

# WALKING ON NEW PATHS.

SOLUTIONS FOR FAMILY FARMING

FACING CLIMATE CHANGE



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San José, Costa Rica  
2023

# WALKING ON NEW PATHS.

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**SOLUTIONS FOR FAMILY FARMING**

**FACING CLIMATE CHANGE**





## PRESENTATION

The experience of conducting the INNOVA AF Program made it evident that it was possible to trigger broader rural transformation processes by implementing practices and knowledge for climate change adaptation. These changes, presented and analyzed in this book, provide inputs to position family farming as a cornerstone for adapting territories to climate change.

The leading role played by family farming in Latin America in food production, resource management, and conservation is an irrefutable fact that is widely recognized. However, this leading role needs to be appropriately identified, especially regarding climate change adaptation processes in the region's countries and meeting the goals determined by each country in their climate agenda. As stated earlier, family farming accounts for a good share of food production and controls very sensitive natural resources; however, it has not been identified or characterized as a central figure for adaptation processes overall. Both the national and global climate agendas ignore the potential of family farming. In fact, they do not recognize the benefits it generates and therefore do not contribute to co-funding to sustain practices clearly identified as mitigating climate change.

This book explores that potential, but it does so from the point of view of family farming as a transforming axis in the territory due to implementing practices and knowledge that help their production systems adapt to climate variations. This resilience capacity was evident during the pandemic because, against all odds, farmers kept producing food while sacrificing their livelihoods.

For this reason, making visible the experiences, lessons, and challenges around adaptation to climate change is critical, with the aim that future public or private actions on the subject are more effective and define agendas that contain elements that are not only technological but also economic, institutional, and governmental. This will promote larger-scale interventions that can sustainably transform the landscape.

This book does not intend to introduce new concepts on rurality, family farming, and climate change but instead proposes recommendations and inputs to broaden the rural approach. The aim is to create awareness that an effective climate change adaptation would not be possible without family farming.

We hope that reading this book will provide a new perspective for a more accurate planning and construction of strategies, program proposals, and projects that position family farming the way it deserves in climate change adaptation of rural territories.



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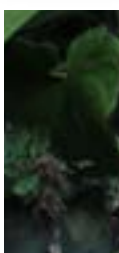
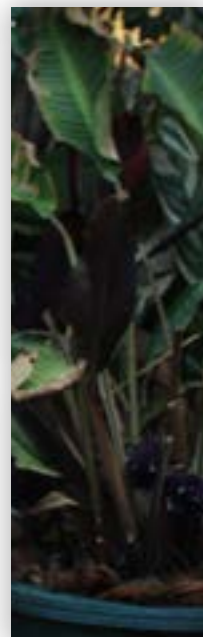
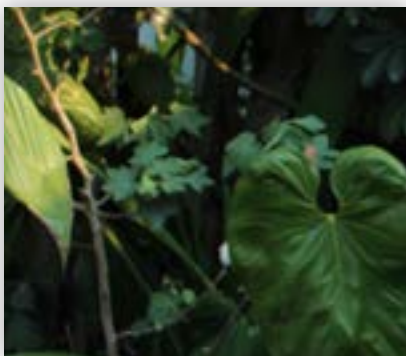


## FOREWORD

The INNOVA AF program -launched by IFAD and IICA- aims to generate and transfer innovations and knowledge to help family farming to adapt to the new conditions of climate change while sustaining and enriching its production systems and improving their quality of life. The strategy proposed by the program has been based on the combination of two elements:

- Firstly, implementing innovative climate change adaptation practices. These experiences were carried out through 11 structured projects in 8 Latin American countries, receiving funds and support from IFAD and IICA. These practices were wide-ranging and responded to climate change adaptation issues in each territory.
- Secondly, the construction of an environment for generation, systematization, diffusion, and reuse of knowledge arising from the same innovative practices in similar projects from different contexts and building territorial public-private alliances.

Innovative practices and knowledge have fed into each other, creating a virtuous circuit of innovation, learning, new climate change adaptation practices, and so on. In this way, INNOVA AF constitutes a privileged knowledge construction program, which is validated and strengthened using new techniques. This continuous-learning dynamic is the basis for a transition into resilient and sustainable rural development models, thus surpassing the family farming organization model of recent decades. This work is organized into different chapters, which can be read independently according to the preferences and interests of each reader.





- The first chapter focuses on innovations and knowledge's role in building a transition towards new, much more resilient models of rural development. We intend to observe, in a general and conceptual way, how innovations and knowledge can contribute to changing the current socio-technical regimes and to building new productive organization modalities that ultimately open the doors to a much more resilient rural development model, where family farming can combine climate change adaptation with the improvement of its production conditions and the quality of life of its people, scenario, or development model that is implicit in the INNOVA AF proposal.
- The second chapter presents the INNOVA AF program. We did not think of it only as a program that generates projects to benefit family farming but as an actual instrument for change since it shows clues of the path and method to follow for the construction of a new rural development model that is more resilient and sustainable.
- The third chapter focuses on analyzing the innovation processes and all the efforts that the multiple stakeholders have made so that all these innovation processes can scale up and become stable dynamics within the territory. This would consolidate a new, much more resilient, sustainable rural development model, as implicitly proposed by INNOVA AF.
- Ya en un cuarto capítulo nos centramos en analizar las grandes lecciones aprendidas de estos procesos de innovación y cambio, los grandes desafíos y las estrategias posibles a seguir para consolidar un nuevo escenario o modelo de desarrollo rural.

Each of these chapters is accompanied by references and QR codes that link to other resources such as videos, documents, maps, and charts, which explain or illustrate in much more detail many of the cases mentioned in these pages.

This way, readers can easily access direct sources if they are interested in a particular experience or case.







## **INTRODUCTION**

**Family Farming in the Face of Climate Change  
and the Need to Build Novel Rural  
Development Practices**



Rural territories in Latin America are currently facing a profound new structural challenge related to balancing and harmonizing productive development, with the improvement of both environmental conditions and the quality of life of their population, within the new global context of climate change.

This challenge represents an actual breakthrough in the region since development policies and practices have historically focused on improving production and quality of life, where increased productivity, land problems, infrastructure, marketing, and quality of life overall were the critical issues on the policy agenda. Climate change is now generating new problems and therefore imposes a new plan beyond past decades' development agendas.

Climate change refers to the steep variations in temperatures and weather patterns in the medium and long terms. Some of the causes of such changes may be linked to natural phenomena that man cannot change, for example, variations in the solar cycle or increased gas emissions from volcanoes. However, the primary climate change triggers have been human actions for more than a century, mainly due to carbon emissions from the burning of fossil fuels such as coal, oil, and gas, as well as agricultural practices and forestry activities that release carbon, which is why adaptation measures on the farms are essential.

The consequences of climate change have been thoroughly analyzed, being mainly the increase in the temperature of the planet overall, the melting of glaciers, an increase in the average sea level, changes in precipitation patterns, and intensification of extreme climatic events -such as more intense temperature peaks, frosts, periods of drought, or, on the contrary, rainfall and floods, and frequency of strong winds, among many others.

Climate change effects around the rural territories of Latin America, especially around the organization and dynamics of family farming, are very evident. Crops are either lost or their quality decreases; health problems increase, infrastructure and natural capital are degraded, among many other issues. All these problems are becoming increasingly evident, thus making us think of future scenarios that are not very optimistic in terms of environmental conditions.

### Family Farming and Climate Change

In LAC, around 16.5 million farms belong to family farmers, who bring together a population of around 60 million people. They represent about 81.3% of the total farms in the region, accounting for 23% of the agricultural area of LAC.

Family farming (FF) contributes to climate change adaptation through its knowledge to manage its risks, conserving in-situ agrobiodiversity, as well as low-input consumption techniques that contribute to mitigation of greenhouse gases.

FF implements a series of innovative climate adaptation strategies, such as the adoption of sustainable, modern, and traditional practices that contribute to increasing resilience and adaptive capacity in the face of climate change.

CEPAL, 2014.



These problems affect all rural areas and all agricultural producers in general. But the answers to these problems are different in all productive segments. To deal with these critical conditions and the possibility of seeing their production levels reduced, medium-sized and large farms in the region have proposed three a-priori strategies:

- a) In some cases, they have expanded territorially, occupying new lands outside their borders (through purchases or occupations) without changing the production models to maintain their production levels by increasing their extension,
- b) In other cases, many farms have changed and intensified the use of resources (especially land) within the same farms (deforestation to cultivate or produce livestock), which has generated more environmental problems and loss of sustainability in their farms, and
- c) In many other cases, producers have adopted actions to adapt and improve resource management using new agricultural and livestock practices that are more respectful of the environment. This would be a strategy to increase resilience.





The situation with FF is very different, given that not only do they not have opportunities for territorial expansion and land use change, but their available resources are very scarce. For this reason, their only choice is to substantially improve their adaptive capacity and resilience to the new conditions of climate change and variability. To do this, greater knowledge and new, more innovative practices are required in production and resource management.

### **Vulnerability of Family Farming to Climate Change.**

We need to improve our understanding of the vulnerability of family farming, which is why additional research is suggested in three large areas that should be developed through programs and adaptation plans to be implemented with the following information:

1. Consistent and comparable data on who they are and where the most vulnerable systems are located;
2. Adaptation measures that can reduce vulnerability, and
3. Costs, benefits, and effectiveness of the measures used or recommended to reduce their vulnerability.

Camila et al. 2019.

Many of these initiatives introduce new knowledge about products and technologies, farm production and commercial process planning and management, as well as territory organization networking with other stakeholders and organizations, among many others. In the end, this turns into social capital and knowledge, with skills and lessons that can be decisive in adapting to the new context conditions.

Numerous local, national, and international organizations in Latin America have been promoting improved processes of innovation, technological change, and management to increase the adaptation capacity of FF to climate change. These processes include developing new climate-change-adapted infrastructure, farm equipment, production technologies, contemporary products with improved and adapted varieties, data collection and analysis systems, replanting, and water capture and management systems, among many others.

### **The Paris agreement and agriculture: a look at the implementation of Nationally Determined Contributions (NDC) in Latin America.**

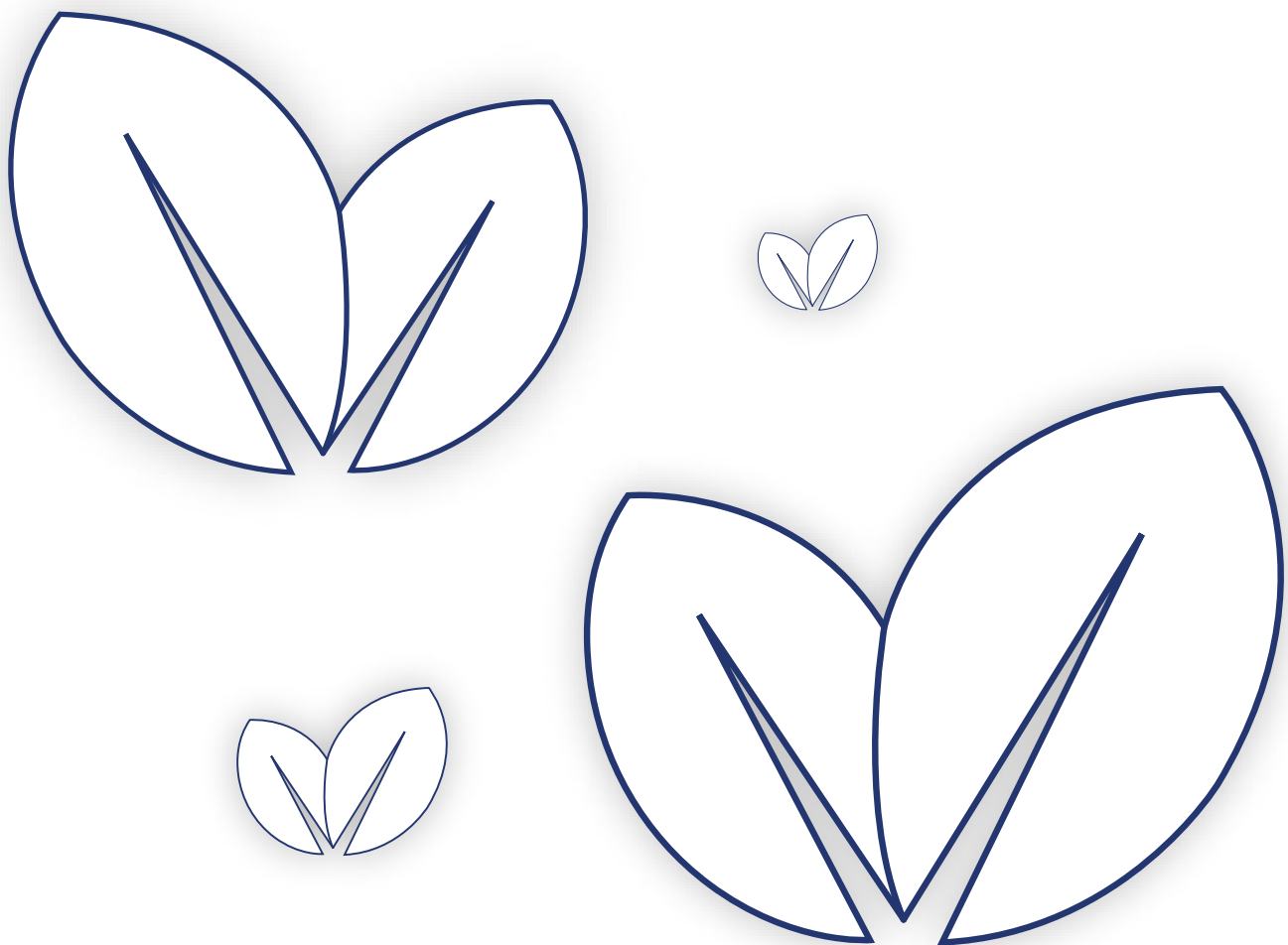
Family farming is not clearly identified as a key player in mitigation and adaptation of the agricultural and forestry sector. Carbon dioxide can be absorbed in soils and biomass by applying good practices. However, appropriate methods for identification and prioritization of measures should be determined and applied by integrating cost-benefit evaluation methods of mitigation and adaptation measures and by facilitating access to agroclimatic information and other types of tools applied to the work of family farmers.

González, et al. 2022.



Beyond the initiatives or practices put in place to adapt to climate change, in any case, knowledge and innovation appear as decisive factors. Both are implicit and cut across all practices that promote climate change adaptation. Building knowledge and innovation is ultimately the only practical way for FF to adapt to new conditions, knowledge, and innovations resulting from an interactive collective learning process anchored in the territory and incorporated into the social plot.

This paper presents the results of this virtuous dynamic, emphasizing how this dynamic allows or enables the construction of new possible futures in family farming in Latin America.





# CHAPTER 1

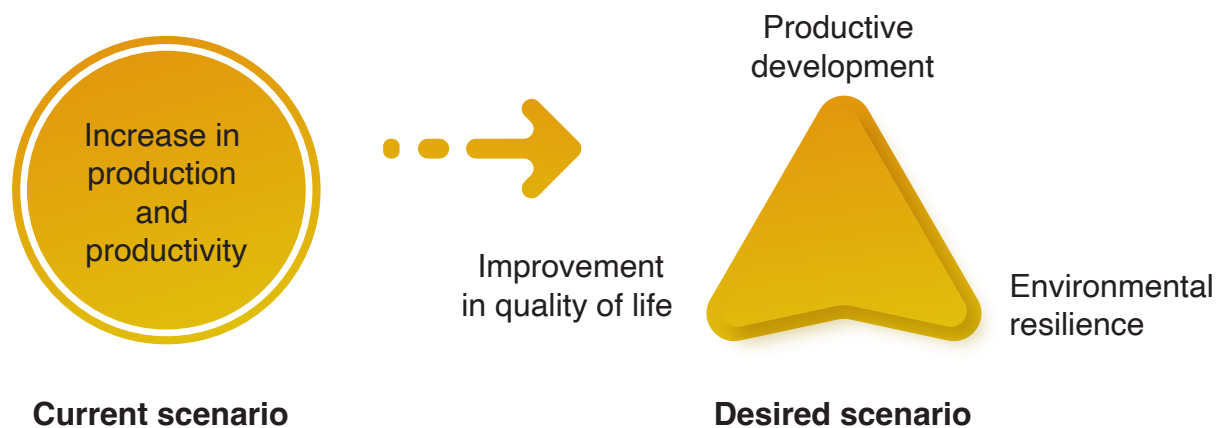
**Why Can Innovation Contribute to Building a More Resilient Rural Development Model?**





The basic idea behind the INNOVA AF program is to generate new practices through innovations and learning for family farming to become much more resilient and better adapted to climate change. Ultimately, this would make it possible to move from a rural development model, which in recent decades has emphasized increased production and productivity as development vectors, to a model that emphasizes the consolidation of a triad among a) resilience and environmental sustainability, b) improvement of the quality of life, and c) productive development. Figure 1 presents this transition.

**Figure 1: Transition of rural development models**



To build this passage or transition towards a new rural development model, encouraging the generation of innovations and new knowledge is critical to allow family farming to construct new ways of doing and producing. Next, the focus will be on understanding the role of innovation and expertise in this process and how they articulate with each other, generating virtuous dynamics that allow scaling to various areas beyond the production system.

### 1.1 The relevance of innovation around climate change adaptation

Innovation can be defined as creating a new product, process, service, or management model that helps solve a specific problem. An innovative process can be the introduction of a new product, production method, marketplace, raw material, or other management methods in general.



Innovation is not just built anyway and in any place; experience shows how the existence of a favorable economic, cultural, political, and social context can stimulate innovative behavior<sup>1</sup>, which leads us to affirm that innovation is not an isolated act or the result of an individual action of a person or group, but instead of an interactive process that brings together the knowledge and abilities of many to solve everyday problems<sup>2</sup>. This highlights two elements, on the one hand, the importance of social fabrics in which there are links of cooperation and exchange, and on the other hand, the centrality and importance that the territory acquires as a circle of proximity in which these networks of social interaction occur over time.

Taking into consideration that stakeholder and territorial networks allow us to broaden our perspective and understand that innovation is not linked only to technological and economic processes but also involves other circles of community life, which include, for example, the creation of new mechanisms for environmental management, the preservation of landscapes, the recovery and enhancement of heritage, the construction of the social fabric, and the socio-territorial animation in depressed areas, among others<sup>3</sup>. Thus, innovation should be seen as the generation of new ideas and activities that can positively impact the territory as a whole and as a collective construction to overcome the problems faced by the regions in the current context of climate change.

Every innovation process is built around a knowledge base, understanding knowledge as the set of information stored through experience, learning, or reasoning. There are no innovation processes without knowledge, and there is no knowledge without innovation processes, as both dynamize and reinforce each other.

Knowledge is rooted in action, procedures, routines, ideas, values, and emotions . Two main types of knowledge can be recognized - codified and tacit. Codified knowledge is produced through scientific activity and exchanged through technical language and education. The knowledge is something proven and can be obtained through different market channels.

Tacit knowledge, on the other hand, includes knowledge, skills, and competencies that are created and reproduced through various forms of social interaction, often the result of particular ways of doing things, which are transmitted informally and propagated by people in their usual practices, hence its original character and difficult replicability and transmission.



<sup>1</sup> Schumpeter, 1934:132

<sup>2</sup> Moulaert, 2009; Howaldt et al, 2016

<sup>3</sup> Howaldt, Domansky and Kalekta, 2016; Pyburn & Woodhill, 2014

<sup>4</sup> Nonaka, 1994, cited by Souza, Menezes and Revillion, 2018





Tacit knowledge is usually shared and reproduced in areas of proximity (same zone or location), and its transfer requires significant quotas of trust and reciprocity. For this reason, Brusco proposes to define them as "local knowledge" so that they come from:

*"The intelligence, imagination, and ability of people who live together and exchange news and experiences by working together." This local knowledge is passed on by doing things and watching others do them through casual chat. The language used for this transmission is full of local and idiomatic expressions [...] [so that] this knowledge is necessarily rooted in a specific area where people are united by the bonds of a shared history or values and whose specific institutions work for the benefit of the people.<sup>5</sup>*

Both forms of knowledge, whether codified or "scientific" and tacit or "local," are not opposed or mutually exclusive. On the contrary, the success and possibilities of development of the territories depend to a great extent on their integration, so that the knowledge of producers or artisans, for instance, even when it may initially be based on the knowledge obtained through formal education, it is intensely nourished by the gained ability and experience. Consequently, learning processes involve both formal and informal research and development training activities of which agents are only sometimes aware. These different learning processes accumulate in people and groups over time, becoming evident in developing new methods, practices, and products that later become essential in creating an activity or territory. Thus, the actual development capacity of a region is the result of integrating both types of knowledge.

How this knowledge is managed, created, disseminated, and reproduced is critical since it ultimately allows societies to learn and build better development processes<sup>6</sup>.

In this sense, we define knowledge management as the set of processes that favor the creation and exchange of knowledge -whether codified or tacit-, in this case in agriculture and in the rural world in general, to improve production capacities and, in our specific case, climate change adaptation. Although technical and scientific organizations play a significant role in knowledge management, this activity includes agricultural producers, who play a crucial role in generating, validating, and disseminating knowledge.

Knowledge management is the set of processes that favor the creation and exchange of knowledge -in this case, in agriculture, and in the rural world in general- to improve production capacities and, in our specific case, climate change adaptation.



<sup>5</sup> Brusco, 1996: 66

<sup>6</sup> Brusco, 1996; Rullani, 1994, Poma, 2000, Boscherini and Poma, 2000



## 1.2 Innovation, knowledge, and construction of new rural development models

We follow Geels' proposals to understand the virtuous dynamic between innovation and knowledge and how they contribute to social, productive, and territorial change. This author states that the articulation between innovation, learning and social and productive change should consider three main elements or levels of analysis - a) the innovative processes, b) the socio-technical regime (or development model), and c) the socio-territorial context in which these processes take place.

**Scaling up innovative processes.** According to Geels, the emergence of innovative activities or processes, for example, the incorporation of new technologies for water management in semi-arid regions, initially represents a niche activity, a very particular and unique innovation, which may not be sustained in time, or perhaps it may be an embryo of future changes.<sup>7</sup> For this innovation to go from being an isolated or unique experience (or a niche activity) to being part of the stable functioning of a production system, scaling up these experiences is necessary. This means expanding and multiplying these innovations and involving more stakeholders by increasing and deepening the positive effects generated by these innovations<sup>8</sup>.

Scaling up, then, constitutes a maturation stage of the innovative process rather than just a subsequent step. Scaling up is achieved with support policies, enhanced knowledge, and greater dissemination of new ideas with the funding of investments. It is essential to differentiate the scaling of an innovation process from the sustainability of an innovation. The goal of scaling up is to increase the quantity and quality of the positive effects derived from the innovation, for example, increasing the number of people served or expanding the territories benefited by the innovation process.<sup>9</sup> On the other hand, the sustainability of the innovative process implies generating the conditions for said innovation and its effects to be sustained over time. Innovations are commonly developed, and great efforts are made to support them, taking advantage of the positive dynamics they have generated; however, this does not mean that there is an escalation or that innovation processes and their positive impacts have multiplied. On the contrary, these processes have been circumscribed to the same territory where they were generated and to the same stakeholders; therefore, they were not multiplied, nor were they transferred to other regions or social groups.



**The Productive Development Model.** The second key element to understand is the productive development model<sup>10</sup>, i.e., the set of technologies, production, and organization practices, regulations and standards, infrastructures, available resources (land, property, spatial organization), and socio-cultural discourses that support a particular form of organization of production. Each of the INNOVA AF projects in the different countries is part of a specific productive development model, which has been built throughout history and conditioned by the regional or national political, institutional, and economic context. Productive development models are stabilized over time and modified based on various factors, for example, changes in policies, migratory movements, and environmental changes.

<sup>7</sup> Fuenfschilling & Truffer, 2014

<sup>8</sup> Santhanam-Martin, Ayre, & Nettle, 2015

<sup>9</sup> Kalafatas, 2015

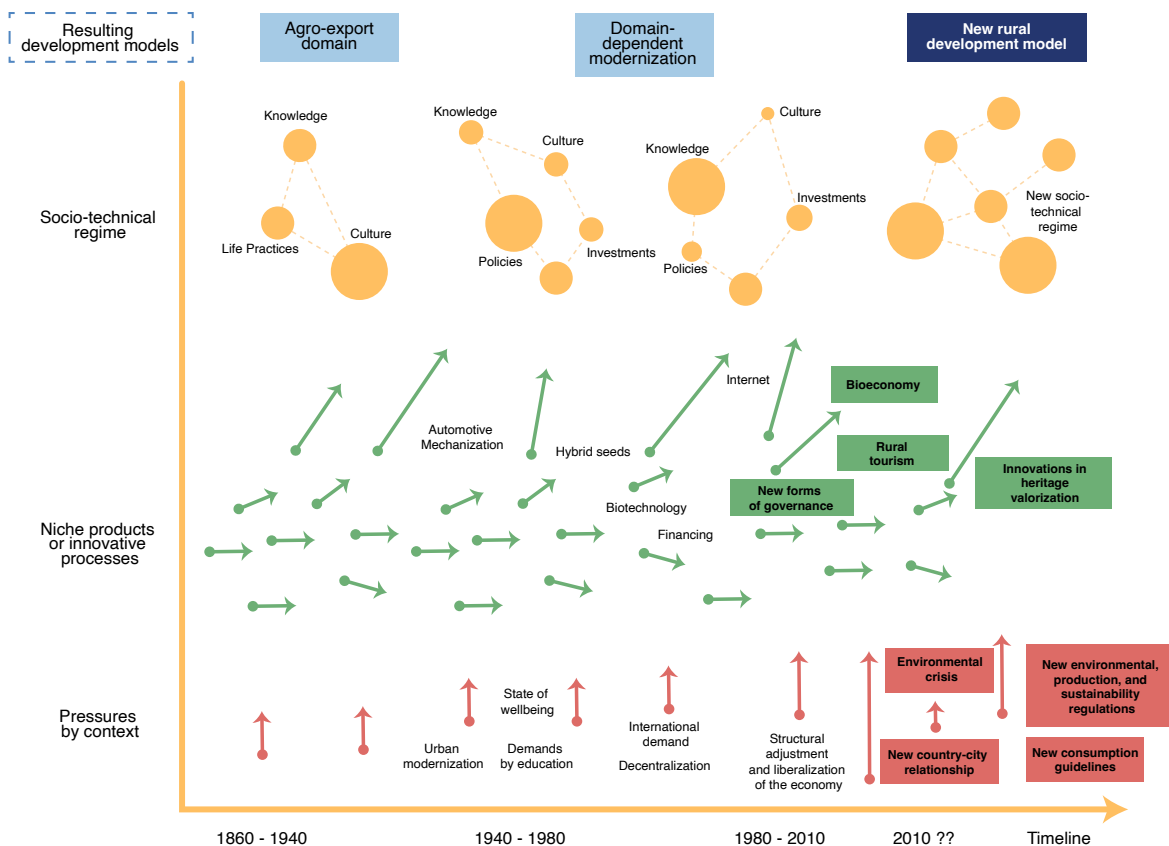
<sup>10</sup> En realidad, la teoría denomina a este modelo como un régimen socio-técnico, sin embargo, como una forma de facilitar la comprensión del proceso de innovación y su rol en la construcción del desarrollo, utilizamos el concepto de "modelo de desarrollo productivo". Para un mayor análisis y comprensión de esta dinámica el lector puede remitirse a Fuenfschilling & Truffer, 2014; Piattoni, 2009



However, a very decisive issue in changing these models is the innovations that are generated over time that modify the various elements of the system. Thus, for example, in the mid-20th century, the mechanization of agriculture drastically changed many production models. Also, the appearance of hybrid seeds changed the forms of production and yields, notably changing the scales and logic of production. In this way, innovations should not be seen only as new elements capable of generating jobs or increasing production but should also be valued for their ability to modify the productive development model, thus contributing to changing the dynamics of a territory.

**The Socio-territorial Context.** The third element to understand is the political, economic, and cultural context of a state or country where innovations occur. These context conditions put pressure on the existing productive model for its transformation. Thus, for example, the cultural change during the modernization process (expansion of education, new technologies, and media, among others) significantly changed the ways of life in rural areas and the relationship between the countryside and the city, thus changing the production model. For instance, the new citizens' demands for the environment and the quality of food products are pressing for the production model's transformation.

**Figure 2: General outline of the innovative process for climate change adaptation in FF**



Adapted from Geels (2002)

<sup>11</sup> Geels, 2002; Horlings & Marsden, 2014; Markard & Truffer, 2008; Truffer, Murphy, & Raven, 2015



In short, and as shown in Figure 2, the innovations that represent a novelty emerge in a specific territorial context that conditions them. Many of these innovations can be weakened, while others can be sustained over time and remain niche activities. Many other innovations can scale up and multiply, generating new knowledge and practices, integrating into dominant productive development models, transforming them, and generating new production conditions. These productive models impact the context, thus changing the rural development model, reconfiguring the forms of organization and the dynamics of societies. Rural areas are the case of interest in this work<sup>11</sup>.

Applying this approach in very general terms to the case of family farming in Latin America, we can see that the productive development model -that is typical of the agrarian modernization period -between 1960 and 1980- was characterized by the presence of mechanized agricultural activities, with the use of new hybrid varieties, and with conventional work and farming practices. Everything was under the protection of technology transfer policies from public organizations and private companies. From the cultural point of view, this model was based on the idea of urban modernity, which generated the abandonment of the countryside and the concentration of the population in towns and small cities, supported by the firm and massive use of vehicles, causing a consequent a model of specific territorial organization<sup>12</sup>.

In the 1990s, another type of production model was driven by new innovative processes, such as using new transgenic varieties, new production management practices, and new financing schemes for agriculture with networks of investors. These innovations, which at first were considered niche, were consolidated, substantially transforming the rural sector into a new model characterized by the presence of global service and biotech companies, with more complex production systems from the technical and financial points of view, with the production of highly exportable goods (soy, avocado, wood, and a great diversity of derivatives), and with a new articulation with the regional cities, which now played roles of organization in the new regime and accumulation of agricultural income.

However, the context conditions have changed substantially in recent decades; the environmental crisis derived from climate change, the COVID-19 pandemic, the new forms of relationship between the countryside and the city, and the new consumption patterns are generating new conditions around rural development. Faced with this situation, innovations are emerging everywhere that would make it possible to build new dynamics and other development paths.

Local stakeholders generate many of these innovations at the local level, while others are promoted by specialized agencies, producer organizations, and other non-local stakeholders.



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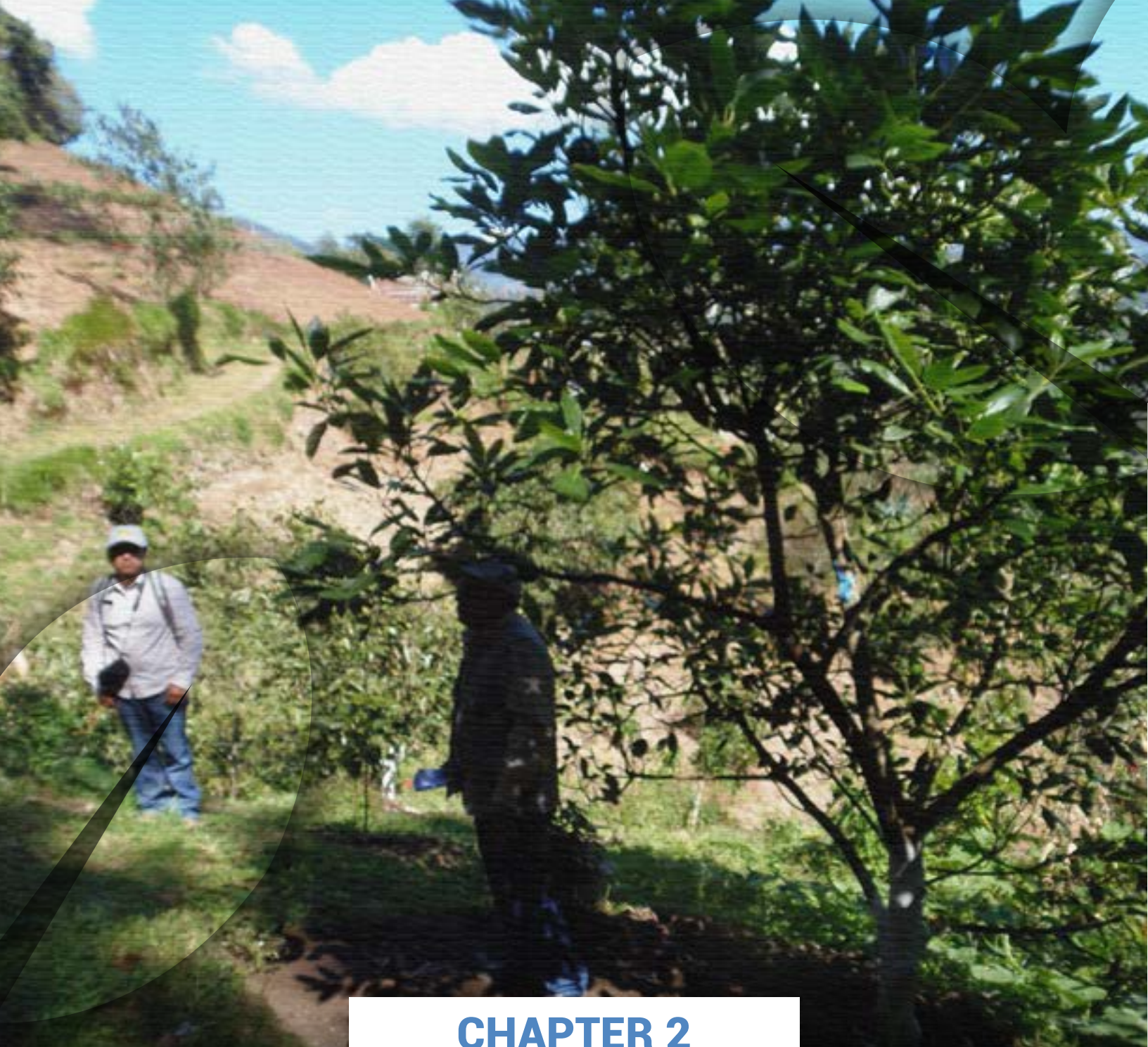
<sup>12</sup> Sili, 2018



The innovations and knowledge promoted through initiatives such as INNOVA AF can scale up and reconfigure the organizational forms of FF, allowing them to maintain and develop despite the new environmental conditions generated by climate change. This increased resilience would enhance family sustainability and contribute to building a new rural development model that is much more resilient and adapted to the latest global conditions.

In this way, all the innovation and learning processes generated from INNOVA AF, although they had already been conducted in different territories and experiences, should now be seen not only from the perspective of building greater resilience but also as an itinerary towards the construction of a new productive development model. This new model will be much more resilient, respectful of environmental conditions, with greater governance capacity, with strategies created by the stakeholders themselves, with a more significant cultural and identity load, and therefore with the ability to value the set of biocultural resources that they have in its territory, which can ensure conditions of sustainability of income and jobs. This constitutes an enormous opportunity for the future since, in population terms, FF represents the majority in the region.





## **CHAPTER 2**

**INNOVA AF as an Instrument for Changing  
the Rural Development Model**



## 2.1 The Experience of the INNOVA AF Program

Figure 3: Location of INNOVA AF projects

The Knowledge Management for the Adaptation of Family Farming to Climate Change Program (INNOVA-AF) aims to strengthen the capacities of family farmers with low resilience to the impacts of climate change in semi-arid territories and mountain systems.

The goal is for them to actively participate in rural transformation processes in Latin America and the Caribbean and to disseminate good practices for adapting family farming to climate change. For this, subprojects (work experiences) were implemented in rural communities where new practices were developed, and new knowledge was generated so that producers would improve climate change adaptation.

These subprojects were developed in eight countries – Bolivia, Brazil, Colombia, Ecuador, Guatemala, Honduras, Mexico, and the Dominican Republic, with 11 projects or initiatives benefiting more than 2,000 farmers (see Figure 3). The Competitive Fund allocated funds to seven meritorious projects. For Bolivia, Colombia, Mexico, and the Dominican Republic, it materialized into knowledge management initiatives led by IICA. Based on these experiences, the PCU should work on the identification and analysis of good practices for CC adaptation (knowledge, ideas, and innovative practices) so that, through a plan to capitalize on good practices, the generated ability could be scaled up and replicated in other territories and productive rural development projects.



The program was initially organized into four major components, although in the last period, they were regrouped to give rise to three major components:

- Competitive fund, through which funds were allocated to seven projects in four countries and four initiatives in four countries to develop knowledge management experiences.
- Alliances, agreements, and scaling up. This component aims to generate institutional arrangements to promote scaling up and replicate the knowledge generated through it.
- Knowledge Management. Through this component, instruments, materials, and processes were generated for the construction, management, and dissemination of knowledge.

The Program was executed under a network management model and public-private alliances, given the presence of numerous stakeholders involved from different countries.



A relevant aspect of the implementation was the very complex context given the COVID-19 pandemic situation, which forced a drastic reduction in fieldwork, reorganization of activities, and use of virtual mechanisms for communication and meetings (webinars, video calls). This was a challenge in rural areas, and the work deadlines had to be extended to be able to finish the experiences or subprojects in each of the countries. Nevertheless, a considerable amount of work was carried out permanently and documented by the PCU through numerous documents and files.

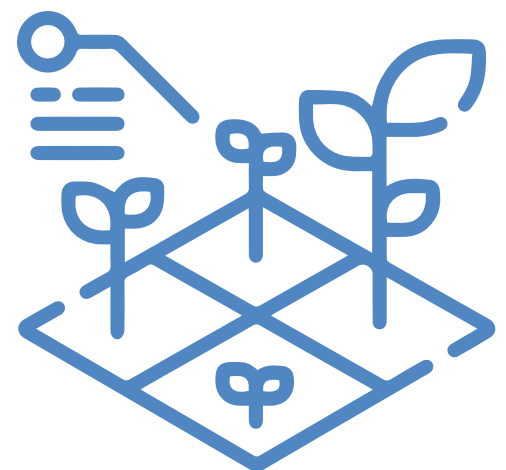
## 2.2 Stakeholders and Networks of INNOVA AF

This Program was characterized by constructing a vast network of local, regional, national, and international stakeholders, who, in one way or another, participated at different times and activities. IICA's institutional political relationships in the countries were used, thus facilitating the escalation process with the governing public entities in the territories and allowing the environmental and family farming policies of the countries to be involved in the actions of the projects and initiatives. In this sense, examples can be cited as a reference, including Brazil, Honduras, Mexico, Ecuador, and the regional level.

In Brazil, all the actions, especially those of the escalation plan, were articulated with the Secretariat of Family Agriculture and Development of the Semiarid Region (SEAFDS) and the Secretariat of Youth, Sports, and Leisure (SEJEL) to promote dialogues around the actions carried out by the organizations and with potential support for the public policy plans of the state of Paraíba. The activities concluded at a public-private event called "Routes of Innovation," in which the main strategic elements were systematized. These strategic elements were based on the experiences and lessons that were worked on to adjust the strategies of the State of Paraíba around climate change adaptation.

The Technical Cooperation Agreement between SERTA and SEAFDS/PB contributed to capacity building, marketing, and training of four SEAFDS workers as Local Development Agents. This ensures that the eco-technologies implemented in the Program can be taken to other territories of operation of the Secretariat. This is complemented by the alliance with SEJEL, a new initiative supported by this Secretariat. With resources from the Rural Poverty Control Fund of the state of Paraíba (FUNCEP), the installation of 40 more aquaponics is proposed for young people from the neighboring territory, expanding the practices of resilient agriculture and climate change adaptation.

In Honduras, the Ministry of Agriculture has established a dialogue space for capacity-building processes for rural producers in climate adaptation practices, such as Agroecology and Agroforestry.







This has been done by replicating the technical training courses and in alliance with the Honduran Institute of Coffee (IHCAFE) to institutionalize the climate vulnerability sheet for the producers' plots as a technical-didactic tool to guide the resilience actions that producers should implement on their farms based on the results obtained from the Data Sheet.

In Mexico, an alliance was created with CONAFOR (National Forestry Commission), which demonstrates that joint work and involvement allow for better appropriation by participating technicians on the Territorial Management Model. At the same time, from CONAFOR and in conjunction with IICA, it is possible to continue generating spaces for scaling up the Model, making progress towards the standardization of processes (Training Guide for Technicians and Operating Rules).

Also, in Ecuador, through adequate coordination with the Prefecture of Loja, it was possible to consolidate the technical board on drought in Loja and jointly manage a Program with a greater scope linked to the priorities and mobilization possibilities identified by the Ministry of Environment, Water, and Ecological Transition (MAATE), together with potential partners for climate funding and institutional stakeholders at the territorial level. Furthermore, the Loja Entrepreneurship Platform for Family Farming was formed under the leadership of the Prefecture of Loja, to provide services to strengthen family farming enterprises.

At the regional level, INNOVA AF was articulated with IICA's Hemispheric Program for Climate Action and Agricultural Sustainability, which led to a regional analysis to deepen the issue of the Implementation of Nationally Determined Contributions and their link to the Agricultural sector, especially regarding Family Farming.

These dialogues, implemented in the eight countries of intervention of the program, were attended by the main entities and public authorities that record and present the indicators and achievements of the countries to the processes of adaptation and mitigation to climate change, that is, the country goals.

### **IICA's Climate Action and Agricultural Sustainability Hemispheric Program**

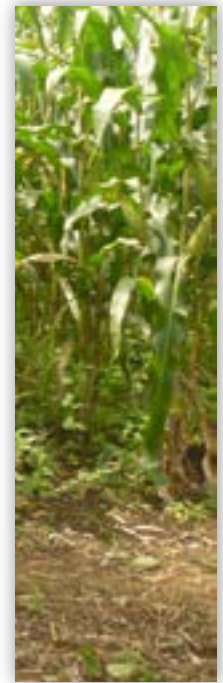
The goal of this program is to support countries in institutional strengthening, technical capacity development, and knowledge management that allow efficient, climate-resilient, and low-carbon agriculture. It focuses on matters related to the sustainability of natural resources, particularly soil and water, and on risk management associated with agricultural and rural dynamics. This program integrates subjects related to innovation and technology and gender and youth, which constitute a key and cross-cutting part of its efforts.

IICA, 2019.





With them, it was possible to make visible the role that family farming systems can play, especially in all good practices and innovations that they already implemented, which should be accounted for and subsequently benefited with incentives for their outstanding contribution. These results were presented at the specialized meeting on family farming of MERCOSUR, whose agreements included the proposals from the report presented and the mobilization of technical efforts to begin the search for financial resources so that the expanded Mercosur countries can implement them, and a position can be presented at COP 27 to be held in Egypt.



# IN NUMBERS

## 713

Young people from the territories



## 1.127

Women



## 2.636

Farmer families

with low resilience to the impacts of climate change contribute to the development of their territories through the dissemination or application of at least 8 good climate-change adaptation practices.



## 865

Members of original towns

## 51.976

Indirect beneficiaries of the Program's activities in the territories

## 7

 Projects

implemented by strategic partners in the territories of Red COMAL and IHCAFE (Honduras), ASEDECHI and ASORECH (Guatemala), FEPP (Ecuador), SERTA and POAB (Brazil).



## 4

 Initiatives

of IICA -country and partners in Bolivia (FAUTAPO), Colombia (CATYPSA and JE Cooperatives and ANZORC Association), Mexico (PRODEZSA-CONAFOR), and Dominican Republic (Santo Domingo Cyber Park).

## 2.037

### Farmer families

learn and apply climate-change adaptation practices, thus improving their economic, social, and institutional systems.



## 599

 Representatives

Public and private rural extension systems are familiar with and have access to good climate-change adaptation practices, to incorporate into their service offerings.





**11.082**  
**People**

related to public or private stakeholders access the virtual resources generated by the Program.

**64**  
**Sessions**

of virtual exchanges and territorial workshops to strengthen adaptation practices or experiences.



**45**  
**Organizations**

Public and private companies in 8 rural territories integrate efforts to adapt and apply good climate-change adaptation practices.



**8** **Virtual Courses**

on capitalization of experiences, climate-change adaptation practices, family farming, and territorial rural development.

**128** **Events**

in territories, aimed at disseminating and promoting the scaling up of good innovative practices promoted by the Program in its territories and countries.



**40**  
**Technical videos**

to show the supported innovations, arranged in the different virtual platforms of IICA and partner of the INNOVA AF Program.

**38** **Technical documents**

on lessons learned, implementation of technologies, and climate-change adaptation practices.



Portuguese version





## **CHAPTER 3**

**Emerging innovations and efforts  
for their consolidation**



The emerging innovation processes and the efforts made to sustain and scale them up should be seen as a comprehensive, dynamic process that provides an innovative model for the practices and experiences. When we refer to innovation, it means that all the actions were conducted under the socio-technical scheme or model including all the networks and territorial strategic alliances. Therefore, the different innovations launched in INNOVA AF are presented and analyzed below, and subsequently, the scaling-up efforts proposed to multiply them.

### 3.1 Emerging knowledge and innovation around AF

The innovative experiences that have been carried out by the INNOVA AF Program are very diverse. To systematize them, they have been grouped into four large categories.

1. Innovation processes were generated in developing technologies and products, which traditionally represent the object of innovation policies.
2. Instrumental innovations were also identified, that is, in the creation or operation of instruments to promote climate change adaptation.
3. The third category is innovations in capacity building, that is, the innovative processes of training, dissemination of information, and generation of pedagogical material, i.e., the set of elements that allow the stakeholders to take on new attitudes and practices.
4. Finally, an essential category in this experience has been innovations in governance, that is, new forms of social organization to undertake and sustain the processes of adaptation of family farming to climate change.

All these innovations are presented below, exemplifying each with specific experiences that are linked through QR codes.

#### 3.1.1 Technological and product innovations

It is about the creation of new products or the implementation of new technologies that adapt to new environmental conditions and favor climate change adaptation, generating a more sustainable use of resources, greater resilience, saving resources, and ultimately also contributing to creating higher income, not only due to better sales but also due to lower production costs. There are numerous innovations in terms of products and technologies that can be seen at INNOVA AF. Some examples are the following:

- **Innovations in technologies and production systems.** These have been critical in INNOVA AF since numerous practices have emerged from family farming, aiming to adapt to the new climate change conditions. They use resources more rationally and combine modern scientific knowledge with ancestral and local knowledge from local cumulative experience.



Some of these innovations were: an integrated patio system, which combines rainwater harvesting, drip irrigation, vegetable production (outdoors and indoors), and fish and bird production, aimed at contributing to the food security of families and income generation, also making much more rational use of the little water available, especially in semi-arid areas.



Scan the QR code to see the patio system experience at **La Cartilla from ASORECH.**



Water reuse systems were a great novelty in the Borborema territory. The construction of these systems made it possible to generate a wide range of initiatives. They included exchange visits to learn about the systems adopted in the region, establishment of strategic alliances for successful development of experiences, and an alliance with NGOs, research, and public managers from the northeast state. The initiative trained six local masons, thus providing them with more autonomy to experimentation. In less than two months the effects on production were already evident in practice.

(Adriana Galvão Freire, Polo da Borborema/AS-PTA, Brazil)

The development of climate-adapted sustainable agriculture practices (ASAC) includes contour ditches or hillside ditches, agroforestry systems, minimum conservation tillage, ferrocement reservoirs, and rainwater harvesting. Improvement of irrigation systems (technified drip irrigation and ferti-irrigation, micro-sprinkling, and sprinkling).



Scan the QR code to see the experience of the irrigation **system from COMAL Network**



The development of new activities with intensive recycling and reuse of resources avoid waste and composting in deep-bed pigsties and chicken coops that also include rest and recreation areas.

Scan the QR code to see the recycling system experience on deep **bed litter flooring in pig farming from FEEO.**



Development and diversification of agroforestry systems in coffee plantations of producers. Developing and installing eco-technologies (Aquaponics, Biowater, Agroforestry Systems) for the sustainable rural development of the semi-arid region with a micro-enterprise approach, especially for the young children of family farmers. Innovations were also generated in terms of infrastructure and equipment, including creating ecological stoves, irrigation systems, gray water, reservoirs, and water recharge.



Scan the QR code to see the experience of new infrastructures on **Aquaponics from SERTA**



- **Product Innovations Through INNOVA AF**, new products have been generated, often not significantly developed in the work territories. Thus, many producers have diversified into goat production and its multiple derivative products (cheese, milk, hides), and the Nopal. New ventures were also created for producing agroecological bioinputs, including bocashi, supermagro, and sulfocalcium, for managing their agroecological crops at a low cost, being a source of employment in the community and income generation for producer organizations. The challenge of innovation has been generating a new product and doing it on a larger scale to make it sustainable over time.





The main challenge is to achieve economies of scale that make collection, transformation or commercialization processes financially viable. An alternative is the search for market niches that can be served on a small scale, but progress must definitely be made in this regard to achieve a tangible increase in territorial resilience.

(José Angel Domínguez Vizcarra, IICA, Mexico)

Scan the QR link to see the experience of  
**new products from POAB TERREIRO  
farming innovations-biofertilizers**



### 3.1.2 Instrumental innovations

It is about creating new instruments and methodologies that allow FF to adapt more quickly to the new conditions imposed by climate change. These have been very important at INNOVA AF since they allowed the creation of new products or production processes that boosted productive development under a focus on resilience and climate change adaptation.

Some of these innovative experiences were, for example:

- **Technical or methodological guides for the development of new products or processes.**  
*This was how, for example, the Methodological Guide for Territorial Management in Strategic Ecosystems was created. A Territorial Management Guide for Sustainable Development was designed and validated with a strategic planning approach to guide the productive activities of the common lands in the Semi-arid region of Mexico, taking into consideration the landscape and the climate change adaptation and mitigation actions.*

#### Participatory Integrated Climate Services for Agriculture (PICSA)

The PICSA methodology comprises 12 steps in 3 components that are: 1. Providing and discussing weather and climate information with farmers, including historical records and forecasts. 2. Joint analysis of information on options, crop irrigation, and livestock options. 3. Set of participatory tools for farmers to use information to plan and make decisions according to the circumstances of the climate and the economy of the families.



Scan the QR code to see the **Territorial Management Model for Sustainable Development, application of methodological guide**



The Participatory Integrated Climate Services for Agriculture (PICSA) methodology was implemented, thus strengthening and empowering families in climate knowledge. These guides were not only crucial for the improvement of productive and environmental conditions at each place where they were designed and applied, but they have also been tested and, in many cases, standardized in such a way that they can be implemented in other territories. Such is the case, for example, of the territorial management model for sustainable development.

- **Creation of innovative marketing strategies and spaces.** A widely recognized innovation in all the projects was the improvement of marketing processes in family farming. Several experiences can be considered. Producers and organizations developed their own production and marketing records. This was an innovation that substantially improved the management capacity of farms and marketing processes. Another innovation linked to the previous one was using digital marketing tools and social networks. It opened the doors to new opportunities for information and marketing of family farming products.

The creation of fairs also represented an organizational innovation since it allowed numerous family producers to sell their products under better conditions. The experience of the "Yacuri produces and consumes our own" Agroecological Fair, where the surplus of agricultural products from the producers are traded, is an example.

- **Novel technical devices and instruments.** In many projects, innovative technical methods and tools were created to analyze territorial conditions or productive management, either by producers individually or by producer organizations. Thus, a relevant case was the design and implementation of a climate vulnerability diagnosis of coffee farms and, based on said diagnosis, training and technical assistance plans were developed to reduce the effects of climate change in the coffee sector.





Scan the QR code to see the **Nanocomputers for Agriculture of the Future experience**

Bolivia's experience also stands out with implementing nanocomputers for measuring climatic variables. This way, producers combine ancestral knowledge with scientific knowledge. Additionally, solar panels have been installed in the farmers' plots to guarantee an independent electric supply for nanocomputers.



Scan the QR code to see the **vulnerability assessment experience of coffee farms to reduce climate change effects**

On the other hand, there is the experience of installing and using a network of rain gauges in the territory, which involves critical stakeholders (Academia, Institute of Meteorology, and local governments). This initiative allowed first-hand information to be more efficient for communities with less schooling and more straightforward language. The creation of the INNOVA Dominican Republic Knowledge Management platform is also a novel instrument that promotes climate change adaptation through improving information, especially the analysis of the lessons learned by different projects. Finally, it is also necessary to value the numerous initiatives launched into planning change, such as comprehensive action plans in coordination between local, provincial, regional, and national stakeholders. Although this could not be considered a *stricto sensu* innovation, it is so given the conditions and the trajectory of the territory.



### 3.1.3 Innovations in capacity building

These innovative processes enable the construction of new capacities through awareness, training, or dissemination of information. Although many of these actions are not innovative in the strict sense of the concept, they were so considering the context and the execution modalities since, for all the organizations involved, the creation and implementation of these initiatives was an extremely novel and disruptive process in their organizational history. These processes of creating new capacities aimed not only at producers but also at technicians, workers, and the public, because, ultimately, these initiatives intended to build a fresh perspective and new practices capable of improving climate change adaptation. These innovations have been, among others, the following:

- **Creation of training environments.** Innovative training environments were created or consolidated to generate new capacities for producers and their families. Thus, the Learning Centers for Rural Development (CADER) allowed the implementation of good healthy home practices, protection of natural resources, family farming, and monitoring maintenance practices in rainwater harvesting systems for consumption (SCALL). The Farmer School for Restoration was created to build capacity in farmers so that they can build, negotiate, and implement development projects that are comprehensive, profitable, inclusive, and respectful of the natural resources in their territories. The training courses for Local Development Agents to Live with Climate Change (ADL Clima) and Technician in Agroecology have strengthened local youth with technical educational support from strategic allies, who implemented the practices along with the beneficiary families and community. Implementing the Field School (ECA) is another innovation in training. It ensures better use and outreach to young women more effectively since they better understand the practices and technologies that are implemented in the project.





- **Awareness and training.** Innovative awareness and training processes were launched, crucial to generating new capacities and building a new culture and greater awareness of the need to face climate change. Thus, for example, the "The climate has changed, let's change ourselves" awareness campaign was created on the effects of climate change on their livelihoods. It was adapted to the context of the Covid-19 pandemic, going from face-to-face to virtual media through radio spots, social media posts, and bulletins, which had a greater reach than expected and designed for elementary schools. Numerous courses were also developed for producers and Local Development Agents associated with implementing eco-technologies: Aquaponics, Biowater, and Agroforestry Systems. A course on agroecology and vulnerability management in coffee farms was held, including all the technologies validated in the Program with written material, videos demonstrating practices, and agriculture management technologies to adapt to the effects of climate change.



Scan the QR code to see the awareness experience around **vulnerability in coffee farms - Dora and family: the flowering of new autonomy and sustainability paths**



The best way to learn is and always will be by confronting knowledge and experiences in a practical environment with new explanations and methods, which reaffirms, nourishes, or corrects what has been learned. However, it is very important that these moments are not isolated, but rather, against all administrative complications, they take place at chronologically timely moments according to the production processes, weather conditions, etc., so that they can be constantly replicated in working conditions, not only in terms of production techniques and innovations, but also in terms of strengthening the governance and institutionality of the organizational structures of the territory.

(Guadalupe Jozellin, Valencia Cruz, IICA, Mexico).

Numerous training workshops on climate change, courses on irrigation systems, diplomas on natural resources, classes on food preparation, and workshops on coffee production, entrepreneurship, and farm planning, among many others, were also held.



- **Development of pedagogical material.** Educational materials of a very different nature were generated to strengthen local capacities. They include technology manuals, bulletins on the historical evolution of the family in climate change adaptation, notebooks with outcomes based on studies carried out with farmers, explanatory videos, an e-book on territorial management methodologies, nutritional recipes, guides for construction, and many others.



Scan the QR code to see the **nutritional recipes experience**

Many of these products were very innovative and had a very high impact. Within this set of pedagogical innovations, the initiatives to systematize productive or development experiences should be noted, comprising true compendiums of practices, with an analysis of lessons learned and methodological considerations that can be applied in other contexts and territories.

Within the set of pedagogical materials, the videos, friendly notebooks, and methodological guides have been evaluated as the most relevant pedagogical instruments for disseminating information and generating capacities within the Program. This shows that although new technologies are practical and attractive for sharing information (simple and well-made videos), printed material is always a key instrument in rural areas where many people do not have connectivity or access to technological devices such as computers, tablets, or smartphones.





In the future, it will be necessary to produce knowledge products such as videos and manuals to post on social media and face-to-face virtual meetings to reinforce the lessons learned. Successful experiences should be systematized and socialized with partner or peer institutions to disseminate them. Successful experiences should also be incorporated into the curricula of technical institutes so that new agronomy professionals learn about it during their training.

(Marco Tulio Fortin, IICA, Honduras)

### 3.1.4 Innovations in governance

They are all the innovation processes in organizational terms that allow the production and development processes of the territories to be managed more adequately. INNOVA AF has been very prolific in the generation of these innovations, primarily through the creation or revitalization of networks and alliances, local councils, territorial boards, and water boards, among others. The role of the organizations is to articulate different stakeholders and projects aimed at development planning and management. These spaces are, in many cases, informal constructions, while in other cases they are consolidated through agreements or other legal and regulatory frameworks to give them sustainability over time.

Other innovations in governance are the creation of new institutional regulations or rules or the strengthening of organizations. There is an explicit acceptance by all the stakeholders involved in INNOVA AF of all the innovations in terms of governance that enabled moving from a self-referential logic, focused on the problems of each of the stakeholders, to a sense of building consensus and joint solutions.

In short, the innovations generated around governance made it possible to build innovative solutions around solving problems and constructing new itineraries for climate change adaptation. Some of the critical innovative processes that can be highlighted are, for example:

- **Construction of cooperation platforms or networks.** These platforms or networks are often informal, constituted from a common problem, which over time are institutionalized or formalized through different legal figures. These networks can be at the local, regional, or national levels. Still, they end up being constituted as multi-scale networks, which allow the participation of local organizations (producers, chambers, organizations, municipalities, departmental governments), or at the regional and national level, including the scientific and academic sector, and even at the international level with development agencies and international cooperation organizations (IICA, IFAD, and FAO, among others).



Since their creation, these networks have made it possible to better coordinate objectives, prioritize joint activities and processes, and in many cases, also carry out project follow-up and monitoring actions. An essential strength of these initiatives is their multi-scalar nature that makes it possible to identify and take advantage of opportunities for funding, technical assistance, or other types of resources. Another essential element for innovation processes is that from the construction of these networks, numerous opportunities for scaling up are generated, since local innovations can travel through networks and be transmitted and reproduced in other areas and territories. In this sense, the network or cooperation space can be understood as a vehicle for the transmission, dissemination, and scaling up of innovation processes.

In our work territory, both governance and the social fabric were found to be in a very deteriorated state, with a strong social erosion due to the migration of young people and internal conflicts. The fact of having actively involved men and women, young people and adults, made them decide to define rules for work and participation, reactivate the life of the shared land's general assembly -which is their highest authority-, and regularize commissions, committees, and other instances linked to community life.

(José Ángel Domínguez Vizcarra, IICA, Mexico)

- **Organizational strengthening.** INNOVA AF has generated numerous innovative experiences of organizational strengthening, a key subject for climate change adaptation and transformation of the productive regime of family farming. Multiple processes of self-organization and strengthening of producers, including producing, women, and youth organizations in various fields, took place.

Strengthening community organization and capacity development are a sine-qua-non condition for promoting sustainable rural microenterprises.

(Hugo Gamez Flores, IFAD, Mexico)

Through different awareness-raising and training mechanisms, organizations were strengthened to develop proposals to face the climate crisis. Work was also done on understanding and resolving gender and domestic violence problems and strengthening and improving producer organizations, thus providing them with greater capacities for administration and management. In addition, work was done with the organizations on creating standards and protocols for managing production and resources, thus providing the organizations or networks of stakeholders with innovative management instruments.





### 3.2 Efforts to scale up innovations and build a new rural development regime

All the above-mentioned innovations have been supported and scaled up by the network of stakeholders involved in the Program to ensure that they become common practices by family farmers and therefore become part of a new sociotechnical regime or, in other words, part of a new rural development model. The scaling process entailed tasks of mediation, encouragement, and promotion of innovation under two main logics - in a horizontal logic, that is to say, in the territory, helping to articulate stakeholders, encourage dialogue, and promote innovation in the same region with its multiple stakeholders; and in a multi-scalar logic, articulating and promoting dialogue with other various stakeholders located at different territorial levels (international cooperation, national governments, provincial and regional governments, and local governments and stakeholders).

The main challenge is to achieve economies of scale to provide financial viability to collection, processing, transformation, or marketing processes. An alternative is the search for market niches that can be served on a small scale, but progress must definitely be made in this direction to achieve a tangible increase in territorial resilience.

(José Ángel Domínguez Vizcarra, IICA, Mexico)

The combination of these two logics of encouragement (horizontal and vertical) has made it possible to manage resources and processes with different audiences and capacities and possibilities for dialogue.

The strategies the different stakeholders have put in place to scale the innovation processes for climate change adaptation are several and can be divided into major categories. Next, we are going to analyze the different strategies and efforts that were made.

**Raise awareness and train.** Most of the scaling-up actions are linked to this awareness and training strategy, which aims to build greater capacities among the stakeholders and society in general so that the innovation processes are accepted and taken on. This strategy, which has been the main one, has given rise to numerous experiences, including the publication of the knowledge generated in video format or booklets or books, teaching of face-to-face or virtual courses, exchange trips, and presentation of climate-change-related problems in different press and television media.



**Inclusion of methodologies and concepts in broader policies.** Other fundamental and effective scaling-up strategies are about including innovative processes in public policies or basic concepts, primarily through protocols or methodologies, many of which may be mandatory by regulatory government agencies, such as government planning rules that are enforceable at the national level. Some experiences in this regard are the inclusion of materials from the INNOVA AF Program in the courses and activities of different projects underway and the incorporation of new knowledge in IICA's initiatives in Brazil; the incorporation of the information generated by the nanocomputer projects into the national meteorology services; and the inclusion of the methodological guides developed at the projects, into the rural development processes of different countries.

**Political lobbying and stakeholder networks.** Another type of strategy to achieve the scaling-up of innovation processes is political lobbying and the promotion of multi-scalar networks. Thus, in many cases, strategies more linked to negotiation and political lobbying were proposed, which made it possible to build spaces to expand the scope of the projects or multiply them. Some experiences in this sense are the conformation of shared work groups to negotiate and scale up projects, the linking of local projects with national policies to obtain resources to support and scale up local projects, the formalization of agreements with other stakeholders to guarantee the activities of the project and move on to new stages, among other initiatives.

Municipal Technical Board for Soils - to influence, coordinate, and manage measures for the protection and sustainable use of soil resources for family farming. A socialization process was generated between different relevant stakeholders (mayors, representatives of the public sector, NGOs integrated to instances such as COMUDE, COMUSAN, CONRED, CODEDE, CUNORI, who add between 20 to 25 representatives) for the confirmation of a network and to look for the commitment to establish an alliance that promotes soil protection actions and adaptation practices.

**Implementation of projects.** Finally, the last type of strategy followed to scale up projects consists of replicating the same experience in other territories through a new similar initiative. This is the most direct type of strategy and has been carried out on several occasions. For instance, in Honduras, in Guatemala -in the ASORECH and ASEDECHI projects-, in Brazil -with the IFAD Goat Route-, or in Mexico -with the replication of the territorial management model for the sustainable development of the semi-arid region-.





## **CHAPTER 4**

**Lessons Learned, Challenges, and Future Strategies  
to Consolidate a New, More Resilient Rural  
Development Model**



How to consolidate the processes of innovation and change? What strategies can be proposed to guarantee climate change adaptation and the emergence of a new development model for family farming in the future? We propose in this chapter to provide insight to answer these major questions. To that effect, we will focus on analyzing what we have learned to propose new strategies that allow us to build the transition toward new rural development models.

#### 4.1 13 lessons learned about the processes of change and climate change adaptation.

The entire innovation and knowledge generation process carried out within INNOVA AF has left a significant accumulation of findings and lessons learned, which constitute the basis for thinking about new climate change adaptation strategies. This also shows a path to design and build new rural development models in the region.

Next, we present and discuss the lessons that INNOVA AF has taught, considering different lessons. First, we analyze the lessons that have emerged around governance. Here, we see the processes, articulations, and work methods that have worked and contributed to innovation development and scaling-up.

Secondly, among the lessons learned linked to project management practices, we identify elements that should be considered to improve management of the projects or programs that follow these routes. Thirdly, we focus on the lessons learned around the types of technologies used and the products generated, with the aim to understand the most effective technologies to face climate change or the type of products that are viable in these contexts. Finally, we focus on the lessons learned in terms of capacity development, to understand which strategies have yielded the most results and what elements we should take into account to improve the impact of our initiatives.

##### 4.1.1 Learning around governance

- 1. Paternalism and lack of participation inhibit or prevent innovation processes.** Facing that reality, INNOVA AF has shown that with the participation of stakeholders, new, more autonomous development dynamics can be created. This will overcome a top-down paternalistic logic that is not very sustainable over time, which is still implemented in many countries and development projects and programs.

Building virtuous innovations to adapt to climate change is not possible without the active participation of family farming.



Therefore, proposing a clear strategy involving the population -especially young people- is crucial. This has shown to be a key factor in the construction of new change and innovation schedules, since the inclusion of young stakeholders with high potential to become community leaders contributes to shared responsibility and local empowerment.

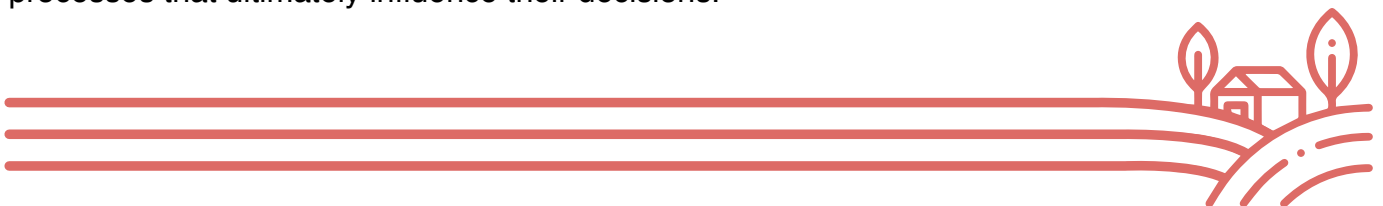
It should be considered that the participation and empowerment process of local stakeholders and their local governance bodies (such as common lands, municipalities, and prefectures) takes a long time. Therefore, involvement strategies should be included in the stages of diagnosis, planning, management, and assessment of projects and programs. They should also consider the different paces and social, cultural, political, and institutional dynamics of the territory.

- 2. The lack of coordination among stakeholders prevents building innovation and development dynamics.** INNOVA AF has demonstrated experiences to overcoming this problem through the creation of networks and spaces for negotiation and consensus. It is not only about local stakeholders, but also the different partners linked to these problems at a regional, national, and international levels. The creation of stable cooperation networks enables the development of activities for which groups and communities are not often well prepared or do not have the resources and time to do so.

Within this new historical context of globalization, it is essential to build new relationships among the local, national, and global levels, and at the different territorial governance sectors.

On the other hand, multi-scale linkages are a good opportunity so that projects are not limited to the local level and can be scaled and expanded. They also help transmit and lobby public policies at the national level in order to obtain support and coverage for new local initiatives. Advances in information and communication technologies should also be used so that family farmers can link up with the final consumers of their products or services.

**Linked to participation and multi-scale networks**, an instrument that has proven effective in ensuring the sustainability and scaling of projects has been the creation of multi-stakeholder spaces or platforms where multiple stakeholders can identify the needs of the territory, exchange initiatives, and find solutions that are sustainable over time. They can also jointly manage and implement different activities. These spaces play a very important role in the exchange, cooperation, and learning of new dynamics. These tables or spaces for cooperation have notably contributed to creating and multiplying connections with various public-private actors, generating new investment opportunities, products, knowledge, etc. In these spaces, local governments are fundamental since many of them have the historical memory of both successful and failed processes that ultimately influence their decisions.





### 4.1.2 Learning around process management

**3. When planning theoretically without considering the local context and historical conditions, innovation and development processes fail.** Faced with this situation, we believe that it is necessary to adequately plan the innovation and climate-change adaptation processes, valuing the context and history of the territory and its actors. The innovation processes should be thought out and planned, with the consensus of the stakeholders. The projects or programs must be very well formulated and agreed upon, considering that farmers and production systems have a history and a trajectory on which they must rely. This has several implications when thinking about and formulating a climate change adaptation initiative:

a) the work that is being done should consolidate through the capitalization of experiences. This is to say that one should not assume that the dynamics or actions had never been generated.

b) do not leave the processes to chance, but plan them, and

c) given that innovation processes have a history, and are necessarily relational, it is necessary to properly articulate them with informal or unstructured initiatives or actions that are already underway in the territory, or with more formalized initiatives included in existing development plans in the territory.

*Climate change adaptation and the construction of a new model of rural development in the territory should be properly planned.*

This way, any innovation process will be consistent with the dynamics of the territory, emerging from real needs, and not because of top-down initiatives without local anchorage and especially knowledge of local governments.

*It is necessary to create committees to promote projects, which are responsible of invigorating and monitoring the operational commitments of the project. This generates a high degree of identification with the project on the part of the organizations and allows the technical teams to carry out their work in the territory without setbacks, even in times of worsening of armed conflicts.*

*(IICA, Colombia)*

**4. When there are no good baseline diagnoses, innovation and development processes don't solve the problems of farmers and the territory.** That is why it is necessary to have clear diagnoses and adequate community understanding of the current conditions and the development perspectives of the stakeholders. Having a clear diagnosis of limiting situations is essential, both in terms of production and environment, but also of the social dynamics of the community, its stakeholders, strategies and action logic, and its institutional ecosystem. This diagnosis should be based on quality information and be duly organized so that the factors of success and failure are clearly identified.



5. **The most effective and sustainable processes of change and innovation in the face of climate change are those that include follow-up, monitoring, and assessment of the actions throughout the project.** These follow-up mechanisms facilitate correcting deviations from the objectives and goals set and record the impacts and results obtained throughout the project. It is important that these processes are led, promoted, and managed by the stakeholders of the territory and the public-private institutional and organizational ecosystem. Monitoring and promotion instances include committees, agencies, action groups, etc., who are responsible for encouraging the innovative process.

It is very important that a certain degree of formalization is generated in the management process, such as protocols or operational manuals that are easy, simple, illustrated, and practical. They should orient and guide the processes, thus allowing their escalation over time. Any protocol or operating manual should be open and flexible enough so as not to condition or limit innovation processes.

*Es necesario crear una cultura del seguimiento y evaluación de nuestras acciones, debe existir un punto de partida para medir si las acciones contribuyen o disminuyen la vulnerabilidad del territorio.*

6. **There are issues to systematize and document the processes of change.** It is necessary to resolve this limitation to generate greater learning and scale up innovation processes. The INNOVA AF experience shows that in order to sustain and scale up innovation and adaptation processes in the face of climate change, it is essential to systematize and document all the activities launched, progress made, and the knowledge acquired.

Recording the process is important because it allows better follow-up, monitoring, and evaluation activities, and contributes to organizing knowledge and scaling up processes more effectively. The documents generated, of different types and formats, should be open, clear, and well written and presented, with a simple language oriented to fieldwork and with explanatory illustrations, since they represent the memory of the projects and work instruments to be shared by all the stakeholders in the territory.

Without adequate systematization and ordering of information, actions can be disorganized and chaotic, thus generating a very important waste of time. In addition, they would not generate learning or an adequate capitalization of experiences.

*Documentation of processes and changes is the best tool to learn and build new development paths.*





Furthermore, continuous communication during the entire process is essential through easy and simple strategies, such as videos or short brochures, which turn out to be very effective in publicizing the different experiences and innovations.

The experiences of change should be assessed by the local stakeholders and transferred to other stakeholders so that initiatives can be learned and scaled up. Visits to other experiences and their dissemination are key to multiplying and scaling ideas and projects. Through different graphic tools and different duly systematized documents, it is sought to order the process of change and make it visible, to scale it up and consolidate it over time.

- 7. Changes and innovation processes cannot be built without technical support.** The technical support by the extension agents, both to train and to assist the technical and organizational processes, has proven to be essential. However, this constitutes a strong challenge for technicians since they should take on new methodologies and practices around new environmental problems.

In this sense, knowledge about traditional production systems (many of which were responsible for serious environmental problems) is not enough. There should also be new ways of producing and managing the environment. It is essential to update the extensionists' curricula, not only based on productive issues, but also on innovation management, process mapping, and supplementary tools so that their work is more effective.

*Farmers need a long period of time to master the new technology, and, in many cases, they give up before doing it because of obstacles that they cannot overcome with their own efforts, which can frustrate their expectations regarding the received technology. With the constant support of technical assistance and mobilization, their training skills will be fulfilled, and they will see that their skill levels improved. Thinking about a continuous methodology that turns the progress made into improving the capacities of the beneficiary seems to be important. Perhaps ask the beneficiaries to record their daily activities of the project and their "conquests".*

*(Edwin Prado, IICA, Brazil).*

- 8. Proper project management can become a key factor in adapting to climate change.** INNOVA AF has shown once again that projects can be successful when there is appropriate management at the level of producers or organizations. Good management means being efficient with the use of time and resources, leveraging the numerous opportunities for alliances, networks, and funding. That is why innovation initiatives and processes require good management to streamline processes.







It is necessary to organize the accountability of the organizations appropriately, by ordering the accounting and keeping good records.

This is also crucial in the face of the opportunity to raise funds from donors outside the territory. This occurs when there are no good administration mechanisms to raise external funds that, instead of leveraging innovation processes, could alter organizational management and the construction of a development dynamic.

It is the duty of each intervention to strengthen organizations in these matters so that transparency is the basis of any action carried out in the territory.

#### 4.1.3 What did we learn about the technologies and products?

**9. There is strong resistance against the use of new technologies.** The opening of family farming to incorporate new technologies and combine ancestral knowledge with scientific knowledge is noteworthy. New technologies are key to development, but they must be appropriate and adapted to the cultural conditions of the population. This way, they can be effective in production, management, and communication technologies.

Four elements appear critical. Firstly, an effort must be made in technological training adapted to local social contexts; secondly, the infrastructure conditions available in rural areas must be taken into account, since in many cases weak connectivity limits projects based on communication technologies; thirdly, there must be a local market capable of offering said technologies, given that technological solutions are useless if they are not available in the local context at an affordable price for producers; and finally, it is necessary to raise funding for the procurement of such technologies.

*It is necessary to involve participants in the designs of the technologies, from the beginning, to encourage their commitment and knowledge of what is going to be applied. Apply technology and learn by doing in the implementation of technologies. Inter-institutional relations should promote the scaling up of technologies and water governance, the management of small animal breeds, and the involvement of young people and institutions to facilitate commercialization.*

*(Populorum Progressio Ecuadorian Fund - Ecuador)*



**10. Although water use and management technologies are not new, they have been key in building production systems that are more resilient to climate change.**

The reforestation of micro-watersheds, legislation, and local governance regarding the use of water in water reservoirs, the use of filters and the reuse of gray water, micro-drip irrigation systems, rainwater harvesting in ferrocement tanks or plastic water tanks, the construction of hillside ditches to direct runoff to be used as water reservoirs, and the use of micro drip irrigation systems, among others, are practices that have contributed to substantially improve production capacity and adapt to climate change, especially in contexts of prolonged periods of drought.

*Proper water management and the generation of new agroecological practices appear as the key factors in building a more resilient and sustainable future.*

**11. Agroecological and bioinput production emerges as a new paradigm.** The productive projects within INNOVA AF were directly linked to new forms of agroecological production and the production of bio-inputs for use either by the same farms or with a more commercial purpose.

This points to a whole strategic path for the future of family farming, since new forms of production that are much more respectful of the environment are adopted with lower costs. On the other hand, the production of bio-inputs has emerged as a great opportunity for producers since they are easy to produce, generate income, and improve the diet as they protect health by reducing the use of agrochemicals, thus contributing to improve family living conditions. These practices are part of what is called the circular economy or bioeconomy, where the largest number of by-products or waste from productive activities becomes an opportunity to increase income and improve resilience.

#### 4.1.4 Regarding capacity building

**12. The exchange and dissemination of experiences have proven to be key to generating new knowledge and building a favorable environment to innovation and climate-change adaptation.** A strong lesson learned from INNOVA AF is that learning and changing attitudes and practices in the projects has been made viable and significantly enhanced thanks to visits to the experiences by other producers, and the dissemination of e-books, newsletters, practical guides, testimonials, videos, etc. The exchanges and dissemination material make it possible to create an environment that is necessary for the construction of new rural development models. The important thing is that it is a matter of not only exchanging technological experiences, but also ways of doing, linking, and management models. This learning dynamic is possible thanks to the use of social networks and of the websites of the Program and the institutions involved. Through these tools, technical information and news have been generated and shared, so that the stakeholders in the territory, who carry out similar activities, can be aware of the initiative, and possible ties of cooperation or synergies can be built in future actions.





*The best way to learn is and always will be by confronting knowledge and experiences in a practical environment with new explanations and methods, which reaffirms, nourishes, or corrects what has been learned.*

*However, it is very important that these moments are not isolated, but rather, against all administrative complications, they take place at chronologically timely moments according to the production processes, weather conditions, etc., so that they can be constantly replicated in working conditions, not only in terms of production techniques and innovations, but also in terms of strengthening the governance and institutionality of the organizational structures of the territory.*

*(Guadalupe Jozellin, Valencia Cruz, IICA, Mexico).*

- 13. 13. To transform the rural development model, more soft and organizational skills are needed.** The experience from INNOVA AF shows that there are issues that are key to the development of family farming and its adaptation to climate change that should be promoted. Some of those issues are:

*Family farming must organize itself day after day to face the new challenges of climate change.*

- a. Training around the improvement of communication, expression, and negotiation skills. This has been key since the groups and producers who were trained on these issues have been able to substantially improve their linkages with other stakeholders, especially with the suppliers of inputs and with the buyers of their products and services. These communication skills allow them to integrate and supplement the technical and financial cooperation support they receive from various organizations, thus achieving a greater impact on their group and community.
- b. Training in organizational management is essential for their strengthening. The improvement in knowledge about the functioning of the organizations has allowed the participants of INNOVA AF to regulate the operation of groups, with internal regulations and record management -such as invoices and all the documentation of the group- that allows a better system of control and facilitates decision-making, thus reducing arbitrariness in the use of resources and levels of conflict.
- c. Training in project design, management, and assessment. A development and governance model will necessarily imply adopting monitoring and assessment systems that ensure the implementation, control, transparency, and sustainability of development projects. However, it is imperative to generate new capacities in these subjects to do this.



d. Finally, INNOVA AF has shown that the construction of a more entrepreneurial vision by the producers and the establishment of good organizational practices, with cost and gain record systems, and a greater programming of production and commercialization allows to improve and sustain their income.

## 4.2 Guidelines and Challenges to Consolidate a New Climate-Change Adapted Rural Development Model

All these lessons learned from INNOVA AF lead us to think that there is a possible way to build new models of rural development in the region. However, it is necessary to consider several general guidelines that support or guide the construction of this new path of rural development policies. These guidelines, which are presented below, are also based on the lessons learned and the dynamics of rural development in the region.

1. **Climate change adaptation necessarily implies generating a new production model.** A clear lesson learned from the INNOVA AF Program is that to build sustainable rural territories adapted to the new context of climate change, it is necessary to move towards a new production model, one that surpasses the conventional model, based on the generation of new knowledge and innovations. Moving towards diversification and sustainable use of the biocultural heritage of the territory (non-timber native species, nature tourism, traditional medicine, backyard production, value addition in production systems, etc.) is essential.

*The implementation of practices and technologies for climate-change adaptation have contributed to an increase in production and family income. They have also contributed to the reduction of workloads, especially for women producers.*

*(Donaldo Zúñiga, COMAL Network, Honduras)*

The doors should be opened towards new agroecological practices that allow for a substantial reduction in costs and contribute to improving environmental conditions. Disease control practices and the Patio Agricultural System appear as highly valued strategies with high local impact. We must also think about new forms of governance and highly innovative alternatives, technological solutions, and instruments that are more adapted to these conditions.

However, a key lesson learned is that building new itineraries and more sustainable development models cannot be solved only with innovative local processes. It also requires structural public policies capable of supporting and accompanying local initiatives, generating new local management capacities, promoting sustainable and resilient production models, and solving structural problems of the territory.





Here, the municipal and state governments provide an excellent example of this.

*La implementación de las prácticas y tecnologías de adaptación al cambio climático han contribuido al incremento de la producción y de los ingresos de las familias. Asimismo han contribuido a la disminución de las cargas de trabajo especialmente de las mujeres productoras.*

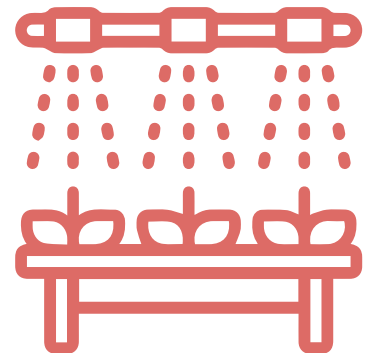
*(Donaldo Zúñiga, Red COMAL, Honduras)*

- 2. Family farming is essential to build more resilient and sustainable rural territories.** The first lesson learned is that, as the INNOVA AF Program has shown, family farming is critical in building innovations to adapt to the new climate change conditions and to generate quality information on the climate. An example of this is the construction of networks and the organization of producers. This is strategic to collect meteorological information and generate data to understand the behavior of rainfall in the community and make decisions to mitigate the negative effects of drought.

Producers can also contribute to knowledge about climate dynamics with traditional practices to predict how the rainy season will affect, for example, the flowering of plants or other natural phenomena.

Furthermore, family producers can significantly contribute to counteracting the effects of climate change by generating or adapting effective practices, such as planting various crops, implementing climate-adapted sustainable agricultural practices, the patio farming system, and the use of wood-saving stoves, among many other measures to mitigate climate change. This shows that family farming is not a passive sector, dependent on public policies, companies, or technical personnel; on the contrary, it is a dynamic sector, building its realities but clearly living immersed in contexts with great difficulties that often limit or prevent their development. There is no immobility or passivity in FF, but instead a dynamism that needs to be accompanied.

To effectively contribute to generating these innovations and building new development models, it is essential, as the INNOVA AF Program shows, to generate two primary conditions:





a. Creating minimum structural conditions is necessary for life in rural areas, including the provision of public infrastructure, equipment, a guarantee of peace, access to land, and extension services.

b. Building adequate governance mechanisms with a multi-scalar relationship (local-global) that is more synergistic and respectful of local stakeholders, to set up networks and opportunities to build their development dynamics.

These two structural factors, added to good awareness and training strategies, are essential to create and sustain an innovative environment, aimed at transforming the society-nature relationship and, therefore, prone to changing production practices compatible with the generation of products and jobs that are competitive and sustainable in the market.

**3. The territory and the landscape are key factors in innovation and development.** The rural development dynamics have historically been guided by sectoral logic, supporting production and productive development in general; however, the INNOVA AF Program shows the relevance and structuring value of the territory as a critical element for innovation and development.

Three elements must be highlighted:

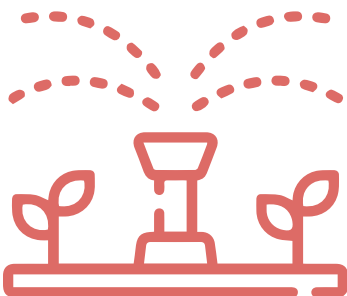
a. looking at the territory makes it possible to integrate the multiple factors that make up rural development. This territorial look allows for overcoming sectoral fragmentation, thus generating better synergies and articulations between the various stakeholders involved.

b. it is again validated that the innovation processes are territorial, since they require anchored stakeholders, and dialogues built in the territory with proximity. This does not prevent the existence of multi-scalar networks that articulate the local with the national and global.

c. finally, thinking of innovation processes as territorial actions make it possible to consider migratory processes, the new relationship between the countryside and the city, and other territorial dynamics that affect these processes of innovation and change.

*Innovation is a virtuous process that depends on the conditions of the territories and rural landscapes.*

**4. The types of innovation should be oriented according to the strategic objectives.** Innovation processes in the face of climate change can be very odd and oriented towards very different sectors or themes, often with a minor impact or little interest in solving the specific problems of the territory.





That is why it is necessary to have a surveillant attitude to guide the innovation processes towards themes or dimensions of local life in which they can have a more relevant impact or that are not detrimental to any member of the family (for example, the role of women in the home, field, and society).

In this sense, and in view of the experiences of the INNOVA AF Program, we consider that the innovation processes aimed at adapting more effectively to climate change should meet the following criteria:

a) any innovation process or new technologies should necessarily be adapted to the realities of family members and their means of production, not only in terms of technological and economic scopes, but also the socio-cultural one.

b) they should aim at transforming the development model and reducing the vulnerability of the territory; that is, it should not remain just a niche activity.

c) they should integrate into production chains in a more competitive manner with fewer intermediaries. This means, that is, to anchor the highest added value in the territory for the generation and diversification of employment for other members of the community.

d) they must appeal to the use of new information and communication technologies, for production, post-harvest, transformation, and marketing (online marketing networks, product-consumer applications, etc.)

e) innovation processes should necessarily incorporate a risk reduction strategy, since innovation can only be sustainable and scale up over time if they effectively contribute to reducing risks, both natural and man-made.

*No puede haber innovación sin que la base se sustente al menos en buenas prácticas ambientales y de producción sostenibles, salarios dignos y relaciones equitativas y justas de los miembros de las cadenas de valor de un producto o servicio que genere un territorio.*



*FF will not be able to adapt to climate change if new innovations, knowledge, and practices are not built.*

**5. The shift in the development paradigm requires the creation of new knowledge and capacities through face-to-face and virtual modalities.**

Effectively adapting to the new conditions imposed by climate change requires building new capacities in the multiple stakeholders. Ultimately, this relates to learning new ways of doing things. Training and continuous learning are basic elements that must be consolidated through different strategies that emphasize the logic of learning by doing, where the practice is articulated in parallel with theory.



In this sense, decentralization and cascade training has been shown to be effective capacity-building strategies. The decentralization of training, in areas closer to the life of the producers, is much more efficient than traditional training in classrooms, outside the areas of practice. Thus, for example, Field Schools are ways of building capacities since they include theoretical-practical training processes and promote collective learning, where farmers lead the process.

Learning by doing activities, workshops, and visits to other farms to exchange experiences reinforce the functional capacities of the participants.

These strategies are linked to cascade training, that is, training to certain local stakeholders who will then be responsible to train the rest of the stakeholders involved (beneficiary-to-beneficiary training). Decentralization and cascade training allow training processes to be anchored to the actual needs of the producers and their living conditions, and for the temporality of the stakeholders and the gradual improvement processes to be respected. Another key lesson from the program is that since capacity development requires time, practice, continuity, and follow-up, the entire capacity-building process should have a continuous follow-up to ensure that the beneficiaries apply the new knowledge. Lastly, the importance of the training virtual modality must be highlighted. The

pandemic affected the entire INNOVA AF process, but distance education used the Internet to make it possible to overcome many of the limitations imposed by the pandemic.

*This project will adopt a farmer-to-farmer outreach approach, where direct beneficiaries, or those who are awarded with technologies and technical assistance, would teach other farmers (indirect beneficiaries) using their own technologies to demonstrate their benefits. The technological innovations are supported by social technologies that will strengthen the organizational capacity to carry out studies, critical analysis of reality, and community work on climate change adaptation.*

*(Edwin Prado, IICA, Brazil)*

**6. Agridigitalization emerges as an ally for change and climate change adaptation.** INNOVA AF has shown that the use of new information technologies by family farming is a fundamental factor to improve production systems in a comprehensive manner; however, to promote their use and better leveraging, it is necessary to substantially strengthen producers and producer associations regarding the use of new technologies in general.

Different sectors such as specialized organizations, private companies, or Academia should be summoned, so that they can contribute to training and adaptation to new technologies.





There are strong cultural, training, and infrastructure barriers that limit the full adoption of these new technologies, which should be worked on. In addition to the above, in-depth analyzes must be carried out on which digital tool and how it can improve income so that it is really a motivating factor rather than a frustration for farmers.

*Well-adapted and properly used information and communication technologies are essential to adapt to climate change, generate benefits, and build a new rural development model.*



**In addition to these general considerations and lessons learned from INNOVA AF, we also think that we must face a series of great challenges** in order to promote change and build a new regime and development model around family farming. These challenges can be posed by big themes.

The INNOVA AF experience made evident that it is necessary to **build spaces for reflection on the future of family farming and how it contributes directly to the processes of climate adaptation and resilience**. The construction of innovation processes and new knowledge is essential to better adapt to the new conditions of climate change; however, these actions should be directed based on an outlook thought of the future.

It is the reflection on the future and the paths to follow that should command and guide the daily actions of climate change adaptation. In short, there is a need for more prospective and shared reflection on the future. It is from a prospective reflection that it will be possible to really map the needs in knowledge management, an essential task when planning new projects and programs.

Secondly, much more work must be done to **anchor and link innovations with public policies and regulatory frameworks**; this is the best mechanism to be able to sustain and scale up innovation processes. Thus, the generated knowledge and methodologies should begin to form part of rural development policies, in the form of protocols or methodological standards. Likewise, in the absence of a regulatory framework, this provides input to start discussing them.

An emerging challenge is that **rethinking technical assistance strategies becomes necessary**, both in their modality and in their intensity, since there are many territories and family farmers that do not have access to technical assistance to help them to develop new practices adapted to climate change. The discussion on technical assistance strategies should also emphasize their modalities and forms, as there is a lot of experience in Latin America on the matter that should be valued through a more powerful and shared reflection.



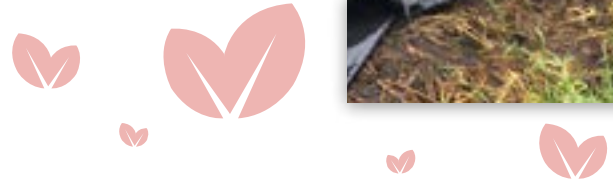
It has been shown through INNOVA AF that, if there is no technical assistance focused on family farming and climate change adaptation, building a greater resilience capacity is difficult.

Experience shows that to build processes of innovation and change, it is necessary to produce, systematize, and assess the data and information linked to the processes of climate change adaptation. All the initiatives launched have worked in this direction, generating very important information and knowledge on climate change adaptation. However, it still cannot be properly valued due to the presence of numerous, and sometimes overlapping, information management and dissemination systems. There are numerous databases, observatories, and information platforms, but this has not favored the ordering and use of information.

**It is necessary to organize and manage the available information and knowledge in a much more effective way.** To this effect, it will be necessary to rethink the architecture and organization of these information centers so that they can collaborate more effectively in the processes of innovation and change.

In terms of governance, experience shows that it is essential to **generate greater commitment**, both among the producers themselves and among the different stakeholders involved at the different scalar levels, building spaces for dialogue at the territorial level, especially with local governments or the forms of government established in the territories. This has been one of the great lessons learned from INNOVA AF; however, the road ahead is very long, since the logic that promotes fragmentation and institutional competition persists in the region, for which the construction of consensus is an arduous but necessary task for scaling up.

In terms of strategic alliances, we believe that it is essential to **involve academia in the processes of innovation and transition** towards new scenarios of sustainable development. Beyond some interventions, academia appears as one of the great absentees in the processes of innovation and change, when, on the contrary, it should be a key stakeholder in the construction of a powerful reflection on the transition. The participation of academia in these processes would open the doors to numerous knowledge management and analysis opportunities, but above all, opportunities to create a new culture around the transition and new capacities in the future to sustain and promote changes, especially by young people.





Last but not least, experience has shown that a process of innovation and change is only possible if there is sufficient capital of public goods in the territory. If structural problems of land ownership, minimal infrastructure, contexts of violence, and unresolved health and education problems persist, the construction of innovation processes for climate change adaptation appears as a chimerical task, or at least extremely difficult. This does not mean that this task should be abandoned, but rather **having clear diagnoses and appropriate strategic planning** becomes more necessary than ever. Solutions to structural problems should be built while ideas and proposals are generated for climate change adaptation, which over the years has also become a structural problem for family farming in Latin America.





## **CONCLUSION**

**Exploring New Paths Around  
Climate Change Adaptation in Family Farming**

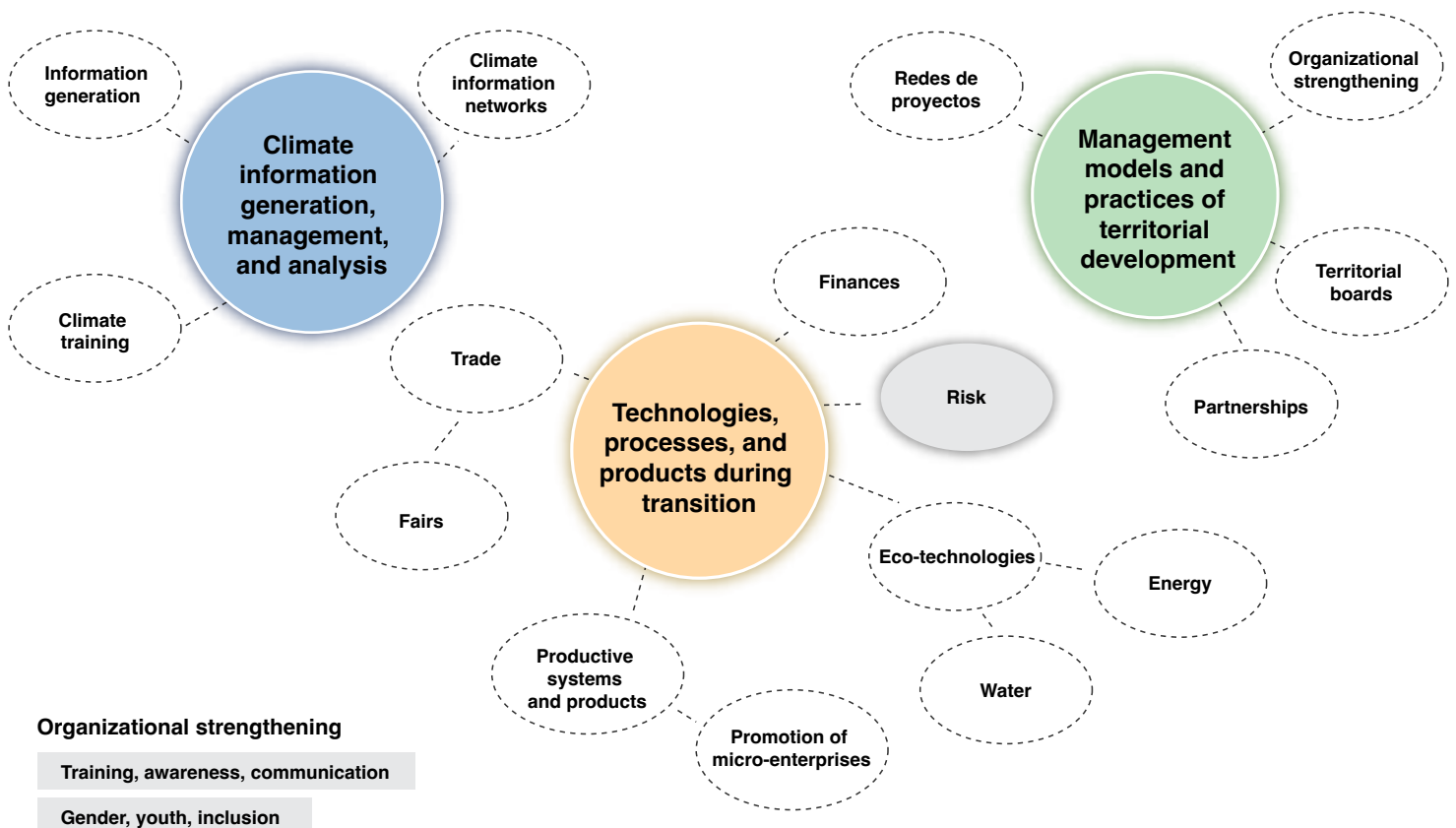


The INNOVA AF program has generated numerous innovation processes with many lessons learned. They are related to the activities to carry out and the processes to promote, with the aim to build a new transition path towards a new model of much more sustainable rural development that is especially articulated to the challenges of climate change. However, in the future all this complexity should be organized to generate more effective and concrete operational processes, thus avoiding waste of time and effort in multiple initiatives with little impact.

As a result of the participatory process generated among the participants of the INNOVA AF program, three major paths or key subjects have been defined, as can be seen in Figure 4. They demonstrate numerous initiatives that either have been developed during INNOVA AF or are in the development phase with a strong potential to be scaled and improved over time, and with sufficient capacity to ensure a transition process towards more resilient and sustainable rural territories. In short, these proposals should be considered as items on a strategic agenda to build the future and to ensure a more effective adaptation to climate change, especially with family farming as a producer of food and environmental benefits for society in general.

All these initiatives are crossed by key subjects such as training, awareness, and communication, in addition to issues related to gender, youth, and inclusion.

**Figure 4: Key Subjects Emerging from the INNOVA AF Program**





The first key subject is the creation and strengthening of models and management practices for territorial development. The INNOVA AF program has been very sound in identifying and generating innovation processes around existing territorial management in the lands, understanding this as a critical factor to build climate-change adaptation processes and transition towards new rural development models. This theme addresses several items such as territorial governance, multi-scalarity of development processes, project networking, and creation of multi-stakeholder boards or platforms for decision-making, among other topics.

The INNOVA AF program has already ventured into these issues and generated numerous contributions, including new methodologies, work groups, inter-institutional articulation, and innovations in territorial governance, among others. Building and stabilizing a cluster of initiatives linked to territorial dynamics would recover and further consolidate the technical teams that have been working on the subject in the region, but that do not have a formal space for articulation and exchange of initiatives and learning. It would also enable the design of new territorial management proposals to collect the consensus and methodological learning as they are generated. In terms of the agenda, several actions should be developed in the future.

In the first place, generating greater dissemination of innovative territorial management experiences is being proposed within the context of the countries of the region, paying special attention to the incorporation of these methodologies in the public policies of territorial management.

Secondly, a methodological document is intended to be generated to support territorial management processes leading to the construction of resilient and sustainable territories. It will integrate multiple documents and methodological guides developed by the INNOVA AF program, to constitute a conceptual and methodological development at the service of the planning and management of rural territories.

Thirdly, and a key element in a future agenda, is the generation of territorial management and development projects in complex rural areas that articulate several countries, including the Amazon, the American Gran Chaco, or bordering areas. Confluence and participation of several neighboring countries or regions are essential because the territorial dynamics require a comprehensive joint outlook. These management projects will use and test all the conceptual and methodological framework that has already been developed and systematized. These experiences will be concrete examples of territorial management in complex scenarios, thus constituting a new lesson on territorial management in Latin America.

A second essential subject is developing new technologies, processes, and products better adapted to climate change conditions. This theme addresses various elements, such as developing new products, production processes, technologies, and trading mechanisms for family farming. The INNOVA AF program has been very prolific on these issues, with innovative processes in all countries, providing new technologies, new trading methods, products, and risk reduction strategies.



To consolidate them and ensure their escalation over time and throughout the region, it will be necessary to work on two significant actions:

- First, the systematization of technologies allows family farming to adapt to the conditions generated by climate change successfully. Multiple technological and product innovations in all countries should be systematized and communicated efficiently to reach a more significant number of people and institutions throughout the region.
- Secondly, a platform should be created to exchange technologies between different institutions and producer organizations, thus leveraging the full potential of the innovations generated.

A third key subject emerging from the INNOVA AF program is the need to **continue working on generating, analyzing, and disseminating climate information** so that producers have better decision-making tools. The program has been very fruitful in developing innovative processes for generating climate information through networks of low-cost weather stations, implementation of nanocomputers, and coordination with weather services, among many other innovations. However, in the future an improvement in these innovation processes is expected to generate more information of a local nature, enhance the quality and analysis of the data, develop greater technical capacities in the producers to analyze and interpret the data, and finally improve communication so that climate information reaches all producers. Faced with these goals, two concrete actions may be carried out. Firstly, to support the initiatives already underway through their institutionalization in the State structures, especially with the meteorological services. Secondly, an exchange of successful experiences between the different countries is intended to be promoted.

These key subjects will ensure the scaling up of innovation and climate-change adaptation processes by family farming in the region, thus contributing to the construction of a transition process from production models that are not very resilient and sustainable to systems that are much more resilient, thus guaranteeing the permanence of family farming and the enrichment of the rural territories of the region.





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