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RIDES

A THEORETICAL-METHODOLOGICAL ESSAY FOR UNDERSTANDING SUSTAINABLE RURAL DEVELOPMENT: INTERFACES AMONG ACTORS, NETWORKS, DISCOURSES, AND TRANSLATIONS

Ensaio teórico-metodológico para compreender o Desenvolvimento Rural Sustentável: Interfaces entre Atores, Redes, Discursos e Traduções

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Abstract Studies of sustainable rural development (SRD) draw on theoretical approaches that examine economic factors, internal capacities, institutional dynamics, local knowledge, and power relations. The analytical division between opposing poles, such as endogenous and exogenous, local and global, structure and agency, and technical knowledge and practical knowledge, limits our understanding of rural dynamics. To overcome this limitation, we propose a methodological approach based on three theoretical frameworks: Norman Long's actor-oriented perspective, Karl Mannheim's documentary method, and the Actor-Network Theory of Michel Callon and Bruno Latour. Long provides analytical tools for examining individuals' capacity for action and the moments of negotiation and conflict. Mannheim enables access to conceptions formed through everyday work that do not appear explicitly. Callon and Latour make it possible to trace the construction of heterogeneous networks that bring together people, technologies, and resources. The integration of these approaches results in an analytical methodology that understands rural development as an open-ended process in which the local environment is continuously rearranged through its external connections.

Keywords: sustainable rural development; actors. Agency. Worldviews. sociotechnical networks. translation.

Resumo: *Os estudos do desenvolvimento rural sustentável (DRS) contam com correntes teóricas que analisam fatores econômicos, capacidades internas, dinâmicas institucionais, saberes locais ou relações de poder. A divisão analítica entre polos opostos — endógeno e exógeno, local e global, estrutura e ação, conhecimento técnico e saber prático — limita a compreensão das dinâmicas do campo. Para contornar essa limitação, propõe-se um caminho metodológico baseado em três referenciais: a perspectiva ator-orientada de Norman Long, o método documentário de Karl Mannheim e a Teoria Ator-Rede de Michel Callon e Bruno Latour. Long fornece elementos para observar a capacidade de ação dos indivíduos e os momentos de negociação e conflito. Mannheim permite acessar as concepções formadas no cotidiano de trabalho que não aparecem de forma explícita. Callon e Latour possibilitam acompanhar a construção de redes heterogêneas que associam pessoas, técnicas e recursos. A integração dessas abordagens, resulta em uma metodologia analítica que toma o desenvolvimento rural como um processo aberto, no qual o meio local se rearranja continuamente por meio de suas ligações externas.*

Palavras-chave: *desenvolvimento rural sustentável. Atores. Agência. visões de mundo. redes sociotécnicas. tradução.*

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INTRODUCTION

The transformations in rural areas over the past five decades have altered the questions posed by rural sociology. Agricultural modernization underpinned an interpretation in which technology, productivity, the market, and economic integration played a central role. Criticisms arising from the social and environmental consequences of this dynamic have spurred alternative interpretations of the countryside, focusing on local communities, family farming, producers' know-how, social organizations, and environmental conservation. The literature underpinning this article is situated within a broader theoretical transition, characterized primarily by a questioning of purely macrostructural explanations and also by the need to pay attention to everyday interactions, the choices made by individuals, and the heterogeneity of rural contexts – which become increasingly apparent as empirical contexts are examined more closely.

This shift in analytical focus has not resolved a persistent theoretical impasse. By directing attention toward the potential of territories, some research has come to emphasize endogenous development, while other studies have maintained their emphasis on external pressures linked to globalization, market dynamics, public policies, and technological transformations. The opposition between these two models has produced an analytical divide that is disconnected from the way rural processes are organized in practice. Buttel points out that an isolated reading of these two approaches limits our understanding of the countryside: the endogenous approach loses touch with broader economic processes, while the exogenous approach encounters obstacles in understanding power struggles and the initiatives developed in everyday life (Buttel, 1994).

The discussion becomes more complex when development incorporates the requirement of sustainability. Under these conditions, the analysis is not limited to verifying the allocation of financial resources and the actions of institutions, but seeks to understand how producers themselves define what should be preserved, altered, or produced in their environment. Sustainability involves distinct forms of knowledge, values, divergent interests, and disputes over the legitimate diagnosis of environmental and social problems. Pretty's contribution is drawn upon to demonstrate that sustainable agriculture functions as an open process, marked by negotiations and conflicts, rather than constituting a fixed set of techniques or equipment. (Pretty, 1995 and 2008).

For Jules Pretty (2008), advancing sustainable rural development (SRD) requires abandoning the idea that sustainability functions as a ready-made model or a fixed set of practices reproduced without modification. Sustainability operates as a continuous process of adaptation, learning, and adjustment, in which the outcome depends on the physical, social, economic, and institutional context of each locality. This perspective shifts the focus from the mere delivery of technologies to the capacity of communities to devise responses to real problems, acknowledging that different paths lead to viable outcomes. The author points out that increased productivity without soil degradation does not result solely from the acquisition of new inputs or machinery, but from the use of local knowledge, teamwork, and cooperation among those involved in soil and

water management. This interpretation aligns with the analytical approach of this article, which treats the DRS not as an endpoint but as a dynamic " " constantly adjusted by the relationships among farmers, institutions, technical knowledge, tools, and natural resources.

This is where the methodological problem of this article arises. If sustainable rural development consists of relationships among different actors and knowledge within distinct ecosystems, how can we investigate these relationships without reducing rural reality to an economic structure, a local culture, or a predefined institutional policy? How can we simultaneously understand the actors' capacity for action, the experiences that shape their interpretations, and the networks in which people, institutions, knowledge, and objects are interconnected?

The answer proposed in this article seeks to articulate three perspectives: A) Norman Long provides an actor-oriented approach capable of examining agency, arenas, battlefields of knowledge, and interfaces of sustainable rural development (SRD) projects. B) Karl Mannheim offers the documentary method to access worldviews and experiences that belong to the field of atheroretical knowledge shared by farmers. C) Michel Callon and Bruno Latour, through Actor-Network Theory, enable us to track sociotechnical networks, processes of translation, actor-worlds, and mechanisms of stabilization and destabilization of associations, thereby allowing us to understand the architecture of the networks constructed by rural communities and individual and collective actors.

This article seeks to transform this integration into a methodological proposal for thinking about sustainable rural development. The methodological hypothesis is that each perspective allows us to observe a dimension that remains partially invisible when analyzed through the others: Long enables us to identify the encounters and conflicts between actors; Mannheim allows us to interpret the practical orientations and worldviews that underpin these encounters; and Actor-Network Theory encourages us to track the shifts and associations that transform relationships into sociotechnical networks. The methodology does not seek to merge the three theories into a new general theory; rather, it seeks to establish among them an analytical division of labor in decoding SRD projects and in designing new interventions.

To illustrate how the three theoretical perspectives can operate in an integrated manner in empirical analysis, we have constructed a hypothetical case based on dynamics repeatedly documented in the literature on rural development, agroecology, and university extension (BOX 2. Section 6.4). The case follows the implementation of a sustainable rural development proposal in a territory where farmers and extension agents interact based on different interests, knowledge, and approaches to implementing agroforestry. This situation allows us to observe how a proposal initially formulated in technical and institutional terms is reinterpreted by the actors, confronted with local knowledge and experiences, and progressively modified through the interactions that take place within the territory. At the same time, it allows us to identify how different human and non-human elements participate in the constitution of the network, how certain actors seek to articulate interests, and how these articulations produce moments of stabilization, controversy, and reconfiguration. The objective of this case study is not to reproduce a specific empirical experience, but to

make visible, within an analytically controlled setting, how agency, worldviews, interfaces, discourses, networks, and translations can be examined together in the analysis of the construction of sustainable rural development.

THEORETICAL FRAMEWORK

Rural Development and Overcoming Dichotomies

The opposition between endogenous and exogenous development has become a recurring theme in the debate on rural development. The exogenous model, associated with modernization strategies, tends to locate the main drivers of development outside rural localities, emphasizing economic integration, technology, capital, and external institutions. The endogenous model, in turn, shifts the focus to the resources present in the localities, to the participation of local actors, and to internally developed identities, knowledge, and capacities. These perspectives are not merely different models of intervention but also different ways of understanding where the forces capable of producing change are to be found (Alves, 2008).

The problems with this mechanical opposition become apparent when we observe empirical realities in the field. A rural locality can hardly achieve its own development without establishing relationships with external institutions; this includes a range of elements such as public policies, markets, technologies, organizations, and knowledge flows. At the same time, these external elements do not enter a locality as pure and unchanging forces. They are appropriated, rejected, reinterpreted, and transformed by the actors. The relationship between the local and the external thus constitutes a process of mediation rather than a simple transfer.

This debate also fits into discussions about globalization. Buttel (1994) warns that the opposition between globalization and relocalization reproduces similar analytical limitations: the former overestimates macrostructural forces, while the latter idealizes local adaptive capacity without linking it to broader processes. The neo-endogenous perspective overcomes this separation by investigating how localities mobilize internal resources and simultaneously negotiate with external forces, making the relationship between the local and the extra-local the central focus of analysis (Ward et al., 2005; Lowe, Murdoch, & Ward, 1995).

This discussion provides the first foundation for the proposed methodology. Rural development should not be preemptively classified as endogenous or exogenous. As researchers, we must investigate how elements from different scales are incorporated into local practices and how the actors themselves transform what they receive from outside. The object of analysis ceases to be a development model and becomes the relationship between actors, resources, knowledge, and institutions in concrete situations.

This analytical shift paves the way for an actor-oriented approach. In other words, if development arises from the interplay of diverse forces, it becomes necessary to identify the actors who interpret these forces, negotiate with them, and act upon them. The question is no longer merely which structures determine rural development but

also includes how actors process these conditions and transform their possibilities for action.

Sustainability as a Social Process

Furthermore, sustainability introduces another layer of complexity because the term does not have a single, fixed meaning. The discussion presented by Pretty views sustainable agriculture as an open process, subject to negotiations and conflicts, which requires the development of new skills and competencies so that actors can actively participate in development policies (Pretty, 1995; 2008)

This conception changes the way the problem of sustainability is framed. If sustainability does not correspond to a closed set of technologies, it also cannot be treated simply as an objective property of a particular agricultural practice, such as agroecology. The meaning of sustainability, as defined and observed by the subjects, comes to depend on the social relationships through which actors mobilize to define problems, assess consequences, and establish priorities. In this context, the very process of definition constitutes the object of study.

This does not mean that all interpretations have the same content or that scientific criteria should be abandoned. It means that the researcher must observe how different criteria are mobilized by actors in the concrete situations that emerge from these interactions. An environmental problem may be interpreted by a farmer based on his or her productive experience, by a technician based on agronomic parameters, by a social organization based on a particular conception of autonomy, and by a public institution based on normative indicators. Thus, an analysis of sustainable development must understand how these interpretations relate to one another.

Box 1. Methodological Assumptions for Analyzing Sustainable Rural Development

1. **Sustainable rural development is a relational process.** It does not result from the linear application of policies or technologies, but from the interactions established among actors, institutions, knowledge, material resources, and environmental conditions.
2. **Actors possess agency**. Farmers, technical experts, organizations, public managers, and other participants continually interpret, negotiate, and transform development proposals, producing outcomes that cannot be predicted solely by the policies formulated.
3. **Worldviews guide practices**. Actors' decisions are influenced by knowledge derived from everyday experience, values, memories, and their own ways of interpreting reality---which often remain implicit in public discourse.
4. **Development processes take place in arenas of negotiation**. Development is constructed at interfaces where different interests, rationalities, forms of knowledge, and projects come into contact, establishing relationships of cooperation, conflict, and mediation.
5. **Sociotechnical networks organize collective action.** Development emerges from the association between people, institutions, technologies, norms, natural resources, documents, and other elements that act together to shape social practices.
6. **Translations produce stability or change**. Actors seek to mobilize other participants, redefine problems, build consensus, and stabilize certain network configurations. These processes remain provisional and can be continuously reconfigured.
7. **Sustainability is a dynamic construct.** Rather than representing a final state or a single model, the DRS results from ongoing processes of learning, adaptation, negotiation, and reorganization of the relationships between society, the economy, and the environment.

Source: Synthesis of central ideas from Long, Mannheim, Callon, and Latour. Organization: Prepared by the author.

Guivant identifies a convergence between environmental sociology and Actor-

Network Theory precisely in this regard, noting that both allow us to challenge rigid distinctions between the social and the natural and between the sociological and the scientific, in addition to considering decision-making processes in situations of risk and uncertainty (Guivant, 2002). Sustainability, in this sense, is not merely the outcome that a project must achieve. It is also produced through relationships that define the problem, select knowledge, establish criteria, and distribute responsibilities. This understanding brings environmental issues closer to the analysis of power and knowledge relations.

ACTORS AND AGENCY: NORMAN LONG'S CONTRIBUTION

Norman Long offers, through his actor-oriented approach, the first tool for shifting the analysis from abstract structures to concrete relationships (see Table 1). His primary concern is to understand the social changes produced in intervention processes, taking into account human agency, self-organizing processes, and the relationships between internal and external actors. The goal is not to deny the existence of institutions and power relations, but to understand how they are interpreted and enacted by individuals in concrete situations (LONG, 2001; ALVES, 2008).

Agency, from this perspective, should not be confused with absolute autonomy. Actors operate within conditions they have not entirely chosen, but they possess the capacity to interpret experiences, mobilize resources, negotiate positions, and reorganize their projects. This capacity means that the implementation of a development proposal never corresponds exactly to the execution of a previously drawn-up plan.

Table 1. Long´s main categories used for analyzing SDR

Category	Meaning from Long's perspective	Use in the analysis of rural development
Social actors	Individuals who interpret situations, formulate projects, and act upon the conditions in which they are embedded. [1]	This approach allows for the analysis of farmers, technicians, organizations, public officials, and other participants as active agents in the development process.
Agency	The capacity to interpret experiences, mobilize knowledge and resources, and act within specific social conditions. [1]	This enables us to understand how actors rework development proposals and produce outcomes not initially anticipated.
Actors' projects	Intentions, interests, and strategies that guide the actors' actions. [1]	One must identify different development projects that coexist and may eventually come into conflict.
Arenas	Social spaces in which actors, interests, and projects meet, negotiate, and come into conflict. [1]	Cataloging and empirically locating the spaces of negotiation and conflict.
Battlefields of knowledge	Spaces in which different forms of knowledge, values, and interpretations of reality are confronted. [2]	Encourages the analysis of disputes over what should be recognized as valid knowledge to guide development.
Social interface	A situation where different social worlds meet, marked by differences in interests, knowledge, and	It constitutes a central category for observing how development proposals are negotiated, reinterpreted, and

	interpretations. [1]	transformed.

Fonte: LONG, N. Development Sociology: Actor Perspectives, 2001; Long, N.; Long, A. (eds.). Battlefields of Knowledge, 1992. Elaborado pelo autor.

Long draws attention to the fact that participants arrive at intervention situations with pre-existing experiences, political positions, and expectations. They are not empty vessels for external proposals. The encounter between different projects alters the course of the intervention and produces results that cannot be explained solely by the initially established objectives (Long, 2001; Alves, 2008).

This shift is crucial for a methodology of sustainable rural development. If actors enter the process with their own projects, then the researcher must reconstruct these projects before assessing their participation. It is necessary to understand what each actor seeks to achieve, what resources they consider available, what knowledge they recognize as valid, and what relationships they intend to establish.

Actor-oriented analysis thus leads to a relational conception of agency. The capacity for action emerges in relation to other actors and to the material and institutional conditions in which projects unfold. This is not a matter of replacing structure with individual action, but rather of investigating how structures , and relationships are experienced, interpreted, and transformed in practice.

Arenas, Battlefields of Knowledge, and Interfaces

Agency manifests itself in specific social situations. Long draws on the concept of the arena to analyze the spaces in which actors and institutions compete over issues, resources, values, and representations. In the study of development projects, arenas should not be understood as exclusively local or face-to-face spaces. They can connect geographically distant actors and articulate relationships that span different scales and timeframes (LONG, 2001). This formulation is particularly well-suited to contemporary rural development. A seemingly local decision may be related to a national policy, an international organization, a market, a certification system, or a technology developed elsewhere. The local arena is therefore not an isolated space. It constitutes a point of articulation between relationships that extend beyond it.

It is in these arenas that the so-called "battlefields of knowledge" emerge. The actors do not merely arrive with differing interests; they also bring with them distinct experiences, values, knowledge, and ways of interpreting the world. Long views knowledge as provisional, partial, and contextual, which implies recognizing the coexistence of different ways of organizing and understanding reality (Long; Long, 1992).

Conflict, therefore, can arise over what should be recognized as legitimate knowledge. A technical proposal, knowledge derived from agricultural experience, an institutional indicator, or an environmental interpretation may occupy distinct positions within the same arena. The researcher must observe how these forms of knowledge are presented, negotiated, and eventually incorporated into decisions.

The category of "interface" deepens this analysis because it allows for an

investigation of the encounter between different social worlds. For Long, interfaces are spaces in which discrepancies in interests, knowledge, and interpretations are confronted and negotiated. They allow us to observe how a planned intervention is reinterpreted and transformed by the actors involved in it (LONG, 2001). The concept has an important methodological implication: the intervention must be deconstructed. The researcher does not start from the assumption that the project has a single meaning that will later be accepted or rejected by the participants. Instead, the researcher tracks what happens when the proposal encounters different actors. It is in this encounter that objectives are modified, roles are renegotiated, knowledge is selected, and new relationships are built.

The interface thus becomes one of the main points of observation in research on sustainable rural development. It is here that the researcher can perceive how an abstract conception of sustainability may or may not be transformed into concrete practices and how these practices, in turn, can alter the initial conception itself.

WELTANSCHAUUNG AND ATHEORETICAL KNOWLEDGE: MANNHEIM AND THE DOCUMENTARY METHOD

The analysis of arenas allows us to identify where different actors meet and contest interpretations. It remains to be understood how these actors make sense of their experiences. It is at this point that Karl Mannheim's contribution complements Long's approach.

In the 1920s, in a seminal text, Mannheim understood the Weltanschauung (worldview) as the result of experiences and lived realities linked to a structure that constitutes a common foundation for experiences spanning the lives of multiple individuals. A worldview should not be confused with an image of the world or with a conscious theoretical formulation. It is constituted, sometimes chaotically, through practical actions and belongs to the realm of a-theoretical knowledge (that is, knowledge that has not yet been theorized), necessitating a process of (theoretical) interpretation that transforms these experiences into an object of scientific knowledge intelligible in light of categories and classifications (Weller et al., 2002).

This distinction offers an important avenue for the analysis of rural development. Actors may explain their own actions using categories available in public discourse, but these explanations do not necessarily exhaust the meanings embedded in the practices. A decision regarding a particular technology, a way of participating in an organization, or a rejection of a certain policy may carry historical experiences that are not theoretically formulated by the actor themselves.

Table 2. Main categories of Karl Mannheim used

Category	Meaning from Mannheim's Perspective	Use in rural development analysis
Weltanschauung / worldview	A structure of experiences and orientations that constitutes a socially situated way of understanding the world. [1]	It allows for the investigation of collective orientations that influence the way actors interpret development and sustainability.
Atheoretical knowledge	Knowledge constituted through practical experience prior to its	It makes it possible to access knowledge

	systematic formulation as theory. [1]	embedded in rural practices that does not necessarily appear as formalized discourses.
Immanent meaning	That which appears directly in an action, object, gesture, or discourse. [1]	It constitutes the first level of empirical interpretation.
Expressive meaning	That which is manifested by the actor through words or actions. [1]	It allows for the analysis of the explanations and expressions produced by the participants.
Documentary meaning	The meaning that an action or cultural production documents regarding a social orientation that goes beyond its explicit intention. [1]	It allows for the investigation of dimensions of rural practices that are not necessarily consciously formulated by the actors.
Documentary method	An interpretive procedure that seeks to reconstruct the documentary meaning of practices. [2]	It relates discourses, practices,and experiences to understand the orientations that underpin the actors' actions.

Source: 1) Mannheim, K. Beiträge zur Theorie der Weltanschauungsinterpretation, 1952; 2) Bohnsack, R. Pesquisa Social Reconstruitiva, 2020. Prepared by the author (2026).

In the 1990s, Bohnsack revisited and updated Mannheim's documentary method precisely to transform it into a tool for empirical social research. The shift consists of moving beyond merely reconstructing the course of an action to reconstructing its meaning within the social context in which it occurs (Bohnsack, 2020). The documentary method thus allows research to go beyond what the actor explicitly says about their action, moving toward the underlying meanings of the action. Mannheim distinguishes three levels of meaning: the objective or immanent, the expressive, and the documentary. The first corresponds to what appears directly in the object or action; the second considers what is expressed through words or actions; the third seeks to understand the action as a document of a social practice and orientation (Mannheim, 1952; WELLER et al., 2002).

The difference between these levels does not mean that the former should be discarded. They constitute stages in reaching the documentary level of meaning. Weller et al. observe that the expressive and objective levels of meaning are necessary for interpretation, but the documentary level of meaning allows one to access dimensions of ethos and worldview that are not necessarily present in the actor's conscious intention (Weller et al., 2002).

The a-theoretical dimension also prevents the analysis from treating everyday experiences as trivial or unelaborated data. Mannheim argues that seemingly simple experiences are constitutive of social structures and possess historicity. Neglecting them results in a partial understanding of the social environment, because what appears as immediate experience is related to different temporalities and historical conditions (Weller et al., 2002).

When applied to sustainable rural development, this approach makes it possible to ask not only what actors say about sustainability or a particular project, but also what experiences and practical insights are revealed by their actions. The analysis then

considers the relationships between discourse and practice, between conscious explanation and embodied experience, and between the current situation and the temporalities that shaped it. The use of this technique allows the researcher to access broad aspects of the actors' worldviews that would remain invisible if, for example, a closed-ended questionnaire were used.

This contribution complements Long's work precisely. Long allows us to identify the interface at which the actors meet; Mannheim allows us to investigate the experiences and orientations that each actor brings to that interface.

FROM THE INTERFACE TO THE NETWORK: THE CONTRIBUTION OF ACTOR-NETWORK THEORY

Long and Mannheim's analysis allows us to understand actors, conflicts, experiences, and worldviews. It is still necessary to track what happens to these elements when they enter into broader relationships. It is at this point that Actor-Network Theory (ANT), developed by Michel Callon and Bruno Latour, offers a third analytical dimension. ANT emerged in the 1980s from studies in science and technology and developed a critique of conventional ways of explaining the production of scientific knowledge; to this end, it constructed a rich theory and provides key concepts for operationalizing its application (Table 3). In the framework presented, the theory incorporates the concept of translation associated with Michel Serres and the principle of symmetry related to David Bloor, subsequently expanding on these contributions to challenge rigid separations between society and nature, science and non-science, and humans and non-humans (Alves, 2008).

The principle of generalized symmetry is relevant to rural development because it allows us to avoid a premature separation between social and technical elements. A development network may involve farmers, technicians, organizations, researchers, and public agencies, but it may also include seeds, documents, indicators, technologies, financial resources, and management mechanisms. The analysis should not decide in advance that some of these elements are mere instruments and others are the true agents of change. It should track the associations through which they come to participate in the process. Mior and Guivant bring this perspective closer to the study of social change and rural development processes by working with sociotechnical networks (Mior, 2003; Mior & Guivant, 2005). Murdoch, in turn, examines the spaces constituted by networks in Actor-Network Theory, contributing to an understanding of the relationships between networks and spatiality (Murdoch, 1998).

From this perspective, the concept of a network does not simply refer to a set of actors that already existed and subsequently established connections with one another. For Latour, the network itself is produced by these associations. This means that research must track the processes through which actors, objects, discourses, and resources come to participate in a common, " " configuration. This formulation aligns with Long's focus on interfaces but introduces another dimension. Long helps us understand the encounter and conflict between social worlds. TAR allows us to trace what is produced following this encounter: which associations are established, which elements are displaced, which roles are assigned, and how a network attempts to

stabilize itself.

Translation and the Constitution of Networks

The concept of translation lies at the heart of this contribution. For Callon, to translate means to express in one's own language what other actors say and want, to understand why they act in a certain way and how they associate with one another, thereby establishing oneself as a spokesperson (CALLON, 1986). Translation does not mean the neutral transmission of a message. As Callon observes, the translator also reduces and transforms what is being translated, incorporating their own assumptions, interests, and interpretations into the process.

Translation thus implies a shift in meanings and positions, through which the elements mobilized within the network are redefined according to the relationships established among the actors. When an actor translates another's interest, they alter the way in which that interest appears within the network. Translation can take on different roles: a claim can be transformed into a project; an experience can become a technical argument; a demand can be converted into an indicator; a local practice can be incorporated into an institutional policy, and so on.

Callon distinguishes four stages in the process of translation: problematization, interessement, enlistment, and mobilization (Callon, 1986). In problematization, an actor seeks to define a problem and present a solution whose implementation depends on him or her, thereby seeking to make himself or herself indispensable to the others. Interessement involves mechanisms designed to anchor the participants' interests around the proposed definition. Enlistment corresponds to the assignment and negotiation of roles, while mobilization involves the processes through which certain actors come to speak on behalf of others.

These stages should not be viewed as a rigid sequence. The translation process itself is unstable and susceptible to fluctuations. These shifts involve goals and interests, but also human beings, notes, theoretical resources, prestige, needs, interpretations of reality, mechanisms, and historical elements (Alves, 2008). This is why translation is a particularly useful tool for studying sustainable rural development. A project does not merely bring together actors who already have defined interests. Throughout its implementation, it can modify these interests, produce new identities, redefine problems, and create new relationships between previously separate elements. The process of translation thus allows us to track the simultaneous transformation of actors and networks.

Actor-world, representation, and stabilization

Translation leads to the concept of the actor-world. The actor-world is one who seeks to express and organize the interests of other actors, becoming a conduit for claims, needs, and interpretations. In doing so, they classify, reposition, adjust, and unify elements of the network into new roles and realities (Callon, 1986; Alves, 2008). This position should not be confused with formal authority. An actor may become central because they are able to connect different elements and produce a definition of

the problem capable of mobilizing other participants. Their centrality depends on the network they are able to build and maintain.

Problem-framing is especially important in this process because the actor who defines the problem also seeks to define the conditions for its solution. By establishing an issue as a problem and presenting a solution, the aspiring "world-actor" seeks to make others recognize the need to go through their mediation (Callon, 1986). This mechanism helps us understand power relations that do not necessarily appear as direct impositions. Power may lie in the ability to define categories, organize information, produce diagnoses, represent other actors, or establish which paths will be considered legitimate.

Table 3. Main categories of TAR operationalized in the analysis

Category	Meaning	Use in Rural Development Analysis
Generalized symmetry	Symmetrical analysis of social, technical, and natural elements, without establishing a hierarchy among them *a priori*.[1]	Enables the joint analysis of farmers, institutions, technologies, documents, resources, knowledge, and environmental elements.
Sociotechnical network	An association of heterogeneous entities participating in a common action.[1] [2]	Makes it possible to reconstruct how different elements are connected in the constitution of rural development processes.
Translation	Process through which interests, identities, objectives, and relationships are displaced and transformed.[1]	Facilitates tracing how development proposals are reinterpreted and appropriated by different participants.
Problematization	Definition of a problem and establishment of a solution in which a particular actor seeks to become indispensable.[1]	Enables investigation of who defines development problems and which solutions are presented as necessary.
Obligatory passage point (OPP)	Situation in which an actor seeks to make its mediation necessary for others to achieve their objectives.[1]	Enables the analysis of processes of centralization and power in the constitution of networks.
Interessement	Mechanisms used to secure actors in the roles defined during problematization.[1]	Makes it possible to analyze strategies for mobilizing actors and stabilizing relationships.
Enrolment	Definition and negotiation of the roles assigned to different actors.	Enables tracing how responsibilities and positions are distributed within the network.
Mobilization	Process through which actors are brought together and represented by spokespersons.[1]	Enables the analysis of representation, delegation, and the construction of collectivities.
Actor-world	An actor that seeks to articulate and represent the interests of other participants, becoming a focal point for the network's relationships.[1]	Helps identify actors or organizations capable of centralizing problem definition and coordinating solutions.

Source: Callon, M. Some Elements of a Sociology of Translation, 1986; LATOUR, B. Reassembling the Social, 2005. Prepared by the author (2026).

The network, however, remains fragile. Translation is never a definitive achievement. Actors maintain other connections, can establish new relationships, and can alter the roles initially assigned to them. The centrality of a world-actor does not guarantee the network's permanent stability, because participants remain connected to other institutions and networks (Alves, 2008).

This aspect allows us to draw a parallel once again between TAR and Long's work.

The interface reveals the point where different projects come into contact; translation reveals how this contact produces shifts and new associations. The instability of the network corresponds, in a certain sense, to the continuity of the negotiation processes identified by the actor-oriented approach.

A METHODOLOGY FOR ANALYZING SUSTAINABLE RURAL DEVELOPMENT

The articulation of these three perspectives allows for the formulation of a methodology that begins before the evaluation of a project's results. The first step consists of reconstructing the context in which the development process takes place. This means considering relationships among scales, institutions, markets, policies, knowledge, and local conditions without first classifying them as internal or external. The neo-endogenous perspective provides a starting point here by showing that rural development arises from the interaction between local capacities and extra-local forces (Ward et al., 2005; Lowe, Murdoch, & Ward, 1995).

The second approach focuses on identifying the actors and their projects. The central question is not simply who formally participates in the process, but who effectively influences its trajectory. Institutional actors, organizations, farmers, technicians, researchers, public officials, and other participants capable of altering relationships must be considered. For each, it is important to reconstruct their experiences, interests, resources, knowledge, and projects, seeking to understand how these dimensions guide their actions.

The third step is to locate the arenas and interfaces where these projects intersect. The analysis must examine situations of negotiation, conflict, accommodation, and learning. It is not enough to simply identify that two actors hold different positions. It is necessary to observe how this difference is produced and how participants seek to legitimize their interpretations. The concept of the "battlefield of knowledge" allows for a precise analysis of this dimension, while the "interface" offers a privileged vantage point for observing the transformation of interventions (Long, 2001; Alves, 2008).

The fourth step involves reconstructing the worldviews that guide practices. At this stage, the researcher moves beyond simply asking what participants say about their actions and seeks to understand what these actions reveal about shared experiences, collective orientations, and social temporalities. The documentary method provides the tools to move from objective and expressive meanings to documentary interpretation, reaching dimensions of a-theoretical knowledge that remain partially hidden in the subjects' conscious explanations (Weller et al., 2002).

The fifth step involves tracking discourses and translations. The researcher must monitor how certain problems are named, what interests are associated with them, how actors are recruited, what roles are assigned to them, and how interpretations shift throughout the process. The question shifts from merely which discourse dominates to how a discourse manages to circulate and produce associations.

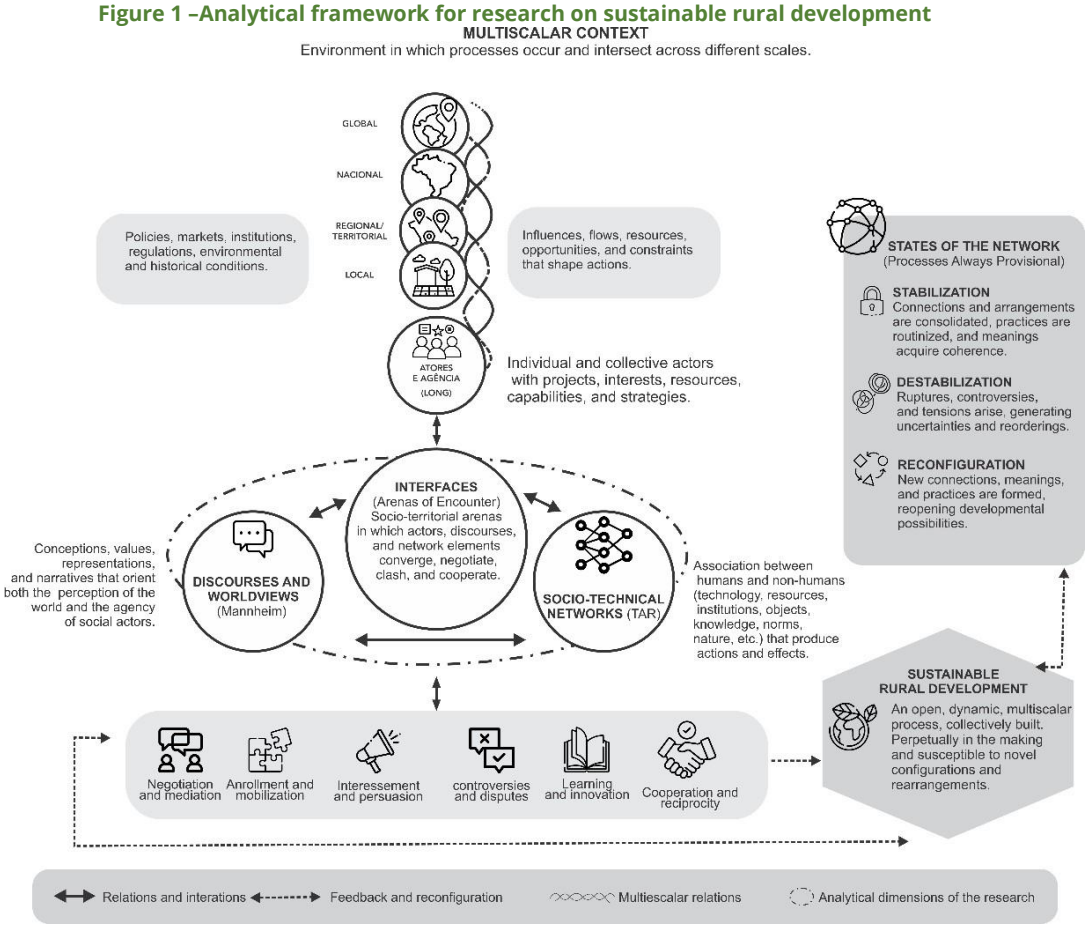
The sixth step allows for the reconstruction of the sociotechnical network. It is at

this point that human and non-human elements---such as documents, technologies, resources, indicators, equipment, knowledge, and institutional mechanisms---come into play. The methodological question is to examine what happens when each element enters the network, what relationships it produces, which roles it modifies, and what associations it makes possible.

Figure 1 presents a proposed analytical framework for research on sustainable rural development. The diagram begins by grasping the multiscale context, moves on to identifying the actors and their agency, and then leads to an analysis of the arenas and interfaces where conflicts, negotiations, and encounters between different social worlds manifest themselves. The framework then shifts to the reconstruction of the worldviews and discourses that guide the actors' practices, followed by an analysis of the sociotechnical networks and translation processes that transform interests, identities, and problems into stable or unstable associations. Finally, the diagram culminates in the mechanisms of stabilization and destabilization of networks, which produce the continuous reconfiguration of sustainable rural development.

The bidirectional arrows connecting all stages of the pathway indicate that the direction of relationships is reversible: a change in the network can alter an actor's position; a change in an actor's position can transform an arena; a new experience can modify a worldview; a new discourse can generate a different translation. The methodology, however, should not be interpreted as a linear roadmap or a sequential research protocol.

Figure 1 –Analytical framework for research on sustainable rural development



Source: Prepared by the author (2026).

It offers a representation of movement in which each dimension can be revisited in light of the transformations observed in the others, reflecting an understanding of sustainable rural development as a process of permanent, open, and relational reconfiguration.

How to Apply the Methodology in Empirical Research

The operationalization requires combining different sources because no single type of material allows to observe the entire process on its own. Documents, interviews, observations of interactions, and technical materials must be analyzed in an integrated manner. Documents can be treated simultaneously as sources of information and as elements of the networks themselves. Thus, projects, reports, and descriptive documents such as minutes, etc., not only describe a reality but also classify actors, define problems, organize responsibilities, and establish categories that can classify and guide subsequent practices. From this perspective, the analysis becomes more in-depth, and one must ask what the document reveals and what reality it helps to construct.

Interviews provide access to the interpretations produced by participants, but they must be analyzed in relation to practices. Mannheim's perspective recommends paying attention to the gap between the conscious explanation of an action and what the action reveals about collective experiences and orientations. For this reason, isolated interviews do not necessarily constitute the best unit of interpretation. Their meaning can be deepened when compared with observed situations and other accounts.

Observing situations of interaction allows for the reconstruction of interfaces. Meetings, technical activities, community gatherings, and informal situations can reveal negotiation processes that do not appear in formal documents. It is in these situations that shifts in position, disputes over legitimacy, and changes in the roles assigned to actors can be identified. Reconstructing networks requires tracking the elements that connect these different sources. An indicator can alter a decision; a document can consolidate a classification; a technology can modify a practice; a financial resource can enable a partnership; an organization can assume the representation of a group. The goal is not to produce an inventory of elements, but to reconstruct the relationships that give them the capacity to influence the process.

Interviews, for example, can be analyzed at three levels: identification of projects and agency (Long), reconstruction of worldviews and documentary meaning (Mannheim), and mapping of translations and associations (TAR). The same approach applies to documentary analysis and observation, allowing different sources to be examined through distinct theoretical lenses.

This methodology can be applied to various aspects of sustainable rural development, ranging from public policies and territorial projects to initiatives in family farming, agroecology, environmental conservation, marketing, technological innovation, or community organization.

Sustainable Rural Development as a Process of Translation

The proposed theoretical framework allows for a specific understanding of sustainability. If sustainability is an open-ended process, as Pretty (2008) suggests, and if development proposals are transformed by the relationships among actors, as Long (2001) demonstrates, then what will be considered sustainable is not entirely defined at the outset of the process. This statement does not mean that sustainability is merely a discursive construct; obviously, environmental, economic, and material conditions exist independently of the actors' interpretations. What is at issue is the way in which these elements are understood and transformed into social problems, decision-making criteria, and intervention practices.

It is at this point that translation takes on a methodological function. When an actor defines a particular problem as environmental, economic, or social, they are not merely describing a reality. They seek to establish relationships between different elements and to chart a specific course of action. Translation transforms problems into relationships and relationships into possibilities for intervention. Sustainability can, therefore, be understood as a provisional outcome of a network of translations. In this way, a particular practice becomes sustainable because actors, knowledge, institutions, instruments, and objects are associated in a specific manner; however, if these associations change, the definition of sustainability provided by the network may change.

Mannheim's contribution prevents this process from being interpreted solely at the discursive level, since worldviews and everyday experiences shape how actors interpret changes. Long, meanwhile, allows us to locate these interpretations in the arenas and interfaces where they are negotiated. TAR enables us to track the shifts that transform these negotiations into networks. It is precisely in this articulation that the proposal acquires its specificity.

Criteria for Validating Interpretations

Também é importante observar que esta proposta metodológica não busca a validação por amostragem estatística nem a generalização de dados. Por se tratar de um estudo qualitativo voltado para a reconstituição de relações sociais, o teste das interpretações depende de critérios adequados ao material de campo e aos conceitos teóricos adotados. A avaliação dos resultados apoia-se em quatro procedimentos: A) triangulação de fontes e métodos, B) saturação teórica e C) verificação junto aos participantes e rastreabilidade dos passos de análise.

Triangulation of Sources and Methods

It is also important to note that this methodological proposal does not seek validation through statistical sampling or the generalization of data. As this is a qualitative study focused on the reconstruction of social relations, the testing of interpretations depends on criteria appropriate to the field data and the theoretical concepts adopted. The evaluation of the results is based on four procedures: A) triangulation of sources and methods, B) theoretical saturation, and C) verification with

participants and traceability of the analytical steps.

Theoretical Saturation

Theoretical saturation, conceptualized by Glaser and Strauss (1967), determines the point at which data collection should be concluded. In this sense, the end of data collection does not occur simply because sources have been exhausted, but rather at the point where new materials cease to alter the understanding of the categories of analysis. Fieldwork continues until the information regarding worldviews (Mannheim), the formation of networks (TAR), and local negotiations (Long) reaches the stability necessary to support the interpretation. Saturation is achieved when the observed facts begin to recur within the anticipated patterns.

Validation with Participants

Validation with participants (member checking) is a mandatory step in research focused on the actions of actors. The procedure consists of presenting the provisional conclusions to the research subjects themselves to verify whether the descriptions of disputes, agreements, worldviews, and negotiations make sense to those who experienced the events. This feedback does not eliminate the difference between the researcher's perspective and the actor's account, but it prevents the application of theoretical frameworks that are alien to the local reality.

Traceability of the Interpretive Process

Auditability requires a clear account of all choices made throughout the research process, from the selection of interviewees and documents to the formulation of conclusions. This accountability includes presenting the sampling criteria, text coding procedures, and the link between concepts and field data, as well as indicating any changes in the research direction. For Actor-Network Theory, this detailed record allows the reader to follow, step by step, the association between human and non-human elements, as well as the stages of negotiation within the project.

Internal Validation and Theoretical Consistency

Consistency between theoretical concepts and the collected data serves as the final criterion for the model's validity. Conclusions regarding arenas of contestation, alliance networks, discourses, and agreements must be consistent with the theoretical foundations of each author cited. This correspondence is assessed by the alignment between theory and field evidence and by the logical coherence of the arguments. This internal validation operates in conjunction with the other verification criteria, ensuring that the research process – from the identification of subjects to the transformations in local networks – follows a consistent line of reasoning without contradictions.

A Brief Demonstration of the Methodology's Application

To illustrate how the three theoretical perspectives can operate in an integrated manner in empirical analysis, we present below a synthetic case study, constructed from dynamics repeatedly documented in the literature on rural development, agroecology, and university extension. Its function is purely demonstrative: to highlight how the same empirical data can be examined simultaneously through the three theoretical lenses employed in this article. The case serves an exclusively illustrative purpose and does not replace in-depth empirical analysis.

Box 2 - Description of a Hypothetical Case and Methodological Applicability

The "Sustainable Palm" Project was conceived by a university extension team to promote agroecological transition in a land reform settlement in southern Brazil. The proposal called for the gradual replacement of conventional soybean cultivation with diversified agroforestry systems (AFS), accompanied by periodic technical assistance, the distribution of native seedlings, and the formation of a marketing cooperative.

After 18 months of implementation, the evaluation team recorded the following data at a community review meeting: Of the 45 participating farmers, only 12 had implemented the agroforestry systems according to schedule. The rest continued to grow soybeans or reduced the transition area.

1- During the meeting, one farmer stated: "This agroforestry business looks good on paper, but here the land is ours, and the bank only understands soybeans. Who's going to pay my bills if I plant trees?" Other farmers nodded in silence.

2- The cooperative was formally established, but only three families delivered products for sale. The rest cited a lack of time and transportation infrastructure.

Integrated Data Analysis

Long's actor-oriented approach allows us to identify the actors, their projects, and the arenas where they meet and negotiate. The low uptake of the SAFs, the farmer's statement, and the cooperative's low participation are evidence that the extension program's proposal interacted with preexisting projects and was reinterpreted by the actors. The six farmers who joined the SAF interpreted the proposal as compatible with their projects; the others reworked the proposal based on their own priorities---credit, risk, and market---producing results not foreseen in the initial planning.

Mannheim's documentary method allows us to access worldviews and practical orientations that do not appear in formal discourses. The farmer's statement---"The land is ours, and the bank only understands soybeans"---documents a practical orientation that links financial stability, social recognition, and autonomy to soybean cultivation. The partial rejection of the SAF and the cooperative reflects historical experiences not theoretically articulated by the actors, revealing a worldview that values individual autonomy and a direct relationship with the market over collective action.

Actor-Network Theory makes it possible to track the associations and translations that stabilize or destabilize networks. The SAFs, the bank, the seedlings, the schedule, the cooperative, and the farmers are heterogeneous actors whose relationships produce the current configuration. The low level of adherence indicates that the translation proposed by the team (SAF = sustainability) failed to enlist the other elements of the network: the bank (which finances soybean production), the schedule (which did not take the local agricultural cycle into account), and the seedlings (which arrived outside the planting season). The cooperative is a "world-actor" in a translation process that has not been completed: it exists on paper but not in practice, because the elements that should stabilize the network---transportation, logistics, trust, and regularity of production---were not effectively brought on board.

Taken together, the three lenses build a more robust understanding than an isolated analysis: the problem is not a "lack of awareness" among farmers, but a relational configuration in which the agroecological proposal has not yet found a translation compatible with the actors' projects and the worldviews that guide their practices. The interface between the team and the farmers produced shifts, negotiations, and provisional stabilizations that the integrated analysis allows us to reconstruct in all their complexity.

Fonte: Prepared by the author based on Pretty (1995), Long (2001), Mior (2003), Alves (2008), Callon (1986), Weller et al. (2002), and Mannheim (1952).

CONCLUSIONS

The analysis of sustainable rural development requires a perspective capable of addressing the coexistence of processes that are often treated separately. Larger-scale

economic and institutional forces influence localities but do not automatically determine what actors will do with them. Local capacities are relevant but do not develop outside of broader relationships. Knowledge is mobilized by actors, but it is also contested and transformed in situations where different ways of understanding the world come into contact.

Overcoming the dichotomy between endogenous and exogenous development thus constitutes the starting point of the methodology. The neo-endogenous approach shows that local capacities must be understood in relation to external forces and that development results from the ability to establish connections between these different dimensions (Ward et al., 2005).

Norman Long's actor-oriented approach allows us to move from this structural discussion to concrete relationships. Actors participate in development processes with their own experiences, interests, knowledge, and projects. Arenas and interfaces constitute spaces in which these differences are confronted, negotiated, and transformed. A planned intervention, therefore, cannot be understood as the application of a pre-established model, since its implementation produces new relationships and new meanings (Long, 2001).

A second dimension is introduced by Mannheim. Actors do not interpret their experiences solely through conscious theoretical formulations. Their actions also express knowledge and experiences situated in the a-theoretical realm. The documentary method allows for the reconstruction of this level of experience, going beyond objective and expressive meanings to reach the documentary meaning and practical orientations that constitute worldviews (Weller et al., 2002).

With Actor-Network Theory, a third dimension is added by allowing us to trace the associations that are established between human and non-human actors. The network is not a pre-existing structure; it is constituted through relationships. Translation allows us to track how problems, interests, identities, knowledge, and resources are shifted and reorganized. The actor-world emerges in this process as the one who seeks to become a spokesperson and a conduit for the demands and needs of the other participants (Callon, 1986; Alves, 2008).

The articulation of these three perspectives yields a methodology that can be summarized by three interlinked questions. Where do different social worlds meet and come into conflict? How do actors interpret these situations, and what experiences guide their actions? How are these interpretations shifted and transformed into broader associations? They feed into one another. An interface can alter a worldview; a shift in orientation can change a discourse; a discourse can alter a translation; a new translation can reorganize a network; and the reorganization of the network can produce new interfaces.

Sustainable rural development can thus be understood as a relational and open-ended process. Its trajectory is not fully contained within a project's initial design, nor can it be explained solely by the economic structures that shape the actors. It is produced through the relationships among different scales, actors, forms of knowledge, discourses, institutions, technologies, and resources. The proposed methodology therefore shifts the focus of analysis from the question of which development model should be applied to an investigation of how a given development configuration is

constructed, contested, translated, and reconfigured by the actors involved. The farmer is no longer viewed as a passive recipient of interventions, nor is he conceived as a subject isolated from the structures that shape his actions. He is analyzed as a situated actor, a bearer of experiences and knowledge, capable of interpreting and acting within networks that also transform his possibilities.

This perspective allows us to understand sustainability as a construction that takes shape within the development process itself. The aim is not to seek a definitive definition of sustainable rural development, but rather to empirically reconstruct the relationships through which different actors define problems, recognize knowledge, negotiate solutions, establish alliances, and reorganize their practices.

The methodological strength of this proposal lies in its ability to relate scales, actors, knowledge, and networks without reducing one to the other. Through agency and interfaces, Long sheds light on conflicts and negotiations; Mannheim, by reconstructing documentary meaning, reveals non-theoretical dimensions of practices; Callon and Latour, finally, allow us to trace the associations and translations that constitute heterogeneous networks. Together, these frameworks offer a way to investigate sustainable rural development as a social process in constant construction, in which the conditions of existence are not simply accepted by the actors, but are continuously interpreted, negotiated, and transformed.

NOTES

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