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ARTICLE

Innovations and new promises of change and development in rural territories. The experience of rural areas in Argentina

Inovações e novas promessas de mudança e desenvolvimento em territórios rurais. A experiência das zonas rurais da Argentina

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Abstract: Significant innovation processes are taking place in the rural territories of Argentina, with the potential to transform the prevailing model of agribusiness into a more diverse and resilient rural model. This study examines these innovation processes—grouped into four major categories—along with the limiting factors and their possible implications for rural areas, and the requirements for these innovations to move beyond a niche stage and evolve into a new model of rural development. The methodology is based on multilevel analysis drawing on 105 surveys conducted with technical referents in several rural areas of Argentina, particularly in the Pampas region. A key driver of innovation is the emergence of a new culture and a return to nature. The findings also show that innovations are interconnected, generating new dynamics. To move beyond the niche stage and consolidate new development models, the following would be needed *a priori*: new types of policies focused on rural issues, new forms and practices for promoting rural development, land-use planning strategies, improved infrastructure and rural connectivity, and higher levels of training and knowledge development.

Keywords: innovation, rural, development, socio-technical regime.

Resumo: Processos significativos de inovação estão ocorrendo nos territórios rurais da Argentina, que teriam a capacidade de transformar o modelo predominante de agronegócio em um modelo rural mais diversificado e resiliente. Esta pesquisa analisa esses processos de inovação agrupados em quatro grandes categorias, os fatores limitantes e suas possíveis implicações para as áreas rurais e, finalmente, os requisitos que surgem para que essas inovações saiam de um estágio de nicho e se tornem um novo modelo de desenvolvimento rural. A metodologia de trabalho baseia-se em uma análise multinível, com base na análise de 105 pesquisas realizadas com referências técnicas em várias áreas rurais da Argentina, especialmente na região dos Pampas. Um fator-chave que incentiva a inovação é o surgimento de uma nova cultura e um retorno à natureza. A pesquisa também mostra que as inovações estão interligadas, gerando novas dinâmicas. Para ir além da fase de nicho e consolidar novos modelos de desenvolvimento, seria necessário, a priori: novos tipos de políticas focadas em questões rurais, novas formas e práticas de promoção do desenvolvimento rural, estratégias de planejamento do uso da terra, melhoria da infraestrutura e conectividade rural e níveis mais elevados de treinamento e desenvolvimento de conhecimento.

Palavras chave: inovação, rural, desenvolvimento, regime sociotécnico.

1 Introduction

Argentina's rural territories were organized from the nineteenth century onward under an agro-export logic, which defined a specific way of using natural resources, occupying the land and structuring towns and small cities oriented toward providing goods and services to agricultural production areas (Sili, 2018). The dynamics of these territories historically depended on the productive cycles of meat, wheat, soybeans, cotton, and other commodities linked to international market demand.

Over the course of the twentieth century, the national development matrix began to shift. Import-substitution and industrialization policies boosted urban growth, while rural areas gradually lost population and dynamism, although the agro-export model continued to play a key role in generating the resources needed to sustain the industrialization effort (Guibert & Sili, 2011).

By the late twentieth and early twenty-first centuries, the dynamics of rural territories were undergoing significant change. Technological innovations and new production logics—such as no-till farming, production networks, massive land leasing, contract farming, and increased scales of production, among others—enabled Argentine agriculture to grow substantially, giving rise to a new super-productive model linked to agribusiness and exports of primary goods (Mackay & Perkins, 2019). The downside of this model of productive modernization, despite its high levels of production and productivity, was the intensification of pre-existing problems in rural areas. Land and water resources became increasingly concentrated, hundreds of thousands of producers abandoned their land, rural exodus persisted or worsened, habitats and landscapes deteriorated, and biodiversity declined in many rural areas (Sili et al., 2015; de Groot et al., 2021; Klein & Vidal Luna, 2021; Vera-Candioti et al., 2021).

However, in the past decade, new initiatives and innovations have emerged that could help reverse some of these problems and even revitalize rural areas. New mechanisms and forms of production (agroecology, regenerative agriculture, permaculture, among others) have appeared, along with a wide range of new products, many of them linked to the bioeconomy (Biber-Freudenberger et al., 2020; Dürr & Sili, 2022) . New jobs and services have also developed, both in the agricultural sector and in non-traditional rural sectors (programming, design, teaching, etc.). The migration of population from cities to the countryside is gaining relevance, and teleworking—boosted by the COVID-19 pandemic—has become a source of employment and income (Sili, 2021). Tourism has also emerged as an additional option for generating income and employment, together with a wide range of services and activities aimed at enhancing biocultural heritage (recovery of animal species or local flora, emblematic buildings such as train stations, museums, and schools, which are symbolic places of high value for local identity and for rural areas in general). Processes of rural identity revitalization and improvements in resource management and governance, among others, are also becoming evident.

In the face of this new dynamic, several questions arise: What type of innovations are emerging in rural areas? What factors are driving these innovations? How might they be shaping rural areas?

Through this exploratory study, we aim to address these questions, describing and highlighting these ongoing changes. We also seek to identify the elements that may need to be considered for these innovations to move beyond the niche state, scale up, and be sustained over time, thereby contributing to the construction of a new, more resilient and sustainable model of rural organization and development.

The general hypothesis we put forward is that the innovation processes taking place in rural Argentina are largely driven by shifting perspectives on the environment and sustainability. These innovations are generating positive impacts in rural areas and could contribute to building a new model of rural organization—more dynamic, diversified, resilient and sustainable—capable of retaining and increasing its population and breaking with the historical cycle of depopulation and declining quality of life (Santhanam-Martin et al., 2015). However, for these innovations to scale and become instruments of lasting change, new rural development policies and practices will be needed.

To address these questions and develop this working hypothesis, a qualitative analysis methodology is proposed, based on extensive surveys conducted with numerous technicians, producers and government personnel across most of Argentina.

The first section outlines the conceptual framework on innovation, with a special focus on rural areas. This is followed by a description of the methodological approach, the presentation of the analysis results and a discussion of the main findings.

2 Theoretical Foundation

According to Chen et al. (2022, p. 138),

> innovation can best be understood and summarised as follows: (1) its outcomes represent novel solutions; (2) it aspires to meet social needs; (3) it mobilises beneficiaries to practice collective action; and (4) it results in new forms of civic engagement and new social relations that enhance society's capacity to act.

Thus, innovation can be conceived as the process of creating a new product, service, or management model that increases efficiency or opens new paths or alternative solutions to existing problems. It is not limited to the incorporation of new technologies; rather, it involves social processes that enable the creation of new elements and processes capable of providing solutions to society. In short, innovation is never the result of a single technology or isolated input, but a complex process involving science, technology, policy, and the construction of systems and networks (O'Shaughnessy et al., 2023; Yin et al., 2022).

From this perspective, innovation is not an individual process but a social one, involving multiple actors and their formal and informal relationships (Camagni & Capello, 2013). The role each actor plays depends on social, institutional, and even personal variables (Belliggiano et al., 2020). This is why innovation is embedded in forms of governance involving public, private and civil society actors with diverse capacities and interests. Within this exchange of knowledge and ideas, public action plays a decisive role, particularly through its function as facilitator and driver of knowledge transfer and its ability to promote new forms of cooperation and technical assistance.

Considering that innovation is a social process, it must also be acknowledged that it depends on the geographical, social and cultural specificities of the places where it occurs, as territorial characteristics generate conditions and strongly influence the direction of initiatives. In this sense, innovation can be understood as a social construct conditioned by its geographical context (Madureira & Torre, 2019).

From a broad perspective applied to rural territories, innovation is no longer confined to individual actions or strictly technological and economic processes in agriculture. Instead, it extends across multiple spheres of community life, materializing in a variety of projects related to environmental protection, landscape preservation, heritage recovery and valorization, reconstruction of the social fabric, socio-territorial revitalization in depressed areas, among others (Pyburn & Woodhill, 2014). Esparcia (2014) identifies several types of innovations in rural territories: new products (agritourism and other rural activities linked with environmental protection); technological innovations (irrigation technologies, pollution control, waste treatment, processing of agricultural products); innovative processes (projects based on stakeholder cooperation); organizational innovations (new structures for collaboration among local actors); and attitudinal innovations (promotion of cooperation, development of more resilient models to address emerging challenges, etc.). Beyond the specific forms these innovations may take, what is essential to highlight is that potentially disruptive innovation processes capable of creating new worlds are gaining ground in rural areas (Wang et al., 2023). These processes have the capacity to reshape agendas, institutions and agency, and therefore influence socio-political roles and routines, beliefs, knowledge, power dynamics, and resource allocation (Fátima Ferreiro et al., 2023).

International literature also uses the concept of novelty as a synonym for innovation. A novelty is understood as the introduction of new ideas or artifacts that enable a system to function more effectively (van der Ploeg et al., 2004). This concept of novelty, which is widely discussed, also refers to a highly localized process, dependent on local culture (Gazolla & Schneider, 2015; Mello & Schneider, 2013), with the potential to contribute to system improvement. Novelty cannot simply be transferred from one context to another, as it is strongly shaped by the local conditions of its emergence. This represents the main difference with innovation, which reflects codified and validated knowledge that can circulate globally, be replicated, and exist simultaneously in multiple locations, without being entirely determined by local conditions (Oostindie & van Broekhuizen, 2008).

To interpret these innovation dynamics and their contribution to changes in the organization and development model of rural territories, this paper adopts Geels' multi-level perspective, which proposes that innovation and change processes should be analysed in three levels (Geels, 2002):

1. The emergence of innovations or novel activities and processes that may initially be considered niche, but represent the seeds of new development models.
2. The functioning of a socio-technical regime. The concept of a socio-technical regime provides the framework for understanding the current system or model of organization and production in the rural world. It encompasses the various elements that constitute a mode of production, including existing technologies, production and organizational practices, regulations and norms, forms of governance, infrastructures, resource management conditions (land, property, spatial organization) and socio-cultural discourses that sustain the production regime. A socio-technical regime tends to be stable but evolves as new innovations or disruptive processes emerge and systemically transform it (Markard & Truffer, 2008; Truffer, 2015). In this context, innovations should not only be viewed as novel elements capable of generating employment or improving governance and environmental sustainability, but also as having the potential to modify the productive and social organization regime of a territory. This, in turn, can generate profound changes in the dynamics of production as well as in the broader rural territory. In the case of Argentina, for example, the emergence of new genetic varieties, practices such as no-till farming, or innovative forms of agricultural financing began as niche innovations that rapidly scaled up transforming the socio-technical regime of agriculture and reshaping rural territories.
3. The general contextual conditions in which these actions take place. These refer to the territorial, political, economic and cultural context of a province or country. Such conditions both exert pressure on the existing regime prompting its transformation (e.g., cultural shifts regarding the environment, new demands for food products, among others), and are themselves influenced by the regime, so that territories transform in response to changes in the socio-technical regime or the macroeconomic conditions of a country (Fuenfschilling & Binz, 2018). Again, in the case of rural areas in Argentina, international market conditions, evolving consumption habits, and new environmental demands are key elements shaping innovation processes and, consequently, the socio-technical regimes.

In short, innovative processes or niches can be identified as specific phenomena—novelties or special cases that stand out from other activities in the area, depending on the conditions of the socio-economic, political and institutional context. These innovations may be integrated into the dominant production systems of a territory (the current socio-technical regime) according to the ideologies, expectations, and development visions of local actors. This dynamic, in turn, transforms the existing regime, reconfiguring the socio-territorial context, i.e., the organization and dynamics of societies and rural territories.

The general model proposed by Geels is extremely useful for analyzing the different types of innovations occurring in rural areas, their origins, the factors driving them and their capacity to transform prevailing socio-technical regimes. Figure 1 illustrates this multilevel analysis framework applied to the Argentine case, showing the various organizational models of the rural world. Our study focuses specifically on the analysis of innovation processes at the final stage.

This conceptual framework enables a general analysis of innovation processes, although it does not delve into the conflicts and disputes surrounding Argentina's rural development model, nor does it examine innovation from a microsocial perspective. Addressing these aspects would require a much more specific framework, incorporating the concept of actor networks and conflict analysis, as well as detailed microsocial data, which is not available for this study.

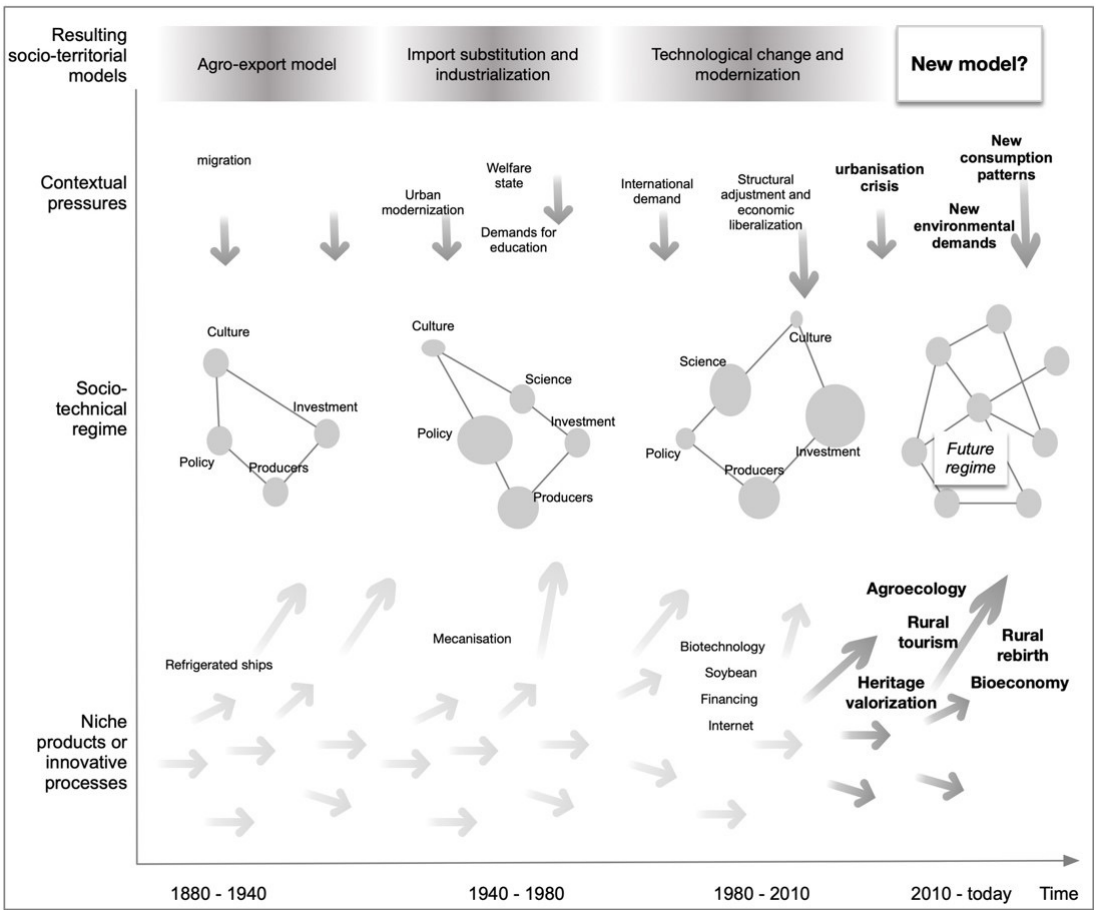

Figure 1: The multilevel

3 Methodology

This research was based on the analysis of 105 innovative processes currently emerging in rural areas of Argentina, grouped into the following categories:

- productive innovations, including the development of new products or the adoption of new production methods;
- innovations for the valorization of biocultural heritage;

- migratory processes and new ways of living;
- new forms of governance and management in rural territories.

Each innovation is examined through the following variables:

- type of innovation or experiences;
- motivations or enabling factors;
- contribution of the initiative to territorial development;
- requirements for sustaining the innovation over time.

A qualitative approach is used, supported by structured surveys administered to technical referents in the areas where these innovations take place. This methodology values the local expert knowledge of extensionists, development agents, municipal officials, and researchers. The study involved the following activities:

Identification and survey of innovative experiences. Several strategies were used to map innovative experiences across rural Argentina. First, a survey was conducted among agricultural and agro-industrial companies in different regions of the country. Second, two workshops were held in the Pampas region on rural development processes and methodologies, which helped identify innovative experiences nationwide, particularly in the Pampas. Finally, following a snowball approach, more than 40 technicians, promoters, extensionists and municipal officials involved in local development projects across much of the country were identified. These strategies resulted in a list of 213 innovative processes in rural areas and a corresponding list of local technical referents linked to these experiences (local development agents, extensionists, etc.).

Survey design. A survey form was designed to collect detailed information on these innovation processes. It aimed to capture the main features of each initiative, the factors that enabled their emergence, their territorial impacts, and the limitations or challenges that must be addressed to sustain these innovations over time. This form was tested with five initial surveys, which helped refine its focus and improve the potential response rate. The final version included the following questions:

1. Could you mention two productive initiatives (or innovations) that are genuinely new in your area of work?
2. Could you describe or explain what this initiative or innovation consists of?
3. What do you consider to be the factors that enabled or facilitated the implementation of this initiative or innovation?
4. What factors do you think limited or hindered its implementation (e.g. bureaucracy, lack of markets, macroeconomic policy, lack of infrastructure, lack of local political support, poor road conditions, distance, lack of financing, etc.)?
5. How did these initiatives or innovations impact the territory (employment generation, environmental improvements, etc.)?
6. What policies or actions do you think are needed to consolidate these initiatives and allow them to scale up or multiply?

Sample selection. The cases to be surveyed were selected from a list of 213 initiatives. The criterion was the availability of local technicians with knowledge of them and willing to complete the survey. This process, carried out via email and telephone, led to the selection of 105 local technicians from different parts of Argentina, including extension agents, municipal officials or other local actors.

Conducting the survey. The 105 surveys were conducted virtually using Survey Monkey software, although in many cases follow-up phone calls were made to clarify questions or improve the quality of the responses. The surveys were completed during the period October

- November 2024, and were distributed as follows: Pampa (69), Northeast (6), Patagonia (17), Cuyo (5), and Northwest (3).

Data consolidation. Once all the surveys were downloaded into an Excel database, the quality and consistency of the information was reviewed. The data was then categorized according to the themes defined for this research. The final distribution of surveys by theme was as follows:

- Productive development: n=36 / 34%
- Biocultural heritage valorization: n=22 / 21%
- New forms of governance and management: n=14 / 13%
- Migration and new ways of living: n=33 / 31%

Data analysis. With all the information organized and systematized according to the proposed categories, frequency tables were drawn up to characterize each type of innovation. Once these broad groups for content analysis were defined, the survey data was processed to facilitate categorization and qualitative pre-analysis in Maxqda software. The analytical categories were developed *ad hoc* based on a close reading of the material, grouping excerpts by thematic affinity, recurring references and related concepts. These categories were then compared to verify their consistency. The resulting thematic categories were examined, giving greater relevance to those with the highest number of related comments, and explaining the main narratives identified. Table 1 presents the results of the analysis, showing the different types of innovations/initiatives and the variables analyzed, together with their frequencies and percentages.

Given the lack of territorially disaggregated data, this paper does not analyse structural changes such as reductions in land concentration, rural exodus or inequality.

4 Results and Discussion

This section analyzes each type of innovation identified, considering their main characteristics, the factors that drove them, their territorial impacts, and the requirements needed for these innovations to scale up and move from a niche stage to a new socio-technical regime. Each type of innovation or initiative is illustrated with a specific experience that serves as a case study.

4.1 Innovations for productive development

The productive innovations observed are diverse, but can be grouped into two broad categories. The first includes the adoption of new technologies and production processes (20). Emerging examples range from agroecology, permaculture, and hydroponics to new forms of water use and management, new crop rotation schemes, integrated and circular production practices (such as mini-distilleries), and the conversion of livestock farms to more intensive production are emerging. Agtech and digital agriculture are also gaining prominence.

The second category involves the diversification of activities and products (16 cases). This refers to the creation of products that constitute an "innovation", or a genuine novelty in the area studied—items that may be known elsewhere, but are entirely new in these rural territories. Examples include truffles, dried fruits, special meats, olives, wines, aromatic plants, natural cosmetics, new vegetable varieties, egg and poultry production for local or regional consumption, cheeses, craft breweries, animal serum for vaccine production, organic amendments and microbial broths, and biodegradable pots made from used yerba mate, among many others. New tourism activities have also emerged in various forms, such as estancia tourism, farm visits, vineyard and winery tours, rural lodging, and country restaurants. A concrete example

Table 1: Innovation types and analysis variables

	Productive initiatives	No.	%	Initiatives for biocultural heritage valorization	No.	%	Migration and new ways of living	No.	%	Governance and management initiatives	No.	%
INNOVATIONS	New technologies and production processes	20	55.5	Recovery of historical infrastructure and facilities	10	45.5	Work-related migration and external income	19	57.6	Creation of networks and partnerships	11	78.6
	Diversification of activities and products	16	44.5	Biodiversity conservation	6	27.3	Work-related migration and local income	14	42.4	Inter-institutional links	3	21.4
				Recovery of local knowledge and traditions	6	27.3						
	Total	36	100.0	Total	22	100.0	Total	33	100.0	Total	14	100.0
FACTORS	Territorial conditions and productive structure	29	44.6	Increased interest in heritage	20	42.6	Pursuit of a lifestyle close to nature	29	49.2	Existence of networks and public policies	11	35.5
	Increasing value of environmental sustainability	14	21.5	Presence of collaborative networks	16	34.0	Pursuit of greater security and tranquility	14	23.7	Demands for greater collective action	10	32.3
	Availability of technologies and training	14	21.5	Revaluation of rural life	11	23.4	Pursuit of new job opportunities	10	16.9	Presence of proactive actors	8	25.8
	New market opportunities	8	12.3			0.0	Presence of family networks	6	10.2	Access to information	2	6.5
		65	100.0		47	100.0		59	100.0		31	100.0

Table 1: Continued...

	Productive initiatives	No.	%	Initiatives for biocultural heritage valorization	No.	%	Migration and new ways of living	No.	%	Governance and management initiatives	No.	%
IMPACTS	Employment generation and new opportunities for local development	18	30.0	Tourism development	17	37.0	Employment generation and new opportunities for local development	24	30.0	Employment generation and new opportunities for local development	14	53.8
	Strengthening of the territory's productive capacity	14	23.3	Revaluation of identity and community life	14	30.4	Social and cultural changes	21	26.3	Strengthening of production networks	9	34.6
	Productive diversification	10	16.7	Employment generation and new opportunities for local development	11	23.9	NEGATIVE	19	23.8	NEGATIVE	3	11.5
	Improved environmental sustainability	8	13.3	Improved environmental sustainability	4	8.7	Improved local services	16	20.0			0.0
	Strengthening of local consumption and food security	6	10.0			0.0			0.0			0.0
	NEGATIVE	4	6.7			0.0			0.0			0.0
		60	100.0		46	100.0		80	100.0		26	100.0
REQUIREMENTS	More training and knowledge	28	24.6	More effective public policies	18	38.3	Improved infrastructure and connectivity	24	38.7	More effective public policies	9	36.0
	Promotion of rural development	21	18.4	Greater community participation	16	34.0	Promotion of rural development	18	29.0	Promotion of rural development	6	24.0
	Financing	18	15.8	Financing	8	17.0	Services to improve the quality of life	13	21.0	Macroeconomic stability	3	12.0
	Improved infrastructure and connectivity	18	15.8	Improved infrastructure and connectivity	5	10.6	Land-use planning	7	11.3	Greater community participation	3	12.0
	Land-use planning	15	13.2			0.0			0.0	Financing	2	8.0
	Macroeconomic stability	14	12.3			0.0			0.0	Improved infrastructure and connectivity	2	8.0
		114	100.0		47	100.0		62	100.0		25	100.0

of this type of activity is the aromatic plant business. In fact, in the southern Pampa region and northern Patagonia, several traditional cereal and livestock farmers began producing aromatic plants (lavender, mint, thyme). A few years later, a network of producers was created, which accelerated learning with INTA's technical assistance, exchanges, participation in fairs and sales contracts with wholesale companies. These initiatives were linked to rural tourism activities, helping to disseminate the experience and add value to production through direct sales. This activity evolved over time: some producers abandoned it due to reduced support from technical agencies, while others expanded by incorporating new activities such as drying processes, essential oil extraction, new products and markets.

All these product and process innovations have been driven by several factors, including territorial conditions such as proximity to cities, high-value landscapes, environmental conditions, low land costs, and access to irrigation water, as well as the presence of a dynamic productive fabric with strong entrepreneurial initiative. Another important factor is the value that producers place on environmental sustainability. The availability of technologies and the capabilities needed to carry out these activities is also relevant. Finally, new market opportunities are opening up for generic products, but especially for those with high environmental value, given the growing demand for this type of output.

New innovation processes or initiatives help generate jobs and create new opportunities for local development, contributing to the diversification of the local productive fabric and fostering a more favorable business climate for the emergence of new activities. These initiatives also strengthen ecological awareness and improve environmental sustainability, as they are often closely linked to new approaches to natural resource use (bioeconomy, organic production, agroecology, etc.), and to new consumption patterns, given their strong orientation toward local markets and short production-consumption circuits.

However, despite its richness and relevance for rural development, sustaining these processes over time requires meeting certain needs. First, there is a need to strengthen scientific and technological knowledge and technical training to enable a more intensive use of biologically-based products (biofuels, energy from forest biomass, new nutraceutical foods, by-products for the pharmaceutical industry, bioplastics, etc.) (Marsden & Farioli, 2015). It is also necessary to develop more effective strategies and productive promotion policies to consolidate and scale up new activities. In addition, there is a demand for financing and improvements in infrastructure and connectivity (particularly rural roads). The need for land use planning and land policies also appears as an important demand, as the lack of adequate planning and regulation discourages new investments. Along the same lines, simplifying bureaucratic and administrative procedures and fostering a more business-friendly environment are also essential.

4.2 Innovations for the valorization of biocultural heritage

An important phenomenon in rural areas is the emergence of projects aimed at rescuing biocultural heritage and revaluing local identity (Sili & Martin, 2022) . Three main types of innovative processes can be identified:

1. Recovery of infrastructure, such as old train stations or the restoration of emblematic historical buildings in small rural towns—schools, mansions, mills, theaters, and others—usually led by local organizations, often with support from municipal governments.
2. Revitalization of local knowledge and traditions, including the recovery and celebration of immigrant culture (music, festivities, gastronomy, languages, etc.), the consolidation of tourist routes with new product and services, and the promotion of rural community tourism.

3. Biodiversity conservation, which encompasses the recovery of native species, the establishment of private nature reserves to protect resources and enhance sustainability, and the preservation of wetlands by local groups committed to safeguarding both biological heritage and recreational areas.

Most of these initiatives are driven by local organizations with support from municipal governments. The key factors enabling these innovative processes include a growing local awareness of the value of biocultural heritage as a source of local development opportunities; the existence of collaborative networks that bring together community organizations, government agencies and technical agencies such as INTA; and, finally, the renewed appreciation of rural life, particularly in the post-pandemic context. A concrete example of the valorization of biocultural heritage is the restoration of an old railway station in Nicolás Levalle. This initiative focused on restoring an old railway station, its halls and adjoining buildings in the southern Pampas region. It was led by a civil association made up of former residents who began the work in 2014. The station's spaces were repurposed to create a tea room, a railway history museum, a museum of work, a bird interpretation room, and former railway workers' homes. The restoration of the material heritage was complemented by cultural and tourist activities (theater, music and dance events, folk groups) and visits to old agricultural establishments. Efforts to recover local history, buildings and associated assets were also paired with actions aimed at preserving natural heritage, including salt flats and native flora and fauna. Overall, this process has improved the quality of life of the local residents, as the restored spaces enabled the development of new income-generating services and helped create a well-maintained landscape—with refurbished buildings and an appealing natural environment—that attracts both weekend visitors and the local population.

These initiatives have had an important impact on rural territories, fostering tourism, strengthening local identity and community life, and generating new jobs and local development opportunities.

However, as respondents noted, sustaining these innovations over time requires more effective and continuous public policies, with greater community participation in the projects, stable financing, and improved infrastructure and connectivity to ensure better access to these heritage resources.

4.3 Migration initiatives to rural areas and new ways of life

A third type of initiative occurring in rural spaces involves migratory movements from cities to the countryside—a trend that accelerated after the COVID-19 pandemic (Sili, 2019) .

Broadly speaking, two major types of migration processes and settlement in rural areas can be identified. The first includes people who relocate while maintaining local employment and income through new production or service activities; they depend on the local productive matrix and view rural areas as a place to live and work. The second refers to people who migrate to rural areas but rely on external sources of employment and income. They live in rural areas but work elsewhere either remotely or on-site, and therefore do not depend on the local productive matrix. For these migrants, rural areas are primarily a place to live, not to generate income.

Three groups of migrants can generally be identified: (a) young adults who, after studying or working in cities, migrate to rural areas and start various activities; (b) retirees who, after years of work and some savings, decide to settle in a rural area in search of a quieter and a healthier environment; and (c) adults aged 30 to 50, often with already consolidated families,

who relocate to small towns or rural areas seeking a different lifestyle, particularly greater safety (Ferrás, 1997).

The main factors driving these migratory processes include the search for lifestyles closer to nature, greater safety and tranquility, job opportunities, and finally the presence of family networks that ease adaptation to the new rural context and provide support in times of uncertainty.

These migratory processes have produced significant impacts on the rural territories themselves. The arrival of new residents expands the local consumer market, creates new employment opportunities, and strengthens local development. Schools remain open thanks to increased enrollment, businesses maintain their sales levels, and local associations sustain their activities with newcomers' participation. Social and cultural effects are also notable, as migrants introduce diverse perspectives on local issues, foster participation, and generate new ideas and proposals for the community. However, tensions and conflicts arise, as newcomers often hold different views and habits from long-term residents. Additional challenges include growing competition for housing or land, as well as disputes over land use and environmental management, given newcomers' contrasting conceptions of nature.

For these migration and settlement processes in rural areas to be sustained over time, several key issues must be addressed. First, rural infrastructure—especially physical and digital connectivity—need improvement. Many areas lack adequate health and education services, forcing residents to travel, and reliable internet access is essential for productive development, business management, and teleworking. Second, local governments need development policies that can harness and better articulate the new dynamics emerging in these territories. Third, there is a demand for services that improve the quality of life, especially in health and education. Finally, better land-use planning and management policies are required to ensure appropriate environmental management and sufficient housing availability.

4.4 Innovation in rural development governance and management

The last set of innovations observed in rural areas involves governance and management initiatives for rural development. Two major types can be distinguished.

First, there is the creation of networks and associative initiatives that enable different actors to generate joint projects—for example, producer networks that market goods jointly at local fairs, collaborate on training, or develop more sustainable productive activities, among others. Second, new initiatives are emerging that connect communities, governments and universities in support of local development. These partnerships allow for projects with greater institutional backing, as they involve public agencies and make it possible to address more comprehensive territorial development goals or maintain rural infrastructure. Examples include the creation and management of rural road consortiums; support for rural schools; improvement in health services; the recovery of local heritage; the constitution of local networks to promote rural life or revitalize rural villages; the maintenance of agricultural and village landscapes; the valorization of public spaces; and new waste management practices (Carrión et al., 2020). These initiatives generate new forms of local governance by articulating public, private and collective action to address issues that governments—particularly municipal authorities—cannot solve on their own (Carrizo & Sili, 2018).

Several factors have encouraged the implementation of these innovative processes. One is the presence of institutional networks and supportive public policies, as many initiatives are generated under the protection and support of existing networks or policies. Another key factor is the growing demand for collective action to address local challenges, as communities

recognize the need to work together on issues beyond the capacity of public agencies. A third factor is the presence of proactive local groups or actors capable of generating innovative actions. A concrete example of this new type of actor and form of governance is the **CRECER Association**. In fact, in the center of the Pampas region, a group of technical, social and productive associations created the CRECER Rural Communities Association, whose objective is to promote rural development by coordinating resources from government institutions, technical agencies and producer organizations. The association works with rural families, promoting training, improving infrastructure, rescuing heritage and identity, and fostering non-traditional productive activities. The CRECER association has had a significant impact on rural areas, as its initiatives have addressed quality-of-life issues that local governments were unable to resolve. This model of rural development promotion, which brings together the public sector, civil society organizations and businesses, has been replicated in other rural areas, consolidating a network of associations with strong legitimacy to address rural development issues.

These innovations have significant local impacts, as they create jobs and new opportunities for local development while strengthening production and marketing networks.

To sustain this type of innovation, several conditions are required. First, more effective public policies and better development-oriented promotion and information practices are needed. There is also a need to reduce bureaucratic and regulatory burdens so that public policies can align more efficiently with public action. Finally, respondents highlight the need for greater community participation in local development processes.

All this analysis highlights the following key elements:

Innovations in rural areas go beyond technology. It is evident that technological and digital change (mobile phones, the internet, artificial intelligence, and new agricultural production technologies) is transforming production and communication systems—enabling new modes of production, improving connectivity and mobility, and reshaping rural life. However, current innovations in rural Argentina extend far beyond technological and agricultural shifts (Bina et al., 2020). Much of the ongoing change is social, cultural and economic, affecting multiple dimensions of rural life (Chen et al., 2022; Havas et al., 2023). This has also been validated in Latin America, especially through rural development initiatives promoted by RIMISP, IICA and other organizations, and similarly demonstrated by the European Union's LEADER programmes (Navarro-Valverde et al., 2022).

The rise of a new culture and a return to nature. A major driver of innovation and rural change is the new way of understanding nature and rural territories, reflected in new discourses and behaviors around environmental sustainability, the value of heritage, changes in consumption patterns, and the search for safety and a better quality of life. These factors are fueling innovation and transforming production models, rural management and everyday life in rural areas (Vindevoghel, 2024). At the same time, new imaginaries of rural life and new environmental narratives are based on the idea that rural development no longer depends exclusively on agriculture, and that the strengthening of a dynamic agro-export production system focused on international markets cannot, by itself, promote rural development (Graziano da Silva et al., 2009). Instead, rural development is understood as a systemic and multidimensional process that requires comprehensive rural policies rather than policies and incentives aimed solely at agriculture.

Territory matters. Innovation processes have historically been guided by sector-based approaches focused on production and productive development. However, emerging innovations highlight the importance and structuring role of territory as a key element in development (Schneider & Tartaruga, 2004). These innovations depend on the geographic, social and cultural

specificities of the places where they arise, since local characteristics and the specific demands generated by local problems largely guide the direction of innovation processes.

Innovations bring about social and territorial change. Innovation processes do not operate in isolation; rather, they reinforce one another and build a virtuous development dynamic (Neumeier, 2017). For instance, innovations for the valorization of heritage can stimulate new rural tourism activities, which in turn foster service development, improve quality of life, and attract new migrants (Ravazzoli et al., 2021). The implementation of new productive initiatives creates jobs and the energizes local markets. The arrival of new inhabitants and renewed productive dynamism, in turn, encourage new forms of resource and territorial management (Bianchi et al., 2021), while also generating favorable conditions for further productive initiatives (Koopmans et al., 2018). The integration of these innovation processes creates a virtuous circle capable of building new types of territories. From this broader perspective, innovation is no longer limited to individual actions or strictly technological and economic processes; it cuts across multiple dimensions of rural life, including heritage and cultural valorization, landscape and environmental care, and cultural animation, among others (Mello & Schneider, 2013; Ribeiro et al., 2024).

Moving from niche actions to new socio-technical regimes requires new conditions. The innovation processes analyzed here are specific and have significant impacts on fields and villages, but they still lack the scale and capacity to transform the existing socio-technical regime. Currently, two models coexist: the long-standing modernization model and an emerging one that seeks to consolidate itself but has not yet reached sufficient scale. Advancing towards a more diverse and sustainable socio-technical regime requires creating conditions that both support ongoing innovative processes and enable them to scale, multiply and reach a critical mass (World Bank, 2003). The demands expressed by the surveyed actors, together with international experience, highlight the need to make progress in five main areas:

1. *New types of rural-focused policies*. More comprehensive public policies are required—ones that move beyond sectoral approaches centred solely on agriculture and address the broader complexity of rural territories (Yin et al., 2022).
2. *New forms and practices for promoting rural development.* Sustaining and scaling up innovation processes requires technical support with broader approaches capable of accompanying diverse forms of innovation, not only productive ones (Liu et al., 2020). Municipalities appear as key actors given their proximity to rural issues.
3. *Land-use planning strategies*. Effective land management plans are essential to better organize territories, prevent conflicts between activities, and protect environmental conditions, ensuring sustainability, resilience and environmental value (Sili, 2022).
4. *Improved infrastructure and rural connectivity*. This includes improved roads and access to better health and education services (Cowie et al., 2020).
5. *Higher levels of training and knowledge development.* Sustaining innovation processes requires enhanced knowledge and skills, not only in technological domains, but also in various organizational aspects such as communication skills, negotiation, design and best practices in organizational and project management. Support from academic and scientific-technological institutions is essential.

5 Conclusions

After decades of progress in the modernization and development of agribusiness as Argentina's dominant productive model, significant changes are now emerging in rural areas,

giving rise to new development dynamics (Silva Machado, 2017). These changes are mainly driven by renewed perspectives on nature and increasing demands for a higher quality of life. Productive innovations, resource valorization, migration to the countryside, and new forms of rural development governance are the main drivers of this transformation, as reflected in studies conducted in the European context (Silva Bezerra et al., 2021; Rogelja et al., 2023), and widely analyzed and documented in Latin America, particularly by Schneider and other authors (Gazolla & Schneider, 2015; Mello & Schneider, 2013)

Within these innovation processes, productive innovations play a central role in generating new employment dynamics and reshaping the production matrix, allowing rural areas to move beyond an exclusively agricultural model toward a more diversified and resilient rural economy (Schneider, 2000; Sili & Pazzi, 2020). Innovations in heritage valorization, meanwhile, have contributed to redefine the meaning of rural life, identity and heritage in a broad sense—both natural and cultural. Rural areas are increasingly viewed as places for constructing life itineraries, not merely spaces for production.

Similarly, new migratory dynamics confirm that rural areas are acquiring new meanings and are now perceived as territories where it is possible to build a future. Innovations in governance models are clear indicators of the shift in how rural development is conceived: from a state-driven model to one that is open to collective and private action. Social organizations and private actors are becoming co-responsible for shaping the rural future.

All these innovations point to an intentional shift taking place in rural areas; however, most remain niche initiatives, isolated cases, or specific experiences. For these transformations to consolidate new socio-technical regimes, they need to scale up and form new systems of action.

This requires new policies and practices. Indeed, there is a widespread demand for public policies that differ markedly from traditional sectoral approaches, which have typically focused on agricultural development. Current demands center instead on territorially-oriented policies with a more comprehensive and systemic approach. There is also a strong demand for new mechanisms to promote rural development, with greater capacity to manage multi-stakeholder networks. Infrastructure emerges as a critical factor, as the lack of adequate roads, digital connectivity and equipment to improve quality of life (education and health) constrains the generation of new initiatives and projects in rural contexts.

All these elements are consistent with the proposals put forward by Mulgan (2020) and Ferguson (1990), who argue that innovation processes are essential for addressing new global challenges as well as those posed by exclusionary models of modernization. In this sense, we broadly concur with Mulgan that social innovations offer viable solutions to rural problems; that innovations must go beyond technology; that imagination should play a more central role: that rural issues require comprehensive and global approaches, and, importantly, that we must move away from traditional views that regard agricultural production growth as the sole path to rural development.

This study sought to identify and broadly characterize these innovation processes. The multilevel analytical framework pioneered by Geels proved useful for understanding innovation from a macrosocial perspective. However, its universal and limited contextual grounding constrain its ability to explain the conditions needed for niche innovations to consolidate. Addressing this limitation will require further local-scale research to observe these innovation processes closely and analyze the conditions necessary for their consolidation, the emergence of a new socio-technical regime, and ultimately a new model of rural development. Actor-network theory, with its microsocial perspective and its emphasis on the co-presence and co-existence

of development models, may offer valuable insights for this line of research (Albaladejo, 2020; Gasselin et al., 2021) .

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