rural development exclusively with the growth of agricultural production. This new perspective came to understand rural areas as multifunctional and heterogeneous territories in which agricultural and non-agricultural activities, diverse social relations, new forms of employment, and different strategies for the economic reproduction of rural households coexist. Sergio Schneider and Cristóbal Kay argued in favor of this perspective.

According to Schneider (2009, 2010), the new rurality perspective represents a theoretical shift away from traditional interpretations that restricted rural areas to the function of agricultural production. Under this approach, rural areas are understood as multifunctional territories characterized by the coexistence of agricultural and non-agricultural activities, the appreciation of family farming, pluriactivity, environmental preservation, and the intensification of rural–urban relations.

For Schneider, rural development should be conceived as a multidimensional process in which economic dynamism is associated with the strengthening of local institutions, the participation of social actors, the diversification of income-generation strategies, and the implementation of territorially grounded public policies capable of promoting social inclusion, sustainability, and improvements in the quality of life of rural populations (Schneider, 2010).



Kay (2009), in turn, analyzes the emergence of the ‘new rurality’ as a response to the profound transformations that occurred in rural Latin America during neoliberal globalization. According to him, contemporary rural areas can no longer be understood solely as agricultural spaces, as they have come to incorporate new economic, social, and environmental functions. Thus, he identified four fundamental changes: diversification of economic activities (pluriactivity); the multifunctionality of rural areas; greater integration between rural and urban areas; and the reconfiguration of public policies and territorial development.

Although he recognizes the importance of the concept of new rurality, Kay (2009) offers a critical analysis. He argues that some authors writing on the new rurality tend to place excessive emphasis on economic diversification and the multifunctionality of rural areas, relegating to the background structural issues that affect rural development, such as land concentration, rural poverty, social inequality, power relations in rural areas, and the expansion of agribusiness and neoliberal globalization.

3.4 Rural Territorial Development (2000-2010)

The recognition of the multifunctionality and heterogeneity of rural areas led the rural development literature to adopt the territorial approach. From the 1990s onward, rural development came to be understood not merely as a result of the performance of productive activities, but as a territorially constructed process in which economic, social, institutional, cultural, and environmental factors interact dynamically. From this perspective, the territory is no longer understood as a mere geographical space, but rather as a social construct shaped by relations of cooperation, collective identities, institutions, and governance networks that condition development opportunities.

Abramovay (2000) argues that the territory is a social construct and that development depends on the quality of institutions, social capital, and the capacity for coordination among local actors. In Schneider’s (2004) view, territorial development should take into account the heterogeneity of rural areas and the interaction among actors, economic activities, and institutions.

Favareto (2010), in turn, argues that the emergence of the territorial approach represented an important conceptual advance in rural development theory. However, its incorporation into public policies occurred only partially, representing more of an ‘innovation by addition’ than an effective institutional change, since the new territorial ideas came to coexist with structures and instruments formulated under earlier paradigms.

This article argues that the territorial approach to rural development is closely related to the microeconomic theory of public goods, insofar as it recognizes that territorial development



depends on the provision of collective assets, such as social capital, infrastructure, governance, shared knowledge, and environmental preservation. These assets generate diffuse benefits for the community, have a strong positive externality component, and, in many cases, exhibit the characteristics of non-rivalry and non-excludability, thus aligning with the concept of public goods formulated by Samuelson (1954).

Furthermore, their provision and management often require mechanisms of collective action and institutional cooperation, an aspect emphasized by Ostrom (1990) in studies on the governance of common-pool resources. From this perspective, the territorial development advocated by Abramovay, Favareto, and Schneider can be understood as a process of building and strengthening territorial public goods, whose provision expands economic and social opportunities, reduces transaction costs, and fosters more inclusive and sustainable rural development pathways, particularly in the Brazilian Semi-Arid.

Rural development is a territorially constructed process whose dynamics depend not only on agricultural production, but also on the quality of local institutions, social capital, governance, collective action, and the capacity of actors to mobilize the resources and opportunities available in each territory.

3.5 Sustainable Rural Development and Territorial Resilience (2010-Present)

From the 2010s onward, the debate on rural development became strongly influenced by the consolidation of the sustainability paradigm, resulting from a process that began with the report *Our Common Future* (1991), was further developed at the United Nations Conference on Environment and Development (Rio-92), and was subsequently reaffirmed by the 2030 Agenda and the Sustainable Development Goals (SDGs).

In previous decades, the literature had broadened the concept of rural development by incorporating territorial, institutional, and social dimensions. This new phase represents a synthesis of these advances, recognizing that the development of rural territories depends on the integration of economic growth, social inclusion, environmental conservation, and the strengthening of local institutions. Thus, sustainability ceases to be a complementary dimension and becomes a guiding principle of the very conception of rural development.

In this context, Sachs (2008) argues that sustainable development requires a balanced integration of the economic, social, environmental, territorial, and institutional dimensions, so that wealth generation is compatible with the conservation of natural resources and the improvement of the population's living conditions. This perspective represents a shift from previous paradigms, as it moves the focus from the expansion of production toward the construction of resilient



territorial systems capable of reconciling economic efficiency, social justice, and environmental responsibility. Sustainable rural development thus comes to be understood as a long-term process in which economic competitiveness must be associated with the preservation of natural capital and the strengthening of local capacities.

In the Brazilian literature, Veiga (2005) and Abramovay (2003) contribute to consolidating this paradigmatic evolution by arguing that the sustainability of rural territories depends on overcoming the sectoral view of agriculture and valuing territorial specificities. For these authors, factors such as social capital, territorial governance, innovation, education, cooperation among local actors, and the sustainable management of natural resources are central elements in promoting development pathways capable of combining economic dynamism, social inclusion, and environmental conservation.

From this perspective, the contemporary paradigm of rural development does not entirely replace previous approaches, but rather incorporates them into a broader analytical framework in which economic performance becomes inseparable from the quality of institutions, social cohesion, and the sustainability of territories.

3.6 Local Epistemologies and Endogenous Development: Incorporation or Instrumentalization?

A dimension frequently neglected in academic approaches to rural development concerns the epistemological place of local knowledge – that is, knowledge historically produced by peasant communities in the management of the Caatinga, rainfed agriculture, and agroforestry systems. In the Brazilian Semi-Arid Region, this knowledge constitutes distinct forms of understanding developed over generations of communities that have periodically faced extreme weather events and accumulated effective practices for living with drought, sustainably managing natural resources, and producing food under adverse conditions (WRI Brasil, 2019; Sousa *et al.*, 2017).

Agroecology, as a science, practice, and social movement, explicitly recognizes this knowledge as the foundation of sustainable production strategies, arguing that family farmers and peasants contribute directly to the perpetuation of agroecological knowledge (Jesus *et al.*, 2024).

However, a central epistemological question arises: do territorial and endogenous academic approaches actually incorporate this local knowledge, or do they instrumentalize it – that is, appropriate it only when it serves scientific logic or institutional policies, without recognizing its epistemological autonomy?

Santos (2007) provides a precise critical framework for this problematization. By proposing the Ecology of Knowledges as a counter-epistemology, the author argues that Western scientific thought operates through ‘abyssal lines’ that divide legitimate knowledge – modern



science – from supposedly illegitimate knowledge – traditional, popular, and local knowledge – rendering the latter invisible or subordinating it to academic logic when convenient. From this perspective, territorial approaches that claim to value local knowledge but reduce it to ‘good practices’ to be catalogued and transferred engage in precisely this kind of instrumentalization, reproducing, albeit unintentionally, the epistemological asymmetry they claim to overcome (Santos; Meneses, 2010).

It is precisely at this point that the paradigm of living with the Semi-Arid Region represents the most consistent effort to overcome this tension in the regional context. As Barbosa and Hernández (2025) acknowledge, living with the Semi-Arid has entailed a new territorial rationality, guided by the decentralization of public policies, the recognition of ecological diversity, and the appreciation of the knowledge and practices of the region’s peoples – thus constituting an epistemological break with the logic of combating drought, which viewed the climatic phenomenon as an enemy to be defeated through centralized and exogenous hydraulic solutions.

Within this paradigm, peasant knowledge concerning Caatinga management, rainwater harvesting, community seed banks, and agroforestry systems is not treated as ethnographic curiosity to be incorporated into policies, but as a legitimate foundation for territorially grounded development strategies. This therefore represents an advance that challenges the theories of endogenous development themselves, requiring them not merely to declare their respect for local knowledge, but to develop methodologies and policies that genuinely recognize such knowledge as valid and autonomous epistemologies.

Table 1 below summarizes the paradigms and concepts discussed in this section.

Table 1 —The evolution of rural development theory: mapping the main paradigms

Period	Paradigm	Central concept	Key authors	Identified limitations
1950–1970	Agricultural modernization / Green Revolution	Productivity as a synonym for development	Schultz (1964); Lewis (1954); Veiga (2004)	Social exclusion; environmental degradation; failure to promote broad-based rural development
1980–1990	Distinction between agricultural development and rural development	Multidimensionality ;agricultural growth differs from rural development	Schneider (2009, 2010); Abramovay (2003); Silva (1997); Silva, Del Grossi and Campanhola (2002)	Still focused on agricultural activities; institutional and environmental gaps



Period	Paradigm	Central concept	Key authors	Identified limitations
1990–2000	New rurality	Pluriactivity; multifunctionality; rural–urban integration	Schneider (2009, 2010); Kay (2009); Silva (1997); Silva, Del Grossi and Campanhola (2002)	Risk of underestimating structural issues: land concentration, power, and inequality (Kay, 2009)
2000–2010	Rural territorial development	Territory as a social construct; social capital; governance; territorial public goods	Abramovay (2000); Schneider (2004); Favareto (2010); Ostrom (1990)	Partial incorporation into public policies; ‘innovation by addition’ (Favareto, 2010)
2010–present	Sustainable rural development and territorial resilience	Integration between economic efficiency, social inclusion, and environmental conservation; SDGs	Sachs (2008); Veiga (2005); Abramovay (2003)	Operationalization challenges in vulnerable territories such as the semi-arid
Cross-cutting	Local epistemologies and living with the semi-arid	Peasant knowledge as autonomous epistemologies; break with the paradigm of combating drought	Santos (2007); Santos and Meneses (2010); Barbosa and Hernández (2025); WRI Brasil (2019)	Risk of instrumentalization of local knowledge by academic territorial approaches

Source: Developed by the authors (2026).

4 The Brazilian Semi-Arid from the perspective of rural development theories

4.1 Structural Characteristics of the Semi-Arid

The Brazilian Semi-Arid is one of the largest semi-arid regions in the world in terms of territorial extent and population density, encompassing the nine states of Brazil’s northeast region and the northern part of Minas Gerais. This region accounts for approximately 12% of the national territory and is home to around 28 million inhabitants, distributed across urban and rural areas, making it a territory of considerable social, economic, environmental, and cultural significance for the country. Despite the limitations imposed by climatic conditions, the Semi-Arid exhibits considerable diversity in natural resources, production systems, and forms of social organization, reinforcing its strategic importance for studies related to regional development, family farming, and public policies aimed at promoting coexistence with its specific environmental conditions (INSA, 2024).

Lemos (2020) adds that this climate does not result in homogeneity in terms of landscape, natural resource availability, or floristic composition. The common feature across the vast area



that makes up the region is climatic instability, reflected in the uneven distribution of rainfall, both spatially and temporally. Another feature shared by the various mosaics found within this Brazilian ecosystem is the presence of agricultural activities, particularly food production carried out by family farmers, as well as extensive livestock farming, all of which are considered high-risk activities. These activities exhibit very low levels of productivity, even when compared with those observed in areas of the Northeast Region outside the Semi-Arid, with some of these productivity levels being among the lowest in Brazil (Lemos, 2020).

4.2 Limitations of the productivist approach to the Semi-Arid

Lemos (2012) argues that the productivist paradigm has proven insufficient to promote the development of the Brazilian Semi-Arid. His analyses show that the model's limited adaptability stems from the region's specific characteristics, such as irregular rainfall, high climate vulnerability, the predominance of family farming, and the socioeconomic constraints faced by producers.

According to this researcher, policies aimed exclusively at increasing agricultural productivity tend to yield poor results when they disregard the environmental and institutional characteristics of the Semi-Arid. He argues that regional development should focus on strategies for living with these climatic conditions, efficient water resource management, strengthening family farming, diversifying economic activities, and expanding human and social capital.

In his critique of the productivist approach, Favareto (2010) emphasizes that this approach treats rural areas as homogeneous, thereby ignoring the fact that each territory has its own economic, social, institutional, cultural, and environmental characteristics. This idea can be applied to the reality of the Brazilian Semi-Arid, where territorial heterogeneity means that standardized agricultural modernization policies produce different outcomes, reinforcing the need for development strategies adapted to the region's specific characteristics. The author argues that the territorial paradigm emerged precisely because policies focused solely on agriculture and productivity were unable to explain or address the differences among rural territories.

Reinforcing these criticisms, Nehring (2022) points out that the model also contributed to land concentration, the exclusion of small-scale producers, and increased dependence on industrial inputs, in addition to causing environmental impacts associated with soil degradation, water resource contamination, and biodiversity loss. From this critical perspective, the Green Revolution paradigm contributed little to addressing the realities of the Brazilian Semi-Arid and has been questioned for prioritizing a capital-intensive technological model and deepening social and environmental inequalities in rural areas.



4.3 Contributions of the new rurality

The established academic view of the new rurality is that it represents a shift in the way rural areas are understood. Rather than viewing and limiting them to spaces of agricultural production, the literature has come to understand them as multifunctional territories in which agricultural and non-agricultural activities coexist alongside economic, social, cultural, and environmental functions. In this context, pluriactivity is considered one of the main expressions of the new rurality. As Schneider (2009) notes, pluriactivity is defined as a strategy in which members of the same rural family simultaneously engage in agricultural and non-agricultural activities while maintaining ties to the family establishment.

Regarding non-agricultural activities, Silva, Del Grossi, and Campanhola (2002) highlight that their expansion stems from structural transformations in the Brazilian countryside, particularly agricultural modernization and the growing integration of rural and urban areas. As mechanization reduced the demand for agricultural labor, new occupations emerged as an alternative source of employment and income for rural families. Thus, rural areas began to fulfill functions that extend beyond food production, contributing to the diversification of the local economy and the creation of new employment opportunities.

Abramovay (2003) expands on this interpretation by arguing that rural development depends on territories' ability to mobilize different economic, social, and institutional resources. From this perspective, activities such as rural tourism, family-based agroindustry, service provision, local commerce, and the solidarity economy strengthen territorial economies by generating employment, adding value to production, and fostering cooperation among local actors. Rural development is thus understood in terms of the diversification of territories' economic bases rather than solely the performance of the agricultural sector.

The specialized literature on rural development also recognizes the important role of government transfers in sustaining the economic livelihoods of rural families, particularly in regions facing greater vulnerability, such as the Brazilian Semi-Arid. According to Schneider (2009, 2010), contemporary rural development is characterized by the diversification of income-generation strategies, through which families combine agricultural production, non-agricultural activities, and pluriactivity with income derived from public policies.

From this perspective, rural social security benefits, income transfer programs, and policies supporting family farming are integral to the economies of rural families and territories, contributing to poverty reduction, consumption stabilization, and improved conditions for remaining in the countryside. This interpretation is supported by Lemos (2012), who highlights



the high degree of dependence of many Semi-Arid municipalities on these resources, which play a central role in stimulating local economies.

Among these instruments, rural social security occupies a prominent position. Delgado and Cardoso Jr. (2000) demonstrate that the universalization of benefits, by placing elderly at the center of household income, helped revitalize the rural family economy, as the regular income from retirement benefits also began to support the production unit, functioning as a form of agricultural insurance.

Thus, in the context of rural development theory, these transfers have ceased to be viewed exclusively as welfare mechanisms and have come to be understood as instruments of social protection and of strengthening the economic capacities of territories, particularly when integrated with policies promoting productive development, education, infrastructure, and support for family farming.

4.4 Contributions of the territorial approach

In the evolution of rural development theory, the territorial approach consolidated the understanding that development depends not exclusively on the availability of productive factors, but also on the capacity of territories to mobilize social and institutional resources. In this context, social capital came to be recognized as a strategic asset, comprising relationships of trust, cooperation, reciprocity, and collective action that facilitate coordination among different local actors and enhance the effectiveness of public policies.

For Abramovay (2000, 2003), social capital is one of the main determinants of territorial development, as it reduces transaction costs, strengthens local institutions, and stimulates processes of innovation and collective learning. Along similar lines, Schneider (2004, 2010) argues that rural development results from the interaction among the actors, organizations, and institutions present in a territory, with cooperation and governance being fundamental elements in promoting more inclusive and sustainable development pathways. Thus, the territorial approach broadens the understanding of rural development by demonstrating that the competitiveness and sustainability of territories depend not only on economic efficiency, but also on the quality of social capital and the capacity for coordination among local agents.

According to Veiga (2001, 2005), the territorial approach emphasizes local specificities, economic diversification, and the capacity for coordination among social actors as fundamental elements in promoting sustainable development. This interpretation aligns with Vázquez-Barquero's (2001) theory of endogenous development, according to which economic growth results from the mobilization of a territory's internal resources, such as human capital, innovation,



entrepreneurship, institutions, governance, and social capital.

Taken together, these contributions make it possible to interpret the territorial approach to rural development as compatible with the foundations of endogenous development theory, since both emphasize the mobilization of internal resources, innovation, institutions, and collective action as drivers of development.

4.5 Sustainable development and coexistence with the Semi-Arid environment

The discussion of sustainable rural development is particularly relevant in the Brazilian Semi-Arid, where climatic constraints and water scarcity present ongoing challenges to productive activities. In this context, authors such as Lemos (2012) argue that the region's economic and social sustainability depends on the adoption of strategies for coexistence with the Semi-Arid, based on efficient water management, the strengthening of family farming, the diversification of income sources, and the valorization of social technologies.

Thus, sustainable rural development should not be understood as the elimination of environmental constraints, but rather as the capacity of territories to develop mechanisms of adaptation and resilience that ensure the economic reproduction of rural families, the conservation of ecosystems, and the improvement of living conditions over time.

5 Main challenges for rural development in the Semi-Arid

As discussed, the evolution of rural development theory converges toward a territorial and endogenous model, but its implementation in the Semi-Arid remains constrained by environmental, structural, institutional, economic, and social challenges.

According to Sachs (1986), development must respect the ecological potential and limits of each territory. Therefore, development strategies should be adapted to local environmental conditions, promoting the rational use of natural resources, social inclusion, and economic efficiency. This perspective breaks with standardized development models by valuing solutions suited to specific territorial contexts.

In line with this perspective, but focusing on the reality of the Brazilian Semi-Arid, Lemos (2015) argues that promoting rural development in this region requires moving beyond policies focused exclusively on emergency responses to droughts, since the region's vulnerability stems primarily from economic, social, and institutional factors. From this perspective, sustainable rural development depends more on the capacity of territories to develop adaptive mechanisms that reduce their vulnerability and promote productive and social inclusion.



Thus, the irregular rainfall patterns that characterize periods of prolonged drought in the Semi-Arid should be understood as a natural phenomenon and addressed through practices suited to living with these conditions, including the democratization of access to water, access to land, the promotion of context-specific education, and support for productive activities adapted to the semi-arid climate.

The structural challenge becomes evident in the low levels of human capital. Low levels of this variable are one of the main characteristics of regions with a low Human Development Index (HDI), as deficiencies in education, health, and economic opportunities limit the development of individual capabilities and labor productivity (Becker, 1993; Schultz, 1973). According to the Brazilian Semi-Arid Articulation (ASA Brasil, 2026), the HDI ranges from very low to low in 60.9% of the municipalities in the Semi-Arid. Regarding educational attainment, the 2017 Agricultural Census conducted by the Brazilian Institute of Geography and Statistics (IBGE) reveals that, in 61.6% of agricultural establishments in the Semi-Arid, the managing producer cannot read or write or has never attended school.

To promote rural development in the face of structural challenges, Lemos (2012) argues that social assets, embodied in essential services for rural communities, need to be strengthened through government planning that directs social investments toward the provision of potable water for families and water of adequate quality for production; the provision of access to appropriate facilities for the disposal of human waste, either through the construction of septic tanks or the implementation of basic sewage systems; ensuring that rural families have access to regular household waste collection and proper disposal services; raising average educational attainment through the establishment of rural schools; and disseminating environmental education programs; the provision of family health programs to reduce to reduce infant mortality and rickets rates, as well as to promote healthy eating habits by teaching balanced nutrition across food groups (proteins, fats, vitamins, and minerals); the implementation of sexual education programs focused on family planning; and the establishment of public institutions in each municipality to ensure legal security and public safety for the population.

These ongoing investments resulting from government planning, by enabling democratic access to social assets, can become important and lasting complements to the monetary and non-monetary income derived from agricultural and non-agricultural productive activities.

To overcome the institutional challenge, the rural development agenda should include the empowerment of populations targeted by intervention policies designed to enable their development. These populations should have the freedom to determine their own destinies (Sen, 2000). Furthermore, institutions should work to make citizens' lives easier by responding more efficiently to their increasingly growing demands as society progresses.



An approach widely advocated in the literature to address the economic challenges of the Brazilian Semi-Arid is the adoption of an endogenous territorial development strategy based on the mobilization of local resources and potential. From this perspective, economic growth ceases to depend exclusively on the expansion of agricultural and livestock production and instead is driven by the diversification of productive activities, value addition to local production, the strengthening of family farming, innovation, entrepreneurship, and the improvement of territorial institutions.

Regarding pluriactivity, discussed in the previous section, and drawing on Schneider (2009), in the context of the Brazilian Semi-Arid, it should not be understood as a driver of development, but rather as a survival strategy, given the characteristic profile of production units: small production areas that are vulnerable to environmental degradation and adverse weather conditions. Producers in this region turn to pluriactivity out of economic necessity, in order to secure a minimum subsistence income and avoid the collapse of their production unit or migration to urban centers.

In this regard, Lemos (2012) adds that this strategy breaks with exclusive dependence on agricultural production, enabling coexistence with drought conditions, allowing for investments in water harvesting, and strengthening local productive capacities, thereby reducing economic vulnerability. All these outcomes generate a spillover effect that contributes to sustainable rural development by meeting the population's basic needs, as outlined in the preceding paragraph.

Therefore, the promotion of rural development in this region involves the ideas suggested by these authors to overcome this economic obstacle, which will be addressed through a constant flow of public and private investments, always seeking a technically and economically efficient allocation of renewable and non-renewable natural resources (Lemos, 2012).

Finally, there is the need to overcome the social challenge, a necessary condition for the territorial development strategies outlined thus far to produce lasting results. The literature converges on the view that investments in infrastructure and productive policies are important, but tend to be insufficient if they are not accompanied by the strengthening of the human and institutional capacities of rural territories.

Overcoming the social challenge in the Brazilian Semi-Arid requires policies capable of expanding human capabilities and strengthening the social assets of rural territories. From the perspective of contemporary rural development, sustainable economic growth depends on the formation of human capital, expanded access to education, professional training, technical assistance, productive inclusion, and the reduction of social inequalities.

According to Veiga (2001), rural development should promote improvements in the population's living conditions and expand opportunities for economic and social participation,



while Sachs (2008) argues that development can only be considered socially inclusive when it is economically and environmentally sustainable. In the Semi-Arid, this approach implies strengthening education, health, water security, digital inclusion, and access to public services as indispensable elements for enhancing rural families' adaptive capacity and reducing their vulnerability to climatic and economic adversities.

The literature highlights that the consolidation of rural development depends on strengthening social capital and territorial governance. Abramovay (2003) emphasizes that interpersonal and community relationships based on trust reduce coordination costs and encourage innovation. Complementarily, Schneider (2010) points out that this dynamic materializes at the institutional level when cooperatives, associations, and public authorities act in a coordinated manner in territorial management. In the context of the Brazilian Semi-Arid, overcoming low levels of social capital therefore presupposes the development of local governance capacities, an indispensable condition for transforming regional dynamization into an endogenous, inclusive, and sustainable process.

Beyond these challenges and the possibilities of overcoming them, Favareto (2010) points to obstacles such as the creation of new institutions capable of sustaining this new perspective on rural development. According to this author, these proposals were incorporated 'by addition,' with old values and practices continuing to dictate the course of events under a new guise.

According to Grisa (2021), conflicts of interest or sectoral priorities can be observed, particularly the focus on the agro-export sector, when efforts are made to innovate institutions and governance structures. This author, who analyzed sectoral planning for agribusiness and family farming during the FHC, Lula, and Dilma administrations, found that despite all the changes made regarding the development of public policies for family farming during these administrations, a significant continuity lies in the inequality of economic and political resources between the political categories of agribusiness and family farming. According to her, differences in the resources allocated to programs and credit lines are emblematic, revealing the unequal treatment provided by the State, a situation that was exacerbated by the lack of coherence among sectoral planning instruments.

The period analyzed was not sufficient to raise awareness among decision-makers, nor to establish the understanding that family farming plays a strategic role in this process. As demonstrated by Araújo, Sampaio, and Lima (2025), strengthening this segment through access to credit, technical assistance, innovation, and public policies is a fundamental element in promoting sustainable rural development and mitigating vulnerabilities in the Semi-Arid. Despite the limitations imposed by climate variability and socioeconomic inequalities, family farming remains highly relevant in productive and social terms, being responsible for the economic reproduction of



thousands of rural establishments and for generating employment, income, and food security in the region.

Therefore, despite advances in ideas, what can be observed in the reality of rural development in the Semi-Arid is the persistence of a reductionist and fragmented approach to combating droughts and their effects through large-scale water infrastructure projects and irrigation oriented toward the foreign market, and the concept of coexistence with the Semi-Arid, along with the appreciation of the knowledge and practices of the region's peoples, has not yet been sufficiently internalized in government programs and actions (da Silva, 2017).

6 Final Considerations

This article aimed to analyze the evolution of the main theoretical approaches to rural development, examining their applicability to the specific context of the Brazilian Semi-Arid, based on a literature review and a bibliographic survey covering the last sixty years.

The research was based on the observation that the region faces challenges related to water scarcity, vulnerability to climate change, poverty, and environmental degradation – factors that require the production of knowledge capable of supporting public policies aimed at sustainable development. At the same time, the Semi-Arid brings together potentialities associated with the biodiversity of the Caatinga, social technologies for coexistence with drought, and the adaptive capacity of local communities, making it an important laboratory for the formulation of strategies for innovation, food security, and the strengthening of socioeconomic resilience.

The results of this review confirm that models and practices of rural development developed in contexts outside the region – whether of Eurocentric or North American origin – cannot be uniformly applied without proper adaptation to the territorial reality of each region. This finding becomes even more evident when the Brazilian Semi-Arid is the subject of analysis. Successful experiences in other contexts can provide references and inspiration, but their uncritical transposition tends to overlook the environmental, social, and cultural specificities that condition development opportunities in the region. Thus, it was found that the driving force of local development must be endogenous – that is, based on the capacity of territories to mobilize their own resources, knowledge, and internal potentialities.

The literature review also revealed that the evolution of rural development theory is progressively converging toward a model in which the development of the Semi-Arid depends more on the articulation between human capital, social capital, institutions, innovation, sustainability, and the appreciation of local potentialities. This convergence highlights the evolution from a development framework based on combating drought and agricultural



modernization toward a multidimensional territorial model, adapted to the social, economic, and ecological specificities of the semi-arid region.

The central hypothesis guiding this study was confirmed: understanding the vulnerabilities of the Semi-Arid is fundamental to applying territorial-based and endogenous theoretical approaches, as they provide more appropriate foundations for the formulation of public policies capable of promoting more equitable and sustainable rural development. Scientific research plays an irreplaceable role in this process by developing solutions that integrate economic viability, social inclusion, and environmental conservation.

From the perspective of public policy implications, the results of this review point to fundamental guidelines. First, policies targeting the Semi-Arid should move beyond the paradigm of combating drought toward the paradigm of coexistence with the Semi-Arid, recognizing and valuing the region's territorial specificities – including the biodiversity of the Caatinga and social technologies for coexistence with drought. Second, investments in human capital – contextualized education, technical training, and access to healthcare – should be treated as a precondition for development, rather than as its consequence, given that deficits in this dimension constitute one of the main obstacles to economic dynamization in semi-arid territories. Third, strengthening local institutions and social capital is essential for territories to articulate their internal assets and enable sustainable endogenous development processes. Finally, policies that encourage pluriactivity and productive diversification – especially those that expand access to institutional markets, rural credit, and context-specific technical assistance – are essential for reducing rural families' vulnerability to droughts and promoting productive inclusion in a structural manner.

In view of the foregoing, the limitations of this study must be acknowledged. As this is a literature review covering a period of approximately sixty years, not all theoretical contributions available in the national and international literature were examined exhaustively, nor was an empirical analysis conducted using primary or secondary data on specific territories or municipalities in the Semi-Arid.

These limitations create opportunities for a future research agenda that combines the theoretical foundation consolidated in this study with empirical evidence – through multidimensional indicators of rural development, territorial case studies, and evaluations of public policy effectiveness – in order to advance the understanding of the concrete conditions that foster or hinder sustainable rural development in the Brazilian Semi-Arid.

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