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SEMEAR INTERNACIONAL PROGRAM STAFF

COORDINATION

Fabiana Dumont Viterbo

FINANCIAL ADMINISTRATIVE ASSISTANCE

Ana Luiza Santos

KNOWLEDGE MANAGEMENT ADMINISTRATION

Aline Martins da Silva

SOUTH-SOUTH COOPERATION MANAGEMENT

Ruth Pucheta

M&E MANAGEMENT

Adalto Rafael

COMMUNICATION ADVISORY

Gabriel Monteiro

PUBLICATION STAFF

DRAFTING

Andréa Paula de Carestiato Costa

EDITING AND PROOFREADING

Ruth Pucheta

GRAPHIC PROJECT AND LAYOUT

Sonia Bastos | Estúdio 513.com

IMAGES

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IFAD map in Brazil



PRÓ SEMIÁRIDO PROJECT (PSA)

- Benefited Families: 70,000
- Families Headed by Young People: 20,200
- Families Headed by Women: 40,500
- IFAD Funding: US\$ 45 million
- Government Funding: US\$ 50 million



DOM TÁVORA PROJECT (PDT)

- Benefited Families: 12,000
- Families Headed by Young People: 3,600
- Families Headed by Women: 4,800
- IFAD Funding: US\$ 16 million
- Government Funding: US\$ 12.2 million



VIVA O SEMIÁRIDO PROJECT (PVSA)

- Benefited Families: 22,000
- Families Headed by Young People: 6,600
- Families Headed by Women: 9,500
- IFAD Funding: US\$ 20 million
- Government Funding: US\$ 10.1 million



PROCASE PROJECT (SUSTAINABLE DEVELOPMENT OF CARIRI, SERIDÓ AND CURIMATAÚ)

- Benefited Families: 22,000
- Families Headed by Young People: 1,570
- Families Headed by Women: 10,800
- IFAD Funding: US\$ 25 million
- Government Funding: US\$ 15.5 million



DOM HÉLDER CÂMARA PROJECT 2 (PDHC 2)

- Benefited Families: 74,000
- Families Headed by Young People: 39,000
- Families Headed by Women: 37,000
- IFAD Funding: US\$ 18 million
- Government Funding: US\$ 82 million



PAULO FREIRE PROJECT (PPF)

- Benefited Families: 60,000
- Families Headed by Young People: 16,052
- Families Headed by Women: 10,800
- IFAD Funding: US\$ 40 million
- Government Funding: US\$ 40 million



Exchange of Experiences in the Learning Territory of Piauí. Source: Fabiana Dumont Viterbo.

IFAD's performance in Brazil with the Semear Internacional Program

Ihe International Fund for Agricultural Development (IFAD) is a financial agency of the United Nations (UN) that, in partnership with state and federal governments, enters into loan and grant agreements to support rural development. In Brazil, IFAD's main investment focus is the semi-arid region, where it performs actions aimed at promoting productive projects to generate agricultural income, cooperatives, associations and access to markets. With promotion of nutritional food security and reduction of poverty in rural areas among its pillars, IFAD encourages the strengthening of activities whose priority audiences are women, young people and traditional communities.

IFAD has already provided an amount of approximately US\$ 300 million for the implementation of 13 projects in Brazil. Six projects are in execution in 2020, with direct benefit to 250,000 families. Five of them are in partnership with state governments, through bilateral agreements: Paraíba (Procase Project – Sustainable Development of Cariri, Seridó and Curimataú), Bahia (Pró-Semiárido Project), Sergipe (Dom Távora Project), Piauí (Viva o Semiárido Project), and Ceará (Paulo Freire Project). In partnership with the federal government, the Dom Hélder Câmara Project (PDHC) covers 11 states: Pernambuco, Ceará, Rio Grande do Norte, Alagoas, Bahia, Piauí, Paraíba, Sergipe, Maranhão, Minas Gerais, and Espírito Santo.

In parallel with the projects, IFAD seeks to carry out actions that go beyond productive development in the communities served, encouraging access to information through donation programs, such as the Semear International Programme (PSI), whose operationalization is supported by the Inter-American Institute for Cooperation on Agriculture (IICA). Operating in Brazil, PSI has the following axes: Knowledge Management; Monitoring & Evaluation; Communication; Policy Dialogues; and South-South and Triangular Cooperation. PSI works with the six projects supported by IFAD in Brazil, strengthening their capacities by carrying out activities that stimulate knowledge. The objective is to facilitate access to contextualized knowledge and innovations for coping with the semi-arid region.

Among the PSI's activities, there are exchange programs; training; workshops and seminars with technicians and project beneficiaries; technical training for public managers; institutional articulations; support for gender equality; support for the collection of socioeconomic data and methodization of results; book publications, and production of journalistic and communicational content in print and digital formats. In this way, the program has been making a significant contribution to the systematization and dissemination of good rural practices in IFAD's projects, both nationally and internationally.



Learn more about PSI's actions; visit the virtual library and access the events held to join the network for the dissemination of good rural practices in the semi-arid region, accessing www.portalsemear.org.br.

Operation of each PSI's action component:

Knowledge Management

Training, exchange programs, thematic meetings and seminars are the main activities developed to strengthen knowledge and the knowledge exchange between projects, involving technician and beneficiaries. The most addressed themes are: access to markets, agroecology, gender, gastronomy, and goat farming. Many of these events result in publications that, in print and/or digital format, contribute to the enhancement and increased visibility of these good practices and successful experiences.

Monitoring & Evaluation

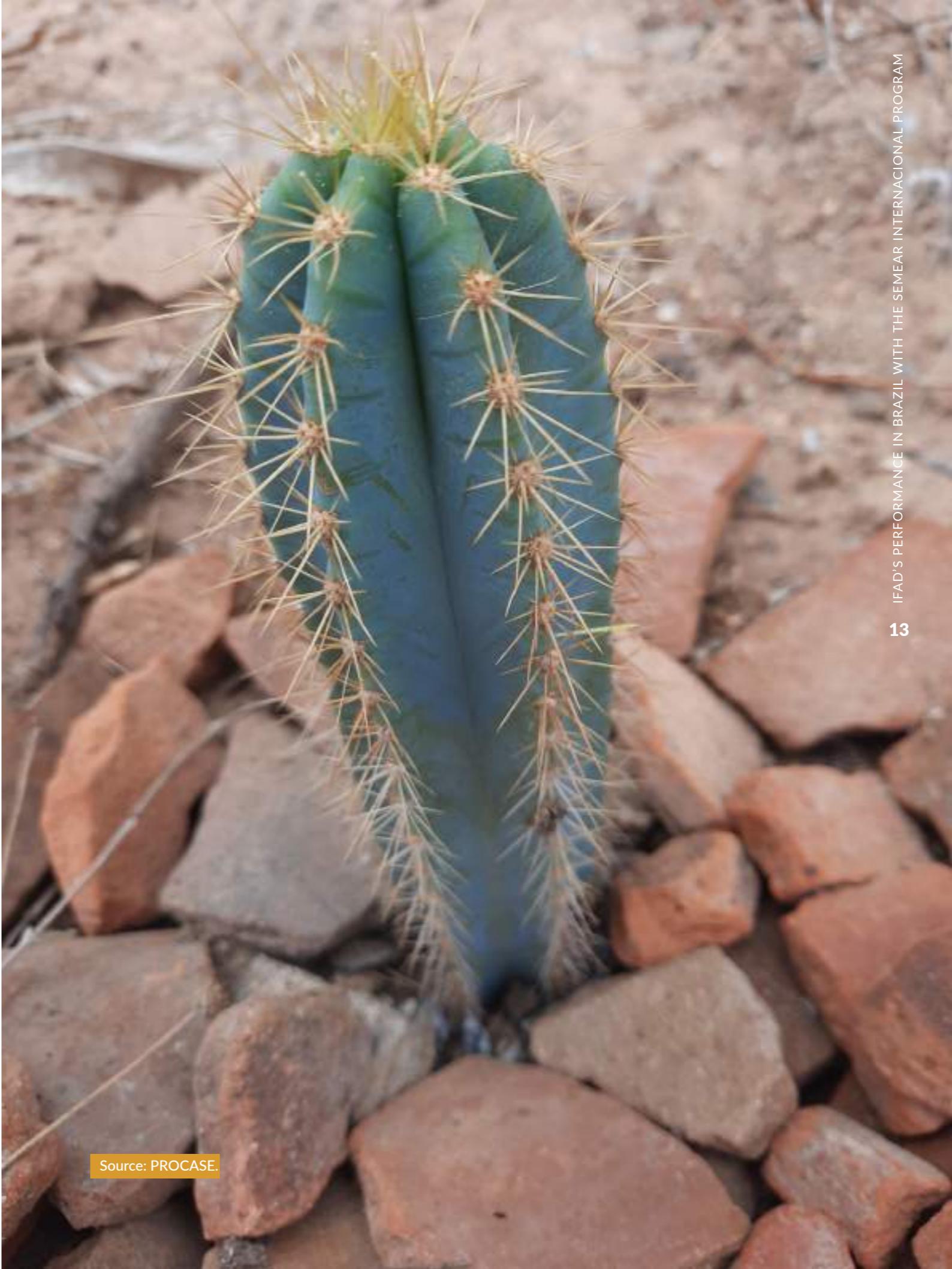
Periodic training courses for technicians from these areas are carried out, with promotion of meetings in working groups and the involvement of professionals from other institutions. All IFAD's projects in Brazil use an integrated management system called Data.Fida, a great product developed by Semear Internacional for this component, which contributes to improving quality and accuracy of the information collected and processed by the projects.

Communication

A component that permeates all others, Semear Internacional's Communication uses several channels, such as the portal and social networks, to make knowledge and information reach the most different audiences. Publications (books, booklets, manuals and studies), a collection of videos and photos and the database of good practices already listed can be found on the website, as well as texts created weekly and disseminated among IFAD's projects. A recent product in this area is the Prêmio Semear Internacional de Jornalismo, award in its first edition that honors the best news reports in Brazil on good rural practices.

South-South and Triangular Cooperation and Policy Dialogues

The objective of South-South and Triangular Cooperation is to foster new knowledge and networks through the internationalization of its actions. Through exchange programs, training and seminars involving countries in Latin America and Africa, topics of common interest in family farming are addressed, identifying techniques and practices that can help rural workers in their daily lives. In addition, PSI seeks to facilitate the dialogue on public policies, with a view to supporting spaces aimed at the debate between civil society, governments, academia, and partners.



Source: PROCASE.

Introduction

The increasing conversion of natural environments into areas occupied by human activities is a global reality. The human presence on the planet has significantly altered the natural environment. Except for glaciers, mankind has already transformed between 40% and 50% of Earth's surface into either agricultural or urban areas. Even indirectly impacted sites are affected by human activity due to the fragmentation of adjacent areas.

This phenomenon has triggered pollution, habitat fragmentation, and species losses on an unprecedented scale. As a result, environmental degradation has become one of the main issues to be faced in the daily lives of people and organizations.

Aware of these challenges, the Semear Internacional Program made efforts to identify and systematize good practices in the area of resilience and coping with climate change among projects financed by the International Fund for Agricultural Development – IFAD. However, to contextualize the experiences which served as the basis for this study, there must be a highlight on the advances and changes in family farmers' reality, activities present in over 900 municipalities where IFAD operates in the semi-arid region of Brazil and other countries in the South-South axis.

Thus, promoting sustainable rural development by supporting Brazil and many other countries in achieving the Sustainable Development Goals (SDGs) of the 2030 Agenda has been IFAD's work in the poorest regions of these countries, prioritizing work with the most vulnerable groups, mainly women, young people, and traditional communities such as quilombolas and native peoples.

For its part, the Inter-American Institute for Cooperation on Agriculture (IICA) has produced messages highlighting the recognition of agriculture as an opportunity-generating activity.

As an example, the sector remains one of the main sources of employment and income for many countries in North, Central, and South America. Such themes have also been the object of the development cooperation offered by the Institute, generating international public goods, and mobilizing technical and financial resources and knowledge to enhance agricultural development and rural well-being.

Both North and South America currently play a crucial role in the production and export of food, which in turn are in high demand around the world.

Given this first institutional arrangement, Semear Internacional is a program of the International Fund for Agricultural Development – IFAD implemented by the Inter-American Institute for Cooperation on Agriculture – IICA.

Semear Internacional "is a knowledge management program in semi-arid areas of Northeastern Brazil, whose objective is to facilitate access to knowledge, innovations, and good practices that can be adopted and replica-

Damming of gullies with stones and branches. Source IRPAAC.



ted by the rural population to improve their living situation and promote the sustainable and equitable development of the region" (Semear Internacional Project, 2021).

As a response to the complex situation of a cultural and environmental wealth of the enormous difficulties in the face of socioeconomic inequalities inserted in a climatically challenging territory, the focus on capacity development and the implementation of innovative experiences and technologies have emerged among rural populations in line with the purpose of surviving within the Semi-arid.

The Semear Internacional Project works as a multidimensional action to find different types of knowledge, working on knowledge management in an integrated manner. Among its three strategic thematic areas are the productive and technological innovations; the rural businesses; and the natural resources and adaptation to climate change, the latter is where this consultancy is inserted with the identification and systematization of its best practices to contribute to the strengthening of collaboration and learning networks between different social actors, favoring dialogue and action, and bridging the gap between scientific knowledge and local knowledge.

This scenario allows for many opportunities that countries may seize to become promoters, as well as users, of agricultural innovation while sustainably intensifying agricultural production, potentializing agricultural activity as a job generator, and contributing to the elimination of the food and nutrition insecurity that affects over half of American countries.

This systematization aims at taking advantage of the opportunities arising from the experiences targeted at the development of rural American territories, focal points for progress, wealth-generating spaces and sources of natural resources, ancestral knowledge, and decent employment to act with the resilience dimensions and adaptation to climate changes, the sustainable prosperity that agriculture can bring into rural territories, and the combat to sources of poverty and social exclusion against gender, young people, native peoples, and quilombolas.

This way, the set of knowledge arising from the four selected experiences should contribute to the definition of guidelines and recommendations to be added to the Semear Internacional Program, IICA, IFAD, and the Projects powered by IFAD through any effects they may promote.

However, we must first find an effectively representative format, validated against the complex institutional chain that precedes and structures them. Carrying out the selection means, for example, leading to its conversion towards the bases of its construction while considering the need to seeking integrated solutions with the optimization of institutional efforts and following the legacies of numerous events and actions that raised the subject of 'Climate Change' to the forefront of global debates in light of the 2030 Agenda, which cross-cuts the challenges related to the 17 Sustainable Development Goals – SDGs and documents released from various social actors.

It starts from the centrality of the 'Climate Change' subject to the regional debate associated with the realities and contexts where topics related to environmental quality, combined with the techniques applied, meet, and become the source of benefits. Those realities and contexts overlap in the exchange of experiences and dialogues seeking potential paths so that sustainable agriculture may consolidate itself as praxis, among other things, of local and regional climate change adaptation actions aimed at inspiring the people.

The initiatives brought up by the four experiences systematized in this work involve the relevance of their proposals to the human populations inhabiting their territories of interest (Caatinga and Dry Forests). It was observed, however, that the basis behind each of the practices was necessarily the environmental recovery, conservation, and protection, regardless of the affirmation that it is mainly focused on climate change or combating desertification, all of which are specialized terms to determine specific phenomena.

Reflections on good practices and systematization

Good Practices are a subject whose interest and impact have intensified in multiple areas of production, from business to government management, the universe of public policies to citizenship and ethics, modest civil society organizations to international bodies.

These are policies and practices that influence various aspects related, for example, to performance statements whose result seeks to add value to activities, expectations of transforming the reality of the challenges of facing climate change both in given territories and across the planet.

Institutions must have their own goals. By using good practices that will – to some extent – create different identities or qualification conditions to value processes, results, and capacity development; the overall goal is achieving visibility, innovation, and recognition.

Good practices can also be the simple expression of established rules, legal and corporate requirements, or a protocol to be followed as a matter of priority.

Through research on various websites, we can apprehend that good practices, generally speaking, do not seem to be a management fad or tool. Also, given the perception of the content proposed by those who use them, they have been considered a structured and irreversible dynamic process. As for the motivators, only institutions can speak for the reasons behind their use of good practices as a governance element.

However, the objective reflection moves towards the possibility of extending its application to the bias emphasized by the Semear Internacional Project in its scope of action; that is, the pedagogical role provided by this proposal.

Another highlight of what the pedagogical role of a good practice can be, the Inter-American Institute for Cooperation on Agriculture (IICA) has promoted the application of good practices and methodologies for the formulation, monitoring, and evaluation of policies, programs, and projects for public management based on evidence and results.

For a long time, IICA has been acting as a regional cooperation node while sharing its wealth of technical knowledge for the development of innovation and extension strategies for public institutions, which includes several training events in the planning, leadership, and work methodologies.

The systematization concept has been coined to designate a methodological means of knowledge elaboration. Thus, beyond data organization, systematization is a set of practices and concepts based on the knowledge of the reality that provides the reflection and re-elaboration of the thought intending to transform the practical lessons carried out for the people bound to become subjects and transform agents of the acquired and/or elaborated knowledge in their localities.

Macambira plant. Source: IRPA.



Together with a better knowledge of the experience, individuals and groups that go through a systematization process are transformed, as well as their practices and value systems.

This would be the moment when analysis and interpretation play a significant role in triggering and guiding those changes, as systematization, among so many definitions, is a methodological stance that contributes to giving meaning to the projects' 'journeys', experiences, and even the ideas experimented.

The results of a systematization may chart the steps past what had been perceived as something or someone's limits until that point in time. Systematization helps us sharpen our senses during the 'journey', shining light on obstructed, hidden, and unexpected paths that could be waiting at a crossroads.

It is a condition of the process, given the understanding that systematizing is still assuming complexity within its unfinished character, as well as a continuous and fearless reflection on opportunities, challenges, and new goals that are, in fact, victories over findings' common places.

Such findings may be magnificent, although often eclipsed by cultures excessively guided by formalisms or manifestations of nuanced realities that go beyond unambitious expectations on whatever is not presented in the foreground of what is usually determined.

In the case of the four experiences proposed by Semear Internacional Project, it was found that they are in line with the challenges of Goal 13 of the Sustainable Development Goals (SDGs). Thus, the experiences contribute to the implementation of urgent measures to strengthen resilience and adaptability to risks arising from climate and natural disasters.

Such actions are urgent and emerging in vulnerable territories as the Brazilian Caatinga and/or Dry Forests of Central America, in which the impacts are more intensely felt because they are focused on the planning and practicing of the present!

This publication also observes the role of society and the issue of governance, adaptation, and anticipation in a context of uncertainty. The experiences that constitute said "good practices" so that the Semear International Project can raise, in the near future, the expanded reflection of the field of knowledge on a topic that calls for growing collaborative action. After all, reducing risks and increasing the capacity of adaptation to the new climate conditions is a common demand for the whole population.

In a broader search, clear definitions of good practices related to international cooperation were also not found within the United Nations. The Food and Agriculture Organization of the United Nations (FAO, 2009, p. 1), for example, defines good practices as "any collection of specific methods to produce results in harmony with the values and proponents of those practices."

However, looking at the various existing definitions, we can infer that there is a "consensus" that the identification and selection of good practices has a basic principle: their usefulness to our daily activities.

Hence, when this statement is transcended to the core of the experiences, that is, this fact may provide an opportunity to guide institutional actions and/or even support the formulation and implementation of public development policies sustainable for farming communities/families while considering the agriculture aimed at a diverse food production.

Identifiable good practices can be the result of knowledge production, socialization, and management processes.

It is worth placing the SDG 13 "Action Against Global Climate Change

– Taking urgent measures to combat climate change and its impacts" as a backdrop for the entire study. This implies the use of the following linked Goals as an operational definition

13.1 Strengthening the resilience and adaptive capacity to climate-related risks and natural disasters in all countries.

13.2 Promoting mechanisms to build up the capacity for climate change-related planning and effective management in least developed countries, including a focus on women, young people, local, and marginalized communities.

13.3 Integrating climate change measures into national policies, strategies, and plans.

13.4 Improving education and increasing human and institutional awareness and capacity on global climate mitigation, adaptation, impact mitigation, and early warning of climate changes (CEBDS, 2021).

An observation to be made is the redundancy implicit associated with the idea of good practices in international cooperation projects, as the very notion of international cooperation has a strong link with good practices, here also rooted in the context of the PSI.

Now, there are the 'good practices' naturally implicit in the processes related to international cooperation and the expectation that such good practices are shared or adopted by all involved. *In other words, conceiving international cooperation as a synonym of good practices leads to the finding that we cannot identify good practices with greater clarity and consistency!*

Systematization methodology

 The systematization is not disconnected from the act that leads to it, learning from experience, but is the unleashing of acts of an eminently reflective character. All practices, whether themselves or someone else's, bring their own experience and vision of the world in their wake, which are placed as objects of rescue and reflection.

Thus, based on the encounter of appropriations of knowledge, we can observe the possibility of unraveling and becoming open beyond the misunderstandings, inaccuracies, weaknesses, and contradictions, alongside that which we consider positive actions and achieved successes.

Moreover, if the systematization is aimed at learning from experience and improving them, the process also presupposes changes.

Therefore, to systematize the four experiences on screen was to put oneself in a situation of learning in face of the action; it is predisposing to circulating the limits of the new and the already lived, both consciously and unconsciously.

That said, the methodology systematized possible "good practices" experiences, with the mobilization and identification of the experiences carried out or supported by the Sustainable Development Projects of Cariri, Seridó, and Curimataú – PROCASE (two experiences), the Pro-Semiárido Project, and the Project for Competitiveness and Sustainable Development in the South-Western Border Region – PRO-LENCA.

The methodology for the systematization of "good practices" reinforced four basic goals:

1. The mobilization and identification of experiences under the Sustainable Development Projects of Cariri, Seridó, and Curimataú (PROCASE) and Pró-Semiárido, in Brazil, and the Project for Competitiveness and Sustainable Development in the South-Western Border Region (PRO-LENCA), in Honduras.
2. The criticism, adjustment, and, if necessary, improvement of the concept and parameters for the definition of the protocol applied from national and international literature, developing models for document analysis.
3. The analysis of the documents produced by the experiences, with meetings, semi-structured interviews, application of a basic questionnaire, and an evaluation agreed with partners.
4. A qualitative and quantitative comparison of the ranking was carried out to support the definition of indicators for what should be deemed good practices, from the assessment of its scope and importance to the perspective of substantiating its implementation across other countries and/or regions. This study did not focus on the differentiation between practices.

The experiences were analyzed separately in terms of their actions/decisions in the context of their local realities.

From the standpoint of the composition of the territorial scenarios surrounding the experiences, three of them took place in the Caatinga biome in Brazil, and one in the scope of the Dry Forests of Central America, in Honduras. The systematizations will have complementary pictures for the characterizations of each ecoregion.

The tables help to clarify common aspects and contexts, albeit regarding different experiences. The objective is to consider this factor as an element of identity, which eventually promotes the replicability and optimization of investments, and sharing of technical accumulations eventually be applied.

The perspective of the experiential testimony of those who carry out or receive an experience is also added to the content, as well as how it impacts thoughts, feelings, and actions in the reality of applying what they learned, gained, or lost with it.

Criteria or parameters for experience analysis

We analyzed the ways of carrying out and the results of good practices within the scope of combating climate change in projects supported by IFAD in Latin America using general and specific criteria.

General criteria of an eliminatory nature are those aimed at assessing the framework of the action that expresses the following concept of 'Good Practices': "A 'good practice' is not only good in itself, but a practice that has been proven to work well and produce beneficial results and is, therefore, recommended as a model. In a broad sense, it is a successful experience, both tested and validated, that has been repeated and deserves to be shared and adopted by as many people as possible."

GENERAL CRITERIA

- a. The framing of the practice under the scope of confronting climate change.
- b. The framing of the practice within the implementation time, preferably with a minimum of 2 years of execution, considering the time needed for the gathering of all other parameters described by the consultancy analysis while ensuring its genuine integration with the local reality.

SPECIFIC CRITERIA

The specific criteria are eliminatory and qualifying, aimed at assessing the quality of practice within the combat of climate change for the purpose of scoring and final classification of the proposals.

Only practices that met both general criteria provided had their specific criteria scored.

There are eight specific criteria:

1. Effective and successful: a “good practice” has demonstrated its strategic relevance as the most effective means of achieving a specific objective, been successfully adopted, and had a positive impact on individuals and/or communities.
2. Technically possible: technical feasibility is the basis of “good practice”, meaning it is easy to learn and apply.
3. It is the result of a participatory process: participatory approaches are essential because they generate a sense of belonging towards decisions and actions.
4. Replicable and adaptable: a “good practice” must have the potential for repetition and, therefore, be adaptable to similar goals in various situations or contexts.
5. Reduces disaster/crisis risks: a “good practice” contributes to disaster/crisis risk reduction and, therefore, strengthens the communities’ resilience.
6. Permeated by gender and youth issues: prioritizing practices developed by young people and women from the semi-arid regions involved, and/or present sensitive analyzes to gender and youth issues, demonstrating how the actors – within their specificities – were able to improve their livelihoods.
7. Sociobiodiverse: expresses the interrelationship between biological diversity and sociocultural systems. In other words, they are the means of dynamic biodiversity management, production, reproduction, and conservation by communities, while respecting the environment and integrating local processes, practices, techniques, and knowledge that result in different and/or adapted ways of cultivation and collection.
8. Agrobiodiverse: includes all biodiversity components relevant to agriculture and food, and formative of agricultural systems; the variety and variability of animals, plants, and microorganisms, at the genetic, class of species, and ecosystems levels, and their interactions, necessary for the sustainability of the key functions of agricultural systems, their structures, and processes. It reflects the dynamic and complex relationships between human societies, cultivated plants, and the environments they inhabit, reflecting on policies for the conservation of cultivated ecosystems, promotion of food and nutritional security for human populations, social inclusion, and sustainable local development.

Indicators

Assessment is an essential management activity for the implementation of good practices. This has become evident for institutions that adopt this sort of device in which the measurement of results is an essential part of expectations regarding the context of good practices.

However, there seems to be a widespread perception that, once the concept to be applied to the activity is defined, a set of parameters is integrated into it and ends up acting as indicators or, at least, tend to do so.

In the present study, it is considered that some of the characteristics of the experiences to be selected will effectively provide conditions to identify effective indicators given their highly outstanding specificities.

One of the characteristics strongly outlining the practices of IFAD Projects is their need to observe environmental and resilience aspects, particularly regarding climate change, an explicit inclusive dimension in the multi-dimensional concept of quality of life. The conceptual evolution of climate change involves at least two broad categories of analysis: mitigation and adaptation.

Hence, we can already determine that experiences tend to turn into good practices, as they contribute to this assumption.

Another possibility is imagining the environmental merit, that two or more indicators can be associated to generate understanding if the experience's proposal reaches a different level of quality and results by bringing, simultaneously and in balance, an admittedly interesting contribution to the community and thus, generating the “will” to adhere to the proposal in their beneficiaries, with effective implementation of their economic, technological, or social activity.

Thus, the experience contributing to at least one of the climate change effect categories, which is a benefit of recognized interest and voluntarily awakens the “will” to carry it out, can be quite robust for the qualification and quantification of the intensity of a given good practice.

With this, it is possible to promote a consensus on the taxonomy of climate change as an aspect of environmental security that evolves its definition to the ‘reduction of environmental risk or environmental damage associated with the emission of greenhouse gases to an acceptable minimum’.

Different from the traditional dimensions of quality, centered on making the right and timely decisions to achieve agricultural production results and high income, environmental safety is primarily focused on reducing greenhouse gas-emitting events, but also errors, negligence, failure, and omission within the production process that might have not, but could have caused damage.

Systematized good practices

Through the actions and products generated, the systematization process is also related to the possibility of welcoming the perceptions of those who, a year and a half into the pandemic, involved very particular efforts to overcome the impossibility of relying on the different social actors involved in the initiatives to participate in all stages of this study, for example.

Fundamentally, the focal points contributed their living testimony, diverse materials, and an invaluable sense of cooperation in finding solutions to answer the practice documentation questionnaire. It is important to recognize and emphasize that they became co-responsible for the results obtained.

Most of the focal points effectively participated in the systematization by bringing a dialogued interaction between public institutions, civil society, and the private sector into the consultancy for the planning, implementation, and collective follow-up of the experiences.

In this context, the meaning of 'Systematization' can be perceived much more reliably as an action to reveal the system embedded in institutional practices or groups of people carrying out the initiative.

It was the role of the focal points to create the ideal conditions so that the set of ideas, concepts, values, and feelings inherent to each work could be manifested to any possible extent, with the gain of vivid expression, making way for the systematized initiative in their opportunities, desires, hopes, limits, and contradictions.

For the four experiences, this means having each one, in its own way, submerged in the dimension of ideological investigation on the beliefs and values that guide and validate each action, in its form and content, together with the social actors who inspired any of its results.

Hence, we assume that each one of them is a collective and participative work in itself, open to differences and nuances where the institution allowed for frontal confrontation, with its potentials and limitations.

This set should, therefore, constitute a continuous process established based on its own transformations, spreading far beyond its presumed goals and results.

The following experiences were systematized and categorized as good practices in the combat of climate change:

1. Recaatingamento – Bahia, Brazil.
2. Zárate Blanco, Ciprés y Los Puentes Multiservice and Irrigation Systems Company – Honduras.
3. Agroforestry Systems – Paraíba, Brazil.
- An experience of PROCASE ranked as a potential good practice was also systematized:
4. Vivarium – Paraíba, Brazil.

Ecoregions

Here is more information of an ecological-territorial nature on the ecoregions where the four experiences are located, allowing us to broaden the understanding of the extent of their importance within the scope of their respective project's source to provide complementary content to enrich, expand, structure, and improve the composition of the systematization.

An Ecoregion is an ecologically and geographically defined area housing a set of natural communities sharing environmental conditions necessary to maintain their long-term viability.

Although recognized as a single ecoregion by the World Bank and WWF study of Latin America and the Caribbean (Dinerstein et al., 1995; Olson et al., 2001), Caatinga's complex mosaic of soil types and a wide variety of ecological systems indicate that it is, in fact, a biome, being labeled as such by PROBIO.

A good indication that Caatinga should be subdivided into ecoregions is EMBRAPA's Northeast Agroecological Zoning – NAZ, which recognizes 25 distinct landscape units across the Brazilian Northeast, most of which are within the Caatinga biome.

For didactic purposes only, since this key concept has an important consideration to be addressed later on this topic, for now, let us assume that Caatinga and the Dry Forest are both ecoregions.

FIGURE 1. DISTRIBUTION OF SEASONALLY TROPICAL DRY FORESTS AND SHRUBS (FATSS) IN THE NEOTROPICAL REGION, GROUPED ACCORDING TO FLORISTIC SIMILARITY.



Source: Moabe & Queiroz, 2018.

Caatinga is unique!

Caatinga exists exclusively within the Brazilian territory, being the predominating vegetation in the Brazilian Northeast and inserted in the context of the semi-arid climate.

The natives, first inhabitants of the region, called it that because most plants lose their leaves in the dry season and the clear and whitish appearance of the tree trunks prevails in the landscape. Hence the name Caatinga (caa: woods, and tinga: white), meaning "white forest or white woods" in Tupi. However, during the rainy season, the landscape changes from whitish hues into various shades of green.

There are other semi-arid regions in the world, such as Chile's, Asia's, and Africa's, which share similar characteristics of a semi-arid climate and irregular rainfall. However, when scientists compared the species in the Brazilian Caatinga with the ones inhabiting those other regions, they found that our species were not only different and unique but also had a much greater diversity. The precise events related to climate variations (going from very hot into very cold) that took place in the area thousands of years ago made life settle differently and peculiarly in this region.

The varieties of rocks caused different soils to be formed in the Caatinga (with different minerals, depths, textures, as well as a greater or lesser capacity to retain water). The region's climate, with long dry periods, allowed only plants highly adapted to withstand water deficiency to thrive. The contact with different neighboring formations, such as the Cerrado and the Amazon and Atlantic forests, contributed to the formation of a scenario with such specific conditions, where endemic species could emerge.

It covers 11% of the national territory, an area of approximately 326 mi² (IBGE, 2004), with all of its limits within Brazilian territory, that is, its biological heritage is not found in any other region in the world.

It presents a semi-arid climate and sparsely leafed vegetation, adapted to periods of drought, as well as great biodiversity.

It borders the Amazon, the Atlantic Forest, and the Cerrado. Caatinga embraces the entire state of Ceará and part of the territory of the states of Alagoas, Bahia, Maranhão, Minas Gerais, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe.

The semi-arid climate is predominant. It is an important feature that determines the nature of the Caatinga. The semi-arid climate has an average annual rainfall (amount of rain) of around 800 mm. It can reach 1,000 mm per year during rainy seasons, and a mere 200 mm per year during drier seasons. The average annual temperature ranges from 77 °F to 86 °F and is more or less constant throughout the region. The rainfall system splits the year into two seasons – rainy and dry.

The rainy season is short, lasting 3 to 5 months, usually from January to May. Rains are torrential and irregular, concentrated in the first months of the year. The dry season (or drought) then occurs for most of the year,

lasting 7 to 9 months between June and December. The semi-arid is one of the hottest dry regions on the planet. During the dry season, the soil temperature can reach 140 °F, with the blazing sun accelerating the evaporation of water from lakes and rivers.

Most rivers in the Caatinga region are intermittent, that is, they run only during the rainy season and dry out during the dry season. Perennial rivers, those that keep running throughout the year, are less frequent. Two large and well-known perennial rivers in the area are São Francisco River and Paráíba. In the formation of the rivers, the rain clouds coming from the coast are blocked by the mountains and the higher plateaus. There, the rainwater infiltrates and drains, originating hillside springs and humid mountain feet.

The main characteristics of the Caatinga vegetation are shallow and rocky soil, low trees, twisted trunks, full of thorns and leaves that fall during the dry season (except for some species, such as the juazeiro).

The ecosystems of the Caatinga biome are significantly altered, with the replacement of native plant species by crops and pastures. Deforestation and fires are still common practices in land preparation for agriculture, which, in addition to destroying the vegetation cover, harm the maintenance of wildlife populations, water quality, and the balance of climate and soil.

According to IBGE, 27 million people currently live within the polygon of droughts. Wood extraction, the monoculture of sugarcane, and livestock farming on large properties (estates) gave rise to economic exploitation. Rainfed agriculture, a technique for cultivation in extremely dry lands, is still practiced in the Caatinga.

The environmental agencies of the federal sector estimate that over 46% of the Caatinga area has been deforested, leading to it being threatened with extinction. It is noteworthy that many species are endemic to this biome, that is, they only occur there.

The study of erosion in semi-arid regions, especially when the soil and vegetation become vulnerable as a result of human activities, without the conservation of the exploited environment, indicates that, in addition to the natural erosive process, the eroded environment can also suffer a process of desertification.

Tropical dry forest

LOCATION AND GENERAL DESCRIPTION

Until the mid-twentieth century, the tropical dry forest ecoregion of Central America extended in a continuous stripe from southwestern Mexico's Pacific coast (south of Chiapas), across Guatemala, El Salvador, Honduras, and Nicaragua up to the northwest of Costa Rica.

Dry forests previously formed a continuous band in lowland and mountain foothill areas of 0-2625 ft high along the Pacific coast of Central America, south from Chiapas up to Guanacaste. There are also several dry forest patches from this ecoregion scattered in low-lying areas removed from the coast and even relatively large patches in inland lowland areas near the Caribbean Sea in Honduras.

Dry forests can also be found at higher altitudes in the area of the Pacific Rim, along its mountain system of up to 6562 ft. The fact that this ecoregion extends along a large stretch of the Pacific coast of Central America indicates an important confluence of flora and fauna from similar ecoregions in North and South America.

The region's climate is predominantly tropical, with a prolonged dry season of 5 to 8 months, average annual rainfall between 1,000 and 2,000 mm, and a generally bimodal rainfall pattern, with a shorter and longer dry season.

The prevailing winds in the ecoregion blow from northeast/east to southwest/south, while most of the mountain systems in the area run from northwest to southeast, therefore, the Pacific side of Central America contemplates less rainfall than the Caribbean side. Dry forests can be found on a wide variety of soils (Bullock et al. 1995).

BIODIVERSITY CHARACTERISTICS

The dry forest on the Pacific coast of Central America is an ecoregion of biological interest because it mixes elements from North and South America. The ecoregion also boasts a large percentage of endemic flora and fauna. At least 50 plant species, such as *Myrospermum* sp, are endemic to the region (Bullock 1995).

Found in the northern areas of Guanacaste Province, *Rehdera* is endemic to Costa Rica (Gentry 1995). Many plant species have evolved to survive in these forests. During the dry season, for example, many species lose their leaves and fruit, which allows them to limit evapotranspiration.

There are also numerous examples of the adaptation of succulent sclerophyllous species with photosynthetic stems or barks, short, synchronized flowering periods, and large, deep roots. This ecosystem has been closely associated with the human species for at least 11,000 years (Bullock 1995).

As a result, it has suffered from human disruption for a considerable time. It has some vegetation in semi-arid areas and lands with special geological conditions and, therefore, endemic vegetation can be found, such as high-density stands of *Quercus oleoides* and *Crescentia alata*.

Although it is a seasonal environment, some fungi have adapted to dryness and high temperatures. New records of bryophytes and pteridophytes have emerged in Costa Rica. There are still entire groups of plants and fungi that remain unknown within the biological environment (WWF et al. 1999).

Considered an area of interest in Central America by Harcourt et al. (1996) due to its avifauna endemism, it also comprises part of the humid forests of the Pacific adjacent to the dry forests outside the ecoregion.

According to Stattersfield et al. (1998), this ecoregion falls within the endemic avifauna area of the Pacific slope of North America, including four species of restricted distribution, three of which are endemic, including the white-bellied chachalaca (*Ortalis leucogastra*), the blue-tailed hummingbird (*Amazilia cyanura*), and the giant wren (*Campylorhynchus chiapensis*). The Pacific parakeet (*Aratinga strenua*) although not endemic, uses this ecoregion as part of its restricted distribution (Stattersfield 1998).

A large number of mammals inhabit these forests, including endangered species of spider monkeys (*Ateles geoffroyi*) that use river corridors through the dry forest (CITES Appendix I), as well as several cats such as *Felis onca*, *F. concolor*, *F. pardalis*, *F. wiedi*, and *F. yaguaroundi*, tapir (*Tapirus bairdii*), anteaters (*Tamandua mexicana*), as well as many others. The aquatic fauna of the Pacific coast is also worth mentioning. Depending on the area, it is home to up to five different species of sea turtles, numerous fish, amphibians, and endangered reptiles.

CURRENT SITUATION

Dry forests are very deteriorated in Honduras. Migratory agriculture is the main reason for it. With the country's populational explosion, there should be further reductions in the few remaining areas of dry forest habitats in the future. Indiscriminate hunting and fishing, as well as wildlife trafficking, also threaten the ecoregion.

None of the small fragments of existing dry forest are found within protected areas (Carrillo et al. 1994; WWF et al. 1999). The coastal area of the Pacific in Nicaragua is the most populous region, with the greatest infrastructure and urban development. Furthermore, in the last 40 years, large areas have been dedicated to the cultivation of cotton, sugarcane, or bananas and, to a lesser extent, coffee.

Most watersheds are contaminated and experience frequent droughts. Deforestation arises from the conversion of forest areas into extensive livestock and migratory agriculture. Forests are also cleared for the production

of firewood, representing nearly 50% of all energy sources in the country (Carrillo et al. 1994).

However, some dry forest remnants remain at altitudes below 1640 ft, with an average annual rainfall of less than 1,500 mm. Some of the characteristic species in those areas are boxwood (*Phyllostylon brasiliensis*), *Lignum vitae*, *Guaiacum sanctum*, and *Haematoxylum brasiletto*.

Costa Rica implemented the most conservation strategies for this eco-region, although very little of the original habitat is protected. The forest is mainly affected by hardwood extraction and extensive agricultural activities (WWF et al. 1999).

The highest priority in the ecoregion is the need for rehabilitation, formulation of management strategies including fire control and prevention, and the unrestricted protection of its last remaining fragments, however small. If an action plan is not established according to the socioeconomic and political structures of each country, dry forests can be completely obliterated in a short time, leaving nothing but small remnants (Bullock et al. 1995). The action plan must not only conserve but also work on restoring contiguous areas in the ecoregion.

THREAT TYPES AND SEVERITY

Threats to this highly decimated ecoregion vary by country. In Guatemala, inadequate economic structures, a large poor population with basic needs, the expansion of the agricultural frontier, and many other factors affect the amount and rate of habitat destruction (Carrillo et al. 1994).

In El Salvador, dry forest conservation has been difficult given a lack of sectoral planning, organization, institutional coordination, policies, legislation, and government financial power. The country's natural resources and wildlife are highly threatened.

The crimes of usurpation and usufruct of state areas threaten the existence of natural areas (Carrillo et al. 1994; WWF et al. 1999). Regardless of how abundant the country's flora and fauna are, the only remaining dry forest area is Deininger National Park, covering 2,82 mi² (Janzen 1986; Sabogal 1992; WWF et al. 1999).

- Ecoregion design justification

The outline for Central American dry forests was derived from a variety of maps and other sources, and the final line was the result of combining this data with expert opinion in a series of workshops.

The line of work for Costa Rica follows the Holdridge system (Tosi 1969) and derives from the clustering of dry tropical forest and the transition from dry tropical forest to wetlands.

The outline for Nicaragua's dry forests is derived from national vegetation and cover maps (National Physical Resources Inventory, 1966; Nicaraguan Institute of the Environment and Natural Resources (IRENA), 1992).

The Holdridge zones (1962) were used again in Honduras, and the line work was achieved through the agglomeration of lowland dry forest, lowland arid forest, and mountain foothill dry forest.

The map of the National Geographic Institute "Ingeniero Pablo Arnoldo Guzmán" (1987) was used in El Salvador, and expert opinion helped to define the outline.

Junio (1982) was used for line work and expert opinion was consulted for the final product in Guatemala. Some assumptions in the mapping of historic ranges in areas where the original habitat was long-degraded were based on climate and elevation.

Linework in Mexico was based on Flores et al. (1971) and modified by expert opinion from various workshops (CONABIO 1996 and 1997, INEGI 1996). The rationale for the ecoregion is based on endemic bird areas (Stattersfield et al 1998) and the floristic and faunal distribution limits for species, associations, and "dry forest" processes.

Text: Sandra Andraka (WWF Central America)

Revision: Dr. Manuel Guariguata (CATIE)

An environment is considered degraded when it suffers disturbances that disrupt its ability to return to its original balance. This situation is a threat to human survival, as well as the survival of other species living in nature. Therefore, ecological restoration arises as a way out of the collapse of ecosystems across the planet.

Although the practices linked to the restoration of environments and landscapes date from a very long time, Ecological Restoration only started developing as a science in the 1980s. The incorporation of Ecology concepts in environmental recovery projects allowed for the development of models and techniques targeted at areas at different levels of degradation.

This is the situation involving the IFAD Projects in Brazil and the necessary advances in terms of the necessary connection of these subjects. There is a need to amass references for ecological restoration. The diversity of landscapes and species found in Brazil represents great wealth. However, it is also a challenge when it comes to thinking about the task of carrying out ecological restoration.

Scientific knowledge about the ecosystems' composition, structure, and dynamics is decisive to support the success of ecological restoration ahead of the Projects.

There is the need to create a theoretical and conceptual framework, as well as tried-and-true practices for different biomes. Several initiatives of NGOs, companies, landowners and government agencies are aimed at ecological restoration; however, they carry different concepts and values.

In Brazil, the notion of ecological restoration, in some cases, boils down to planting more trees, often of exotic species. This need becomes even stronger due to environmental legislation requirements. The main legal framework focused on the mandatory nature of ecological restoration is the Forest Code. The new text, approved in 2012, calls for the restoration of degraded Areas of Permanent Preservation (APP) and Legal Reserves, leading to the need to establish clear rules for ecological restoration.

Through systematization, we observed that objective information, for example, which are the species used in the reports of Nurseries, AFS, and *Recaatingamento* is not clarified in main reports. In the case of these experiences, the goal is to analyze the opportunities and challenges in the implementation of the restoration chain in the strict context of what has been identified as a gap. It seeks to provide elements for the dissemination of various restoration techniques and their applicability within the different ecological, economic, and social contexts dealt with in the experiments.

Production plot of farmer Concepción Martínez, Yarula Community - La Paz, Honduras. Source: iDE.





Umbu harvest. Source: IRPA

The Pró-Semiárido

Pró-Semiárido (Pro-semi-arid) is the result of a partnership between the Government of Bahia, through the State Secretariat for Rural Development of Bahia (SDR), and the International Fund for Agricultural Development (FIDA), carried out by the Regional Development and Action Company (CAR).

It is a rural development project spread across 460 communities selected based on the degree of poverty and family farmers' concentration. In those identified with the highest level of scarcity of goods and products, the participation of the entire community is encouraged to indicate opportunities for productive development and define future actions.

Between 2014 and 2020, the Government of Bahia invested a total of R\$330 million to strengthen thousands of families living in the semi-arid region, generating income, and increasing production through services and direct investments for the population.

At first, the project is developed together with associations of producers and cooperatives that already exist and have the potential to consolidate and contribute to the generation of income for their members. However, it is expected that, as the project progresses, other organizations of the same kind will emerge and be supported.

Its objective is to build more opportunities for rural populations with low Human Development Indices (HDI), based on the community's growth potential, and always from a perspective of productive inclusion. From the application of various public policies to support family farming, Pró-Semiárido seeks to value and improve the sustainable use of existing resources – land, biodiversity, labor – to expand the productive capacity of the family units served.

It also aims to encourage the creation of new sources of income within the scope of the improvement and processing of agricultural production and other economic activities. Finally, the project should give greater impetus to the access of the population served to different markets, thus, strengthening commercialization within the communities.

Pró-Semiárido works with a participatory approach, allowing – within the framework of the priorities and general guidelines defined for the project – that the demand of the beneficiary public is the main source of direction for its activities.





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**EDILSON
NEPOMUCENO DA
SILVA, RESIDENT
OF THE SERRINHA
DAS IMAGENS
COMMUNITY, BEM
BOM DISTRICT, CASA
NOVA MUNICIPALITY,
BA**

"I didn't know Recaatingamento was a thing. There is no young caatinga as the animals eat the young shoots. The greatest joy was when the community got together to try and rescue the environment, and even our conscience. The meeting of neighboring communities was very important, we also brought together children, young and old. We promoted the local tourism with the community, everyone got their hands dirty, we took beautiful pictures in Serrinha das Imagens.

We are bringing back our history, our culture, recovering the knowledge that was forgotten by time and people who were leaving our community to live in the city."

01

Its methodological guide for participatory planning places great emphasis on the definition and implementation of the Development and Investment Plan, which facilitates the organization of work while favoring the monitoring and evaluation of its progress. This plan is the main instrument for building synergy between the project's components and other programs or initiatives to enable its activities expansion. The work has also an intrinsic pedagogical nature, leading to the conclusion that Pró-Semiárido's set of actions has an educational character.

Within the institutional structure that carrying out the so-called Recaatingamento, its executive branch manifests through the Regional Institute for Small-scale Agriculture from Appropriation – IRPAA, a non-governmental, non-profit organization, headquartered in Juazeiro – Bahia, in the heart of the Brazilian semi-arid, working for over 25 years to promote the Coexistence with the Semi-arid.

IRPAA works to set forth the economic and social viability of the region and offering practical and theoretical subsidies so that a stable productive life can be developed there, despite the climatic variations that occur in the Semi-arid region throughout the year.

Thus, there is an effort to consolidate in practice the meaning of Coexisting with the Semi-arid. It promotes the full development of families in the region through the interrelation of traditional popular knowledge and technical-scientific knowledge for the recovery of areas in the process of degradation and conservation of the Caatinga.

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Observing the development of the planted umbuzeiro. Source: IRPAA.



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02

EDILSON NEPOMUCENO DA SILVA, RESIDENT OF THE SERRINHA DAS IMAGENS COMMUNITY, BEM BOM DISTRICT, CASA NOVA MUNICIPALITY, BA



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Training course on soil conservation. Source: IRPA.

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Conserving the caatinga demands the application of methods contextualized with the edaphoclimatic and social reality of the semi-arid for soil recovery and protection; water storage and use; induction of the emergence of pioneer plants with the addition of mixes of seeds from native plants, mainly herbaceous; isolation of the area from domestic animals; elaboration of a management plan with an eye on the support capacity for grazing and extractivism in the areas to be preserved. It is the appreciation of a strong Caatinga, recognizing traditional peoples and communities as guardians of the Caatinga and its biodiversity.

Across its history, the proposal starts with seven communities in October 2009, with its activities sponsored by the Petrobras Environmental Program until February 2012, when they were supported by the Technical Assistance and Rural Extension of the State and Federal Governments – TARE projects, the International cooperation, and the Catholic entity MISEREOR.

The Recaatingamento Project in Agro-pastoral and Extractive Communities begins with familial communities from the Semi-arid (the so-called Fundo de Pasto) of the municipalities of Juazeiro, Sobradinho, Sento Sé, Uauá, Curaçá, Canudos, and Casa Nova, in the São Francisco Outback Territory in Bahia. After achieving its first results, the proposal was expanded to the municipalities of Remanso, Pilão Arcado, and Campo Alegre de Lourdes, in the same region, currently comprising 12 areas and a total of 895,5 hectares of isolated area.

The table lists information on the historical origin of the concept of Fundo de Pasto, fundamental to understanding the regional context and the identity of the beneficiary audience that this experience reaches with great expertise.

"Thanks to Recaatingamento with PRÓ-SEMIÁRIDO, we gave the squatters a big push. We had this issue with those land grabbers trying to deforest to take out wood. They were not only stealing wood, but they were also stealing our culture, our way of life. The women are overjoyed with the planting of vegetables, they dream of a fair, they want to work hard and prove that we from Fundão (Fundo de Pasto) are also capable and can be seen; we want to be recognized as small producers. Maybe small is just a way of saying it; we're giants, we just haven't figured out our size yet."

Fundo de Pasto's historical concept

The first consideration to be made is that the name Fundo de Pasto was not given by the residents of those communities, although it is currently used as an identification/identity element, yet under construction. According to Paulo Ehle, this term comes from the technicians:

It is recent. It was not born from the people, although it is currently more naturally used by the peoples in certain regions. The term was first used from technicians' observations on this livelihood system. But why Fundo de Pasto? Because families tend to live together in our backlands. Members of the same family will build their homes close to each other. It can be a cluster of three, four houses, or even a small village on the spot. The lands behind the houses, those more distant, independent lands, are the lands of pasture and employment. Hence the term Fundo (back, behind), and, thus, the terminology Fundo de Pasto, which means 'Behind the pastures. Behind the houses, past the areas inhabited by the people and their crops, there is a free area for the pastures, the ones in the back. (EHLE, Paulo. GeografAR Database. Interview, Salvador, 2004).

In the field, we found that the previous term used was 'terra solta,' meaning 'independent land'. Two elements are of fundamental importance for the understanding of the issue: the spatial form of the phenomenon studied and the historical processes they have gone and are still going through. However, there is no form without content, and this content is directly related to the functions previously and currently assigned to the forms. On the other hand, the functions originate from the social organization, which in turn, is structurally defined.

Thus, it is understood that the path that led these communities to shift from 'terra solta' to 'Fundo de Pasto' was a historical process that goes back to the colonial period and gained visibility from the conflicted relationship generated by the land-grabbing process.

During the Brazilian colonization, the Portuguese Crown fragmented the area to be conquered into 12 linear plots of about 30 to 100 leagues, going from the Brazilian coast to the line of the Treaty of Tordesillas called Hereditary Captaincies. Behind the Crown's action was the law of the sixths, commonly known as the Sesmarias Law.

With the failure of the Hereditary Captaincies system, the General Government was installed in 1548. In Bahia, the coastal lands were exclusively reserved for the cultivation of sugarcane and the occupation of the countryside and, thus, the semi-arid, took place with the pioneers following the path of fresh waters of the São Francisco River. They pioneered the far lands to capture natives for the sugar cane mills and conquer lands to be destined for livestock farming. The livestock axis in Bahia was comprised of large estates belonging to the Guedes de Brito and Garcia d'Ávila families.

Such farms had a very basic layout, with a house covered with straw, some rough corrals, a few hundred heads of cattle, and ten or twelve men —

usually captured natives, mestizos, fugitives from the police, or slaves on the run hiding on the outback. There were no fences isolating the farms and the cattle ran wild in the hinterland. To replace the fences, there were areas of about a league between one farm and another which served as a boundary. Those stripes of land were called loose cattle limits.

With the sugar crisis, the motivations for keeping livestock went down and the most prominent landowners in the region became absent, thus beginning the end of the empire of the d'Ávillas and Guedes de Brito — the Towers and Bridge Houses — at the end of the 18th century. The territories under the two great Houses were dismembered.

The farms resulting from such dismemberment, whether acquired by inheritance, purchase, tenancy or any other means to obtaining the title, bring with them the legacy of the imprecise limits of the great Houses primitive domains, as well as the non-compliance with the legal procedures to ensure the legitimate ownership of the land. Finally, the extensive nature of livestock bequeathed to these areas an undocumented land that, over time, became independent, belonging to no one.

Despite being used by local residents, these lands were returned to the Crown and deemed unoccupied. According to Germani (1993), in February 1891 with the approval of the first Constitution of the Republic of the United States of Brazil, vacant lands became the property of the States where they were located, at the advent of the Brazilian republic. It is in this context that some lands become independent and are further appropriated by rural communities in the semi-arid through the use of extensive breeding practices in vacant and heritage lands.

More recently, with the development of the productive forces, there has been the expansion of the agricultural frontier and the incorporation of previously relegated areas to the expanded reproduction of capital. The State was an important agent of this process, implementing the agro-industrial model as a path for the development of capitalism in the countryside. The implementation of fixed assets of various natures, as well as the tax incentives provided by various development groups and government promotions, generated an appreciation of space and in space, serving as a basis for the conflicts established because of the need for the private appropriation of the land, until then, considered 'independent'. (...)

Alcântara, Denilson Moreira de & Germani, Guiomar Inez. FUNDO DE PASTO: UM CONCEITO EM MOVIMENTO. PROCEEDINGS of the VIII Encontro Nacional da ANPEGE 2009. Espaço e tempo: Complexidade e desafios do pensar e do fazer geográfico. September/October 2009; Curitiba, Paraná.

Experience summary

IDENTIFICATION INFORMATION	
Practice title	RECAATINGAMENTO – Recovery and conservation of Caatinga in Traditional Fundo de Pasto Communities in the Semi-arid in Northern Bahia
Location	Brazil, Semi-arid, Northern Bahia, São Francisco Outback Territory.
Summary	Recaatingamento is a methodology for mitigating the effects of desertification and global warming. It aims to maintain associated ecosystem services, such as climate regulation, carbon sequestration, and fixation, as well as the conservation and recovery of the Caatinga biome, which is the basis of life, production, and reproduction of agropastoral and extractive communities. In its actions, it has worked primarily with the traditional Fundo de Pasto communities. In this sense, it aims to contribute so that families can recover areas in an advanced state of degradation and prepare management plans for the sustainable use of the areas that are still in a good state of conservation, especially the independent areas for collective use.
Key informant organization:	Instituto Regional da Pequena Agropecuária Apropriada – IRPA.
Documents dated from	2011 a 2021
Contact 1	José Moacir dos Santos
Email	moacir@irpaa.org
Phone	+55 74 98103-7029
Address	Avenida das Nações nº 04 - 48905-531 Juazeiro - Bahia, Brasil
Contact 2	Emanoel Amarante Zootechnist Specialist in Participatory Methodologies Applied to Research, Technical Assistance, and Rural Extension. Master in Rural Extension CAR-Pro-Semiárido
Email	emanoelfreitas@car.ba.gov.br
Practice's URL:	http://www.recaatingamento.org.br/
Others	http://www.irpaa.org

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DETAILED DESCRIPTION OF THE PRACTICE	
Context	The Caatinga Biome is a space for living, reproduction, and a source of income for the Traditional Fundo de Pasto Communities. The biome has been degraded since the Brazilian colonization due to the livestock farming system. Today, the most conserved areas are the areas occupied by these communities. Recovering and conserving the Caatinga biome is also protecting these communities' way of life.
Issue addressed	Recaatingamento aims to reduce the degradation of the Caatinga in northern Bahia so that families can recover areas in an advanced state of degradation and prepare management plans for the sustainable use of the areas that are still in a good state of conservation, especially the independent areas for collective use.
Affected population	Traditional communities of Fundo de Pasto in Northern Bahia
How is the issue impacting the population?	The experience contributes: <ul style="list-style-type: none">to avoid the emission of 350,000 tons of carbon, the sequestration of 35,000 tons of carbon; the maintenance and preservation of 10,000 hectares of Caatinga.for the recovery of 1,000 ha of Caatinga.to increase the income and citizenship of 300 families in 11 Traditional Communities of Fundo de Pasto in 10 municipalities in the semi-arid region of Bahia; andthe development of a social technology to combat desertification.
Objectives to be achieved	Recovery of 1,000 hectares of degraded areas and management for the conservation of 10,000 hectares of Caatinga.
A. Proposed topics related to the experience:	
AGRICULTURE	(x)
WATER	(x)
TRAINING	(x)
FOREST	(x)
GENDER	(x)
YOUNG PEOPLE AND TEENAGERS	(x)
CLIMATE CHANGE	(x)
LIVESTOCK	(x)
SOIL	(x)
SOCIAL TECHNOLOGY	(x)

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B. Best practice categories that apply to the experience	
ENVIRONMENTAL RECOVERY	(x)
SCALABILITY	(x)
RELEVANCE	(x)
SUSTAINABILITY	(x)
REPLICABILITY	(x)
C. Biome where the practice is applied	Caatinga Biome.
D. Local/regional environmental situation where the practice applies	The environment is degraded, but there are still preserved areas
E. Rainfall regime in the region	Rainfall regime in the region, with an average rainfall of 500 mm concentrated in 4 months. Potential evapotranspiration of up to 3,000 mm/year. Shallow soil. Granite subsoil with groundwater absent in 80% of the region.
F. Has a change in the rainfall regime been observed within the practice area?	Changes in the rainfall regime have been observed in the region of practice, as regular droughts lasting up to seven years every 20 years are characteristic of the semi-arid climate. The reduction in rainfall is also attributed to climate change. The average rainfall is 500 mm. In the last ten years, rainfall reached a maximum level of 450 mm. Average rainfall of 300 mm over the past ten years.
G. Do women, young people, native people, traditional communities, and quilombolas participate in the proposed practice?	Women, young people, and traditional communities participate in the proposed practice.

TECHNICAL DESCRIPTION OF THE PRACTICE	
Larger experience summary	Recaatingamento is a methodology for mitigating the effects of desertification and global warming. The first and main line of action includes: <ul style="list-style-type: none">• Dialogue with the community.• Choice of the degraded area to be recovered and fencing of the said area to protect it against the action of herbivorous animals.• Soil and water containment practices. The second line of action is: <ul style="list-style-type: none">• Study the animal support capacity of the community's collective and independent area.• Develop a management plan allowing for the sustainable use of the area for pasture and extractivism activities. The third action is to study and implement new rural activities capable of generating income and food without necessarily increasing the size of the goat herds.
Issue that the practice aims to address	According to the Ministry of the Environment (2007), Brazil has approximately 518,000 mi ² of Areas Susceptible to Desertification – ASD, directly impacting about 30 million people. Of this total, 13% are in a severe and/or very severe stage of degradation. ASDs are predominant in the Northeast, where 55,25% of the area is degraded to some extent. As described in the United Nations Convention to Combat Desertification (UNCCD) in its 1st article, "desertification is understood as 'land degradation in dry, semi-arid, and sub-humid areas, resulting from various factors, including climatic variations and human activities'. Therefore, combating desertification is understood as 'activities focused on the integrated use of land in arid, semi-arid, and dry sub-humid areas with a view to its sustainable development', with the objectives of "preventing and/or reducing the degradation of land, rehabilitating partially degraded land, and restoring degraded land". The United Nations' – UN 1991 World Commission on Environment, states that the development must be thought out through a logic that meets the needs of the present without compromising the capacity of future generations to also meet theirs. This challenge is yet to be faced, the establishment of a way of life that reconciles the preservation and conservation of agroecosystems, avoiding the degradation process and reducing the process of desertification in Caatinga areas. According to the Ministry of Agrarian Development (MDA, 2017), about 27 million people live in the Brazilian Semi-arid, of which 40% depend directly on the biome's resources to survive. This is evidence of the importance of the biome and the valorization of conservation and recovery practices of biodiversity and agrobiodiversity for the quality of life of the resident populations. Climatic factors allied to the inadequate use of natural resources affect human well-being, leading to issues such as a decrease in soil fertility, loss of carbon stock, higher concentration of CO ₂ in the atmosphere, increasing temperatures, among others.
EXPERIENCE SUMMARY	EXPERIENCE SUMMARY

Local and regional opportunities and restrictions

Despite being a densely populated region, it is one of the most threatened by climate change, as there are few actions to combat desertification as well as coexist with the semi-arid, with little effort to increase the resilience of the Caatinga biome and populations.

Recaatingamento was selected in a Petrobras Ambiental public notice from 2009 that sponsored actions to combat desertification and carbon sequestration actions. BNDES, in partnership with the Brazilian Agricultural Research Agency – EMBRAPA, the National Historical and Artistic Heritage Institute – IPHAN, and the Food and Agriculture Organization of the United Nations – FAO, recognized Recaatingamento as a Good Practice for Traditional Agricultural Systems in 2018. The government of the state of Bahia is now financing the proposal with resources associated with IFAD. Thus, 20 new areas of Recaatingamento have been implemented in Fundo de Pasto communities since 2019, based on notices for public calls where the IRPAA was selected.

Recaatingamento differs from other experiences of reforestation, conservation and preservation, environmental reserves, and other preservation modalities, as it seeks to strengthen centuries-old practices of use and conservation of the Caatinga by the local population.

Recaatingamento seeks scientific knowledge that strengthens the tradition of the Fundo de Pasto Communities in their relationship with the Biome.

Data were collected on the social profile of the Traditional Fundo de Pasto Communities. In the region where the initiative operates, the São Francisco Outback Territory – TSSF, located in the north of Bahia on the border with Piauí and Pernambuco, has the largest concentration of Fundo de Pasto communities in the Northeast. There are 226 Fundo de Pasto Associations registered with the Agrarian Development Coordination of Bahia – CDA.

The total collective area occupied by the associations is nearly 783 mi². There is an estimation that this way of living and producing in the Caatinga, similarly to Fundo de Pasto, is used by the absolute majority, around 95%, of family producers in the area, even though not all of them have their own registered association.

Besides desertification, the population in the TSSF faces another existential threat: the poverty rate (measured by the proportion of people with a per capita family income of less than ½ current minimum wage) is 60.02%, placing the Territory among the most impoverished in northeastern Brazil.

The percentage of illiterates, in 1991, was 41.2% of people aged 10 and over, decreasing to 26.3% in 2000, but still higher than the state average (IBGE, 1991 and 2000).

IRPAA is a reference for the Coexistence with the Semi-arid among environmental non-governmental organizations in the Brazilian Northeast. It operates in networks such as Articulação pelo Semi-árido – ASA and together with several partners (EMBRAPA, INCRA, European Union), both nationally and internationally.

The Recaatingamento Project with agro-pastoral and extractive communities is in line with the Territorial Plan for the São Francisco Outback Territory Citizenship, which identifies the need for action in areas undergoing desertification processes (3.4. Environmental management and rational use of natural resources, and 3.4.2. Biodiversity Protection).

The IRPAA has a leading role in the planning and development of the TSSF, being a co-author of the TSSF Development Plan (2008) and a founding member of the Territorial Forum (deliberative body) with 42 institutions of public power and civil society and member of the Directive Nucleus (executing instance).

PRACTICE IMPLEMENTATION

Main activities performed

- Identification and isolation of the degraded area.
- Implementation of water and soil containment techniques, such as contour lines and damming of gullies and streams.
- Seedling planting.
- Seeds and manure dispersion.
- Construction of seedling nurseries.
- Workshops and courses on the value of a strong Caatinga, fruit processing.
- Herd health and feed management practices.
- Data collection practices on the conservation of Caatinga areas.
- Preparation of management plans for the Caatinga areas.
- Workshops with teachers from schools around the communities.

When and where were the activities carried out?

The activities started in December 2009, intensified until July 2012, and continue to date with technical follow-up and monitoring visits. All activities are carried out in communities with the participation of men, women, young people, and children.

Main implementers and collaborators

IRPAA was the proponent and implementer through over time added funding. Currently, IRPAA is financed by the Pro-Semiárido Project. Fundo de Pasto Communities served as beneficiaries and protagonists; public and private entities acted as backers; research entities such as EMBRAPA and Univasf partnered in monitoring and evaluating the results.

Use of resources

Fundraising via public and private notices. Project resources, contracts, and advice. Non-refundable resources.

How were regulations, values, and culture considered in the project for the implementation of the practice?

Regulations, values, and culture were considered in the project for implementation of the practice by respecting the community's social organization culture, its way of using the land, and collectivity of work and benefits. Frequent meetings to resolve impasses regarding new developments brought about by the implementation of technologies, for example, the method and materials used in the fences.

Expected results

- Recovery of degraded areas.
- Preparation of management plans for the collective area.
- Increased food production and household income.
- Introduction of the subject in public schools.
- Disclosure of the proposal of Recaatingamento as a social technology.

Institutional structuring

Non-governmental organization.

Main activities targeted at this practice's implementation

Courses, training, field practices, regional exchanges, seminars, technical follow-up, monitoring and evaluation assistance, reports, production of audiovisual educational materials, booklets, and videos.

Main implementers and/or developers

- IRPAA – fundraiser and executor.
- Traditional Fundo de Pasto Communities – beneficiaries and executors.
- Public school teachers – qualified implementers of the proposal in schools.
- EMBRAPA – partner in results evaluation.
- Local entities (rural workers unions, parishes, non-governmental organizations) – support in the activities and dissemination of the project; Petrobras Ambiental, Misereor, and Cáritas – financiers.

If Brazilian, the good practice is aligned with the National Environmental Policy or the National Climate Change Policy and their current priorities and/or, in the case of international experiences, with other international frameworks on climate change, such as the Paris Agreement?

The experience is in line with the National Environmental Policy or the National Climate Change Policy and their current priorities.

Does the good practice have key local agents or partners capable of carrying out the experience without technical support?

The practice has main local agents or partners capable of carrying out the project without technical support, as it consists of traditional techniques added to new techniques that use local or commercial materials commonly found in the region. The methodology is simple and achievable without the need for specialists or professionals. The single element demanding a higher investment is the fence. Even so, the purchase of material to make fences is a common practice in these communities.

Does the practice use a participatory approach to involve the community?

The practice uses a participatory approach to collectively involve the community in the entire process through open meetings, defining where and how much to implement any given action. Communities are represented by their associations. The community members who actively and directly participated in the actions are listed. Frequent meetings are held with the association's board and participating members.

Methods used to monitor and evaluate the results of practical execution

During the term of the financial project, they were guided by goals and deadlines. After the financial project, IRPAA continues to follow through on monitoring visits for adjustments, maintenance, and implementation of new technologies. Through partnerships with research entities to evaluate, monitor, and systematize the results.

Is there a political commitment to implement this practice?

There is a political commitment to implement this practice through a partnership with the State Government in expanding the number of communities and areas in Recaatingamento. They are still governmental projects and programs. There is an effort towards the recognition as a social technology and listing as part of the UN's catalog of actions to mitigate climate change.

CONSIDERATIONS BEFORE EXPANSION

Criteria for the good practice's scalability: Effectiveness, Efficiency, Relevance, Replicability, Expansion, Sustainability

There is an understanding among funders and key stakeholders about the relative advantage and results of the practice to ensure ongoing commitment to support through the dissemination of results via participation in public events such as congresses and exhibitions.

Also, competing for public notices aligned with the coexistence with the Semi-arid and combating desertification

Is there an understanding among key stakeholders about the relative advantage and outcomes of the practice to ensure ongoing commitment to support – e.g., financial?

Yes, the evaluation confirms this disposition considering the results obtained by the practice, the differentiated positive qualities in the methodology, which is recognized and validated, and the cost prospecting that confers its sustainability in the long term.

If the practice calls for staff training, are you working with a training institution or considering how training can be institutionalized?

IRPAA is a training institution in the field of rural extension. It seeks to train people in the communities and bring teaching and research institutions in the process of developing the proposal.

Achieved results

Consolidated results are estimated for a period of 20 years. The results of the first 10 years are observed at the moment. The evaluation found that the isolated areas are in the process of recovery, with an increase in their seed bank and soil organic matter, fundamental elements for the emergence of new plants; the increase in the number of communities indicates that the practice captures interests.

LESSONS LEARNED

What worked really well?

The idea that Caatinga is suffering from degradation, but it is possible to work on its recovery and conservation; the proposed isolation of areas; the search for new activities other than the production of goat meat; the concept of Recreatingamento; the realization that it is possible to reconcile human presence, agroforestry activity, and Caatinga conservation.

What made the process easier?

Community participation is essential for the implementation and maintenance of the practice. As a new practice, flexibility in evaluating and replacing what does not work is critical. This assessment was made by the technical staff during the observation of how the community reacted and interacted with the techniques over the years and the search for new and improved technologies.
The fence material was an element that required modification.
The seedlings' production and planting were other elements that required modification.

What did not work?

The seedling planting methodology proved unfeasible given the incompatibility of the rainfall regime with the water requirement of the plants in their first years of life.

What are the challenges in implementing the practice?

The first challenge is developing the awareness that Caatinga, being an exclusive biome, will not respond to already established reforestation processes. There is a need to come up with new processes. This idea can be accelerated by using local communities as the main agents. It can only be sustainable when local communities are present.

FINDINGS

How did the results benefit the population?

At the global level, contributing to the reduction of the greenhouse effect by sequestering carbon; producing quality food; reducing rural exodus; making reserves of natural assets with great resilience to the effects of climate change available to science.

At the local level, the possibility of maintaining and reproducing a community way of life; the generation of food and income; the improvement of the peoples' self-esteem.

Why can this intervention be considered a "good practice"?

It proposes to strengthen a way of life that has reconciled human presence with the environmental conservation of an exclusive biome for centuries, with great potential to respond to major agricultural issues in terms of climate change; also, for being a very cheap way to protect the Caatinga.

Recommendations for those willing to adopt the recommended "good practice" or how it can help people work on a similar issue:

Seek to know the environmental situation of places devoid of paradigms built in other biomes. Caatinga and the Semi-arid are distinct from other biomes and climates. Partnerships with local communities are essential. Respecting the way the community manages its time and priorities is paramount.

Why and what makes this project a good practice?

It is cheap; easy to deploy; aligned with the interests of the local community; strengthens the way of life of the local community; covers large areas; contributes to the carbon sequestration policy; contributes to the human development policy; creates a new proposal for environmental protection;

What are the top three recommendations/conclusions you would make for others who intend to adopt the best practice?

The following are fundamental: the isolation of the area; partnerships with the community; seeking activities to generate food and income while keeping Caatinga standing; make it clear that this is a slow process.



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[https://bit.ly/
recaatingamento03](https://bit.ly/recaatingamento03)

03

JOANA MARIA DE JESUS, LAGOA DO SAL, CAMPO ALEGRE DE LOURDES

"Together with IRPAA, we saw that this project was very important in our community because we understood that it would improve the food for our animals, our own food, as well as the organization; we were going to get more united, do the work together."

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General Criteria Evaluation

CRITERION	DESCRIPTION (Descriptive report of the action)	ITEMS CHECKLIST	COMPLIANCE WITH THE YES/NO CRITERIA
Framing of the practice within the subject of confronting climate change.	Recaatingamento was selected in a Petrobras Ambiental public notice that sponsored actions to combat desertification and carbon sequestration actions.	IRPAA has a leading role in the planning and development of the TSSF, being a co-author of the TSSF Development Plan (2008) and a founding member of the Territorial Forum (deliberative body) with 42 institutions of public power and civil society and member of the Directive Nucleus (executing instance).	YES
The framing of the practice within the implementation time, preferably with a minimum of 2 years of execution, considering the time needed for the gathering of all other parameters described by the consultancy analysis while ensuring its genuine integration with the local reality.	Documentation dated from 2009-2021.	Recaatingamento was selected in a Petrobras Ambiental public notice from 2009 that sponsored actions to combat desertification and carbon sequestration actions.	YES

(X) Suitable for evaluation regarding the general criteria.

() Disqualified (marked NO in at least one of the general criteria)

GENERAL CRITERIA EVALUATION

Specific Criteria Score Analysis

CONDITION	EFFECT	SCORING SCALE
Did not submit any verification items	Disqualified: does not meet the criteria.	0
Presented at least 2 verification items	Qualified: minimally meets the criteria	5
Submitted more than two verification items	"Good practice": largely meets the criterion	10

SPECIFIC CRITERIA SCORE ANALYSIS



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04

MARLI ALVES PASSOS, COMUNIDADE DAS PEDRINHAS, REMANSO

"Recaatingamento is a great incentive for young people, for the people's coexistence in the community. Nowadays, young people stand up to people and say: 'you can't harvest wood, you can't sell it, you can't hunt... if it's for food, then ok, but if it's for sale, no.'



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Scoring by Specific Criteria

CRITERION 1	Is the result of a participatory process	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
Recaatingamento differs from other experiences of reforestation, conservation and preservation, environmental reserves, and other preservation modalities, as it seeks to strengthen centuries-old practices of use and conservation of the Caatinga by the local population.	<p>Regulations, values, and culture were considered in the project for implementation of the practice by respecting the community's social organization culture, its way of using the land, and collectivity of work and benefits</p> <p>Frequent meetings to resolve impasses regarding new developments brought about by the implementation of technologies.</p> <p>Participatory approach to collectively involve the community in the entire process through open meetings, defining where and how much to implement any given action.</p>	10
CRITERION 2	Technically possible	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
The intervention method proposed consists of identifying and isolating degraded areas, implementing hydroenvironmental actions.	<p>Formulation and implementation of management plans for the conservation of areas in good condition;</p> <p>The practice has main local agents or partners capable of carrying out the project without technical support, as it consists of traditional techniques added to new techniques that use local or commercial materials commonly found in the region.</p> <p>The methodology is simple and achievable without the need for specialists or professionals. The single element demanding a higher investment is the fence.</p>	10
CRITERION 3	Reduces the risk of disaster/crisis	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
The actions have worked primarily with traditional Fundo de Pasto – FP communities, enabling the producers' protagonism in the conservation and recovery of the environment in which they live.	<p>Prevented the release of 650,000 tons of carbon and sequestered 65,000 tons of carbon from the atmosphere.</p> <p>Implementation of sustainable production actions to diversify income and an appropriate animal management plan to adjust the Caatinga's support capacity</p> <p>Recaatingamento was selected in a Petrobras Ambiental public notice from 2009 that sponsored actions to combat desertification and carbon sequestration actions.</p>	10

CRITERION 4	Effective and successful	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
Conservation of 20,000 ha of Caatinga in 31 traditional Fundo de Pasto communities, directly involving 900 families, preserving an average of 24,000 umbuzeiro trees; recovery of 1,900 ha of Caatinga.	<p>Results dissemination via participation in public events such as congresses and exhibitions</p> <p>2000 new umbu trees were introduced.</p> <p>31 areas of environmental and economic growth from the diversified and non-timber forest use of the Caatinga.</p>	10
CRITERION 5	Replicable and adaptable	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
The methodology is simple and achievable without the need for specialists or professionals	<p>It competes for public notices aligned with the coexistence with the Semi-arid and combating desertification</p> <p>The practice has main local agents or partners capable of carrying out the project without technical support, as it consists of traditional techniques added to new techniques that use local or commercial materials commonly found in the region.</p> <p>The single element demanding a higher investment is the fence. Even so, the purchase of material to make fences is a common practice in these communities.</p>	10



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<https://bit.ly/recaatingamento05>

05

TAÍS RODRIGUES ALVES,
COMUNIDADE DAS PEDRINHAS,
REMANSO

"With Recaatingamento many people who did not know about plants now do, including young people. Today, I work with stingless bee farmers and sell honey to the City Hall."



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<https://bit.ly/recaatingamento06>

06

EMANOEL FREITAS AMARANTE, CAR TECHNICIAN, PRO-SEMIÁRIDO PRODUCTION PROJECT TECHNICIAN

"A partnership project between the State government and the International Fund – IFAD. Recaatingamento first started in 2016.

We operate in 3 regions. We consulted with the families to learn if they would be interested in recovering the degraded areas. IRPA started with the transfer of BRL 700,000 for the construction of fences and meliponaries. There is a serious issue with land grabbers. A new partnership of BRL 907,000 for the completion of the installation of fences, implementation of AFS's, and other goals established through agreements with associations in the communities starts in the second half of 2021. The application of ENVIRONMENTAL GOALS is also beginning, aimed at dealing with the reuse of water, the waste in Caatinga, biodigesters, solar energy, and so on."

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CRITERION 6	Sociobiodiverse	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
	It consists of traditional techniques added to new techniques employing local or commercial materials commonly found in the region.	
	IRPA is a reference for the Coexistence with the Semi-arid among environmental non-governmental organizations in the Brazilian Northeast. It operates in networks (ASA) and together with several partners (EMBRAPA, INCRA, European Union, etc.), both nationally and internationally. The Recaatingamento Project with agro-pastoral and extractive communities is in line with the Territorial Plan for the São Francisco Outback Territory Citizenship, which identifies the need for action in areas undergoing desertification processes.	10
	Contribute so that families can recover areas in an advanced state of degradation and prepare management plans for the sustainable use of the areas that are still in a good state of conservation, especially the independent areas for collective use.	
	Appropriate management plan for animals to adapt to the support capacity of the Caatinga.	

Total Specific Criteria Score

TOTAL SCORE OF THE ACTION ON SPECIFIC CRITERIA:	70 points
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Evaluation result for the action: Qualified Disqualified

CRITERION 7	Agrobiodiverse	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
	Development of a seed bank for native Caatinga species	
	Disclosure of the proposal of Recaatingamento as a social technology.	10
	Workshops and courses on the value of a strong Caatinga, fruit processing.	

CRITERION 8	Permeated by gender and youth issues	
NO DESCRIPTION	NO VERIFICATION ITEMS	NO POINTS ACHIEVED



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<https://bit.ly/recaatingamento07>

07

DIEGO BRITO, AGRICULTURAL TECHNICIAN

"The communities form a single territory they called "Future and Action Territory", headquartered in the Serrinha das Imagens community, where the Recaatingamento project has been taking place. There, we conduct meetings, practices, joint efforts with the participation of representatives from other communities. The purpose of the groups is to try to revert the desertification process by sustainably using natural resources. I believe we can only live well in the area with that which caatinga provides us, so we have to take care and preserve it."



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experience.

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08

DIEGO BRITO,
AGRICULTURAL
TECHNICIAN

"The learning circles
served to strengthen
the community's
thinking on
Recaatingamento and
the preservation of
native seedlings."

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Comments

The experience of Recaatingamento is, above all, something close to poetry in the guise of science. It is ideal and social mobilization together, active, and integrated. In particular, during the materials collection research, the hearing about how each step was overcome and assured from its inception with the achievement of Petrobras Ambiental financing was, in fact, due to its history within a fierce environment of disputes for resources, a testimony of a kind of synthesis of one of its great differentials: IRPAA is an organized civil society.

It seems important to draw parallels beyond the results obtained, presenting institutional aspects as a qualitative element of analysis in systematization cases.

For IRPAA, the breadth of articulations, participations, partnerships, and cooperation in local, regional, national, and international dimensions is impressive, introducing verticality and horizontality into the debate, often leading to the execution of activities. Such results are not computed or described in any record and measurement documents of the practice.

Is also noteworthy the dilemma faced in systematization of considering one of the criteria used to reference a good practice left without a clear description, which was the [experience being] 'Permeated by gender and youth issues,' because, strictly speaking, there is no method to validate that there is a well-defined intention for these issues, as it is somehow perceived in the prevalence of the domination of the 'head of the family' (usually a male figure).

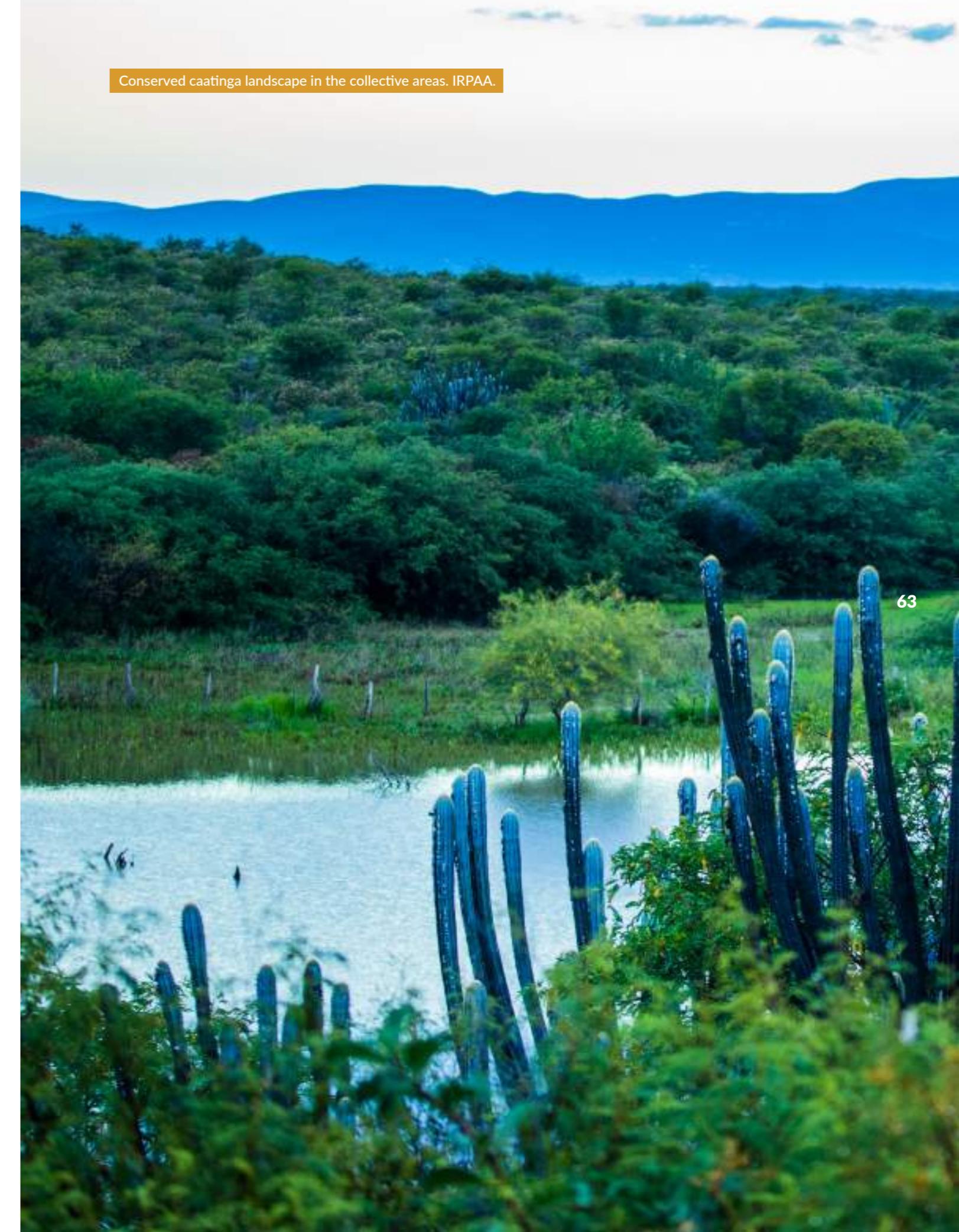
Same way as AFSs, *Recaatingamento* was designed to be composed by the families, without the necessary distinction of what ultimately happens, when the traditional models of organization and structure are repeated.

Concerning what is the main practice of the *Recaatingamento* experience associated with part of the basic and applied research in what is called Restoration Ecology. It derives from classical concepts of Ecology. Among these, ecological succession is perceived as one of the most relevant for restoration projects and also the basis of syntropic agriculture. This concept has been used to predict, improve, and replace natural vegetation dynamics.

Ecology is, however, an evolving science that should be part of the Projects' conceptual framework.

Restoration would, therefore, serve as an attempt to reproduce/mirror the ecological processes that originally took place in that particular environment. Accelerating the natural regeneration, directing its succession to the return of ecological processes to achieve the system's long-term sustainability. Therefore, it is absolutely essential that the Projects are concerned about what they mean in the physical environment, the restoration rate of each territory, and its maintenance. In this sense, this dynamic involves the need for continuity of care and protection for plants for several years after planting.

Conserved caatinga landscape in the collective areas. IRPAA.



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Aroeira that grew spontaneously. Source: IRPAA.

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Associated with how the soil is used and water resources management, ecological restoration currently practiced is driven by the need to mobilize the ecosystems' capacity to self-modify while subject to external events and create a greater self-sustaining capacity in the future.

Its practice involves understanding the functionality of natural ecosystems, from the development of appropriate technologies for different environmental, economic, and sociocultural contexts, to the development of sustainability indicators capable of facilitating the monitoring and evaluation of the effectiveness of the intervention carried out. This has been the contribution of research institutions such as EMBRAPA.

Small properties, where riparian forest areas and legal reserves were converted into land for agricultural activity, thus, resulting in all the reported impacts. This is reinforced by the lack of information, qualified technical assistance, and financial incentives, meaning such areas still lack restoration prospects.

This set is the action focus of the *Recaatingamento* experience. As such, it happily incorporated the coming into effect of the Forest Code, approved in 2012.

According to this Law no. 12,651/2012, Permanent Protection Areas and Legal Reserves in a state of degradation must be restored within a period of nine and twenty years, respectively.

Perhaps it would be interesting for IRPAA to more emphatically adopt the other branch that is growing in Brazil, of actions combining forest restoration and carbon neutralization.

PODCAST

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[https://bit.ly/
recaatingamento09](https://bit.ly/recaatingamento09)

09

DIEGO BRITO,
AGRICULTURAL
TECHNICIAN

"It is important to highlight the threat that Serrinha had been facing with land grabbing... Its conflicts. Today, we can say that *Recaatingamento* serves as a tool in the struggle in the defense of the land. It also allows for the strengthening of the community regarding the preservation of those areas."



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Avocado irrigation. Source: iDE.

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GOOD PRACTICE 2

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The Prolenca

The objective of the Project for Competitiveness and Sustainable Development in the South-Western Border Region – PRO-LENCA¹ is improving the income, employment opportunities, food security, and living conditions of the poor, with a focus on social inclusion and gender equity. The central strategy of its intervention is to improve employment opportunities, food security, and life conditions of the rural population, either poor and/or in extreme poverty, with a focus on social inclusion and gender equity.

As one of its basic points, the Project's strategy aims at recovering, privileging, and maintaining the main characteristics and cultural practices of the Lenca ethnic group. One of such characteristics is the tradition of working in communities or groups, evidenced by the large number of existing or developing organizations (some exclusively of women or young people). Based on Lenca traditions and positive experiences of the Project, a central strategy is to focus on the financing of actions foreseen in the community development plans through non-reimbursable contributions.

Thus, the design of the community project generated in a participatory manner should take place at a higher level of autonomy and management, through the full delegation of the implementation by the beneficiary institutions.

The Project covers a geographical area of 2,471 mi², with a group of 36 municipalities in the departments of La Paz (3), Intibucá (13), and Lempira (20), prioritized according to poverty indicators, as well as their development potential with the presence of rural populations organizations from the Southwest of Honduras.

PRO-LENCA works with organized groups of small producers, called Beneficiary Organizations (BO's). Its 481.30 hectares of cultivated soil are split into: 306.00 of corn; 149.00 of beans; 17.00 of wheat; 2.3 of tomatoes; and 7 of potato.

Another 11 municipalities were included, served by the "Horizontes del Norte Project", in which there are demands for the commitment of resources to the beneficiary organizations in 3 departments: Atlántida (4 municipalities); Cortés (2), and Santa Bárbara (5).



VÍDEO

Watch the video and learn more about pro-lenca:

https://www.youtube.com/watch?v=fGINviS8_v8

¹ Proyecto de Competitividad y Desarrollo Sostenible del Corredor Fronterizo Sur Occidental – PRO-LENCA – Project N°. 1.100.001.682

Contextualization on the environment and climate change in Honduras

The second-largest country in Central America, after Nicaragua, the Republic of Honduras spreads across 43,24 mi², with a perimeter of 1,492 mi. Of these, 992 mi are borders, and nearly 500 mi are coastal areas. The Atlantic coast extends for about 404 mi, while the Pacific coast, is 96 mi long. This area corresponds to the interior of the great Gulf of Fonseca. The Republics of El Salvador and Nicaragua exercise sovereignty over the two stripes of land that border the Gulf.

Given its location in the middle of the isthmus, Honduras is the only country that has territorial borders with three of its former members of the Central American Common Market – CACM, El Salvador, Nicaragua, and Guatemala. It also has maritime borders with Guatemala, Belize, Mexico, Cuba, Jamaica, Caiman, Colombia, and Nicaragua in the Caribbean.

A mountainous structure splits the country into three natural areas: the lowlands of the Caribbean Sea, the highlands of the interior, and the lowlands of the Pacific, with the central mountainous area grouping its mountain ranges into two systems to the east and the west. In between, there is a central corridor of land, mostly flat, crossing the country from north to south. Of the total Honduran surface, 70% is over 984 ft above sea level, while 55% rises above 1968 ft. Areas of forest canopy cover over half of the country, being 20% pine forests, 25% broadleaved forests, and 5% presenting mixed characteristics.

The largest ecological formation, corresponding to 35.4% of the Honduran territory, is the subtropical humid forest. Found between 1968 and 4921 ft above sea level, it is home to great biological diversity. Despite the large forest extension, forestry is not the most relevant activity, with peasant agriculture, coffee plantations, and other high-altitude cultivation practiced in the mountains. Suitable areas for agriculture constitute around 35% of the national territory

and are located mainly on the north coast and in the south-eastern region.

The two longest rivers in Central America are born in Honduras. 466 mi long, the Coco River separates the territories of Honduras and Nicaragua for a good part of its course, while the Patuca River runs for over 366 mi. Both rivers flow into the Caribbean side and are partially navigable by small boats. On the other hand, none of the three largest rivers that flow into the Gulf of Fonseca – such as the Choluteca, 217 mi – is navigable. The mountainous aspect and the relative frequency of rainfall allow for hydroelectric production in many parts of the country.

Rainfall is distributed in two seasons throughout the year – dry and rainy. The dry season extends from January to April, while the remaining months are usually rainy. Under normal weather conditions, the average temperature fluctuates between 64 °F and 93 °F. In the lowlands region of the Caribbean Sea, high temperatures prevail, with significant rainfall and great biodiversity. Its alluvial soils are fertile, favoring the development of agribusiness and urban expansion.

In the highland region of the interior, there are valleys of agricultural vocation, with low rainfall and high biological diversity; mountainous soils are usually not extremely fertile, being predominantly acidic due to the presence of conifers and holding an average temperature. In the lowlands of the Pacific, there is little rainfall, agriculture suitable soil is scarce, and temperatures are predominantly high.

In the territorial sea and adjacent commercial zones, the abundant maritime and fishing resources constitute a heritage of the population of the coastal and insular departments.

Honduras registers no active volcanoes and, while unaffected by the geological San Andreas Fault, its territory lies relatively protected from the earthquakes that frequently hit its neighbors.

Its main environmental issue is the degradation and loss of the soil due to intense deforestation, grazing, and cultivation in high slopes or low and humid lands, which are not suitable for these activities. Environmental degradation has a socioeconomic nature: the action of economic forces with unsustainable patterns of agricultural production and forest exploitation implemented both in the past and present days. The destruction of basins, pollution, and biodiversity decline are serious environmental problems associated with this overarching issue.

AGRICULTURE AND THE EXPLOITATION OF THE FOREST

Most Honduran producers are peasants who practice subsistence agriculture, harvesting mainly corn and beans. They use traditional means of production, with precarious access to land, low yield, and severe environmental damage. Also, the presence of intermediaries in the market chain, paying close to nothing for the producers while selling at steep prices to the final consumer, generates uneconomical results and subject the farmers to poverty.

Small and medium agricultural production and livestock are the traditional source of work for the rural population, maintaining artisanal characteristics and contributing to the domestic market. Grains, vegetables, meat, and milk are produced. As of 1985, when state protection ceased, rural producers began to face recurrent crises due to high production risks, low productivity, little competitive capacity under market conditions, lack of technology, a heavy intermediation chain, and increased financial costs.

The local measurement of production, whether kilo or tons, is made per manzana (one manzana equals little more than half a hectare) of bananas, corn, beans, or rice whose productions supply 90% of the domestic market.

It is noteworthy that the cultivation of coffee, mainly for export, takes place in mountainous regions, 2,296 ft above sea level. In Honduras, there is no coffee oligarchy and the cultivation, introduced in the first half of the 20th century, is carried out by nearly 90,000 small growers, who produce around 170,000 metric tons a year, while the processing and exporting businesses are dominated by large companies.

Between 1960 and 1980, the agrarian reform gave birth to a new productive nucleus, the reformed sector, constituted by peasants organized in cooperatives and associated companies and oriented towards non-traditional production for export. With little competitiveness, this sector saw the beneficiaries of the agrarian reform sell their lands when state protection ceased and land operations involving its members were allowed. This led to the near disappearance of the reformed sector.

By Ramón Romero and

Fernanda Gdynia Morotti

[Parts of the text were extracted from the Encyclopedia Latino América website

<http://latinoamericana.wiki.br/verbes/h/honduras>], accessed on 12/07/2021.



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experience.

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01

JOSÉ LUIZ RODAS
HERNANDEZ,
IDE FACILITATOR,
TECHNICAL
ASSISTANCE TO
THE MULTISERVICE
COMPANY

[...] plantations established under some principles underlying the sustainable management of both soil and crops, and other actions that contribute to the adaptation to climate change. The modality of technical assistance is based on a methodology that links group and individual interventions. [...] Training modules aimed at soil conservation are developed. [...]

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In this scenario, PRO-LENCA was born as a response to the tragic severe weather events that occurred between 1998 and 2017 and have been increasing since 2014. Honduras was one of the most affected countries, with almost a hundred events between intense rains, prolonged droughts, and hurricanes. The consequences of the climate crises were losses that amounted to around 600 million dollars in damages, especially in agriculture.

Thus, the high occurrence of food insecurity in areas exposed to the risk of natural disasters justified the need for actions to promote improvements in agricultural production in the context of planning based on sustainable development, with an emphasis on climate change.

For centuries, Honduras has been subject to issues of different natures, such as the persistence of serious socioeconomic asymmetries, high unemployment rates, lack of economic growth, scarce national and international investment, and massive migration of the population from the countryside to the city and abroad.

Figure 1 shows a map of PRO-LENCA (2020) prepared for the Integrated Context Analysis (ICA) and helping to provide a basis for decision making for the selection of areas that received the experiences supported by the Project. In regions with high levels of food insecurity, which are exposed to the risks of being affected by climate change and still markedly reliant on agricultural production.

In this sense, it would be justified to increase the aspects of managing the risks from significant changes in the means of land use, the search for food security, the combat of poverty aligned with technologically advanced sustainable agricultural practices, as well as the attaining of new markets.

In the municipality of Yarula, in region 1B of the map (figure 1), there was the decision to support the Empresa de Servicios Multiples Sistema de Riego Zacate Blanco, Ciprés y Los Puentes (Zacate Blanco, Ciprés y Los Puentes Multiservice and Irrigation Systems Company), founded in 1998, which had 46 partners at the time of the experience, in 2018.

The Multiservice Irrigation System Company is a private enterprise that economically and rationally exploits the properties (rural property) where agricultural services or goods are produced for sale. Before PRO-LENCA, the Company's land cultivation was based mainly on corn and beans, mostly for subsistence production or, less often, to the final consumer, with the products sold directly in Yarula markets.

Although this was not the focus of the practice, it is estimated that there is also cattle farming for the production of meat and other products of animal origin (such as milk).

Finally, another attribution intended was the transformation of surplus agricultural products produced through land cultivation and livestock farming; various products could be produced from those raw materials (flour, dairy products, jellies, etc.).

The Company stood out for providing an important service through the offer of an irrigation system. However, it was found that the equipment was severely obsolete and was associated with huge water loss.



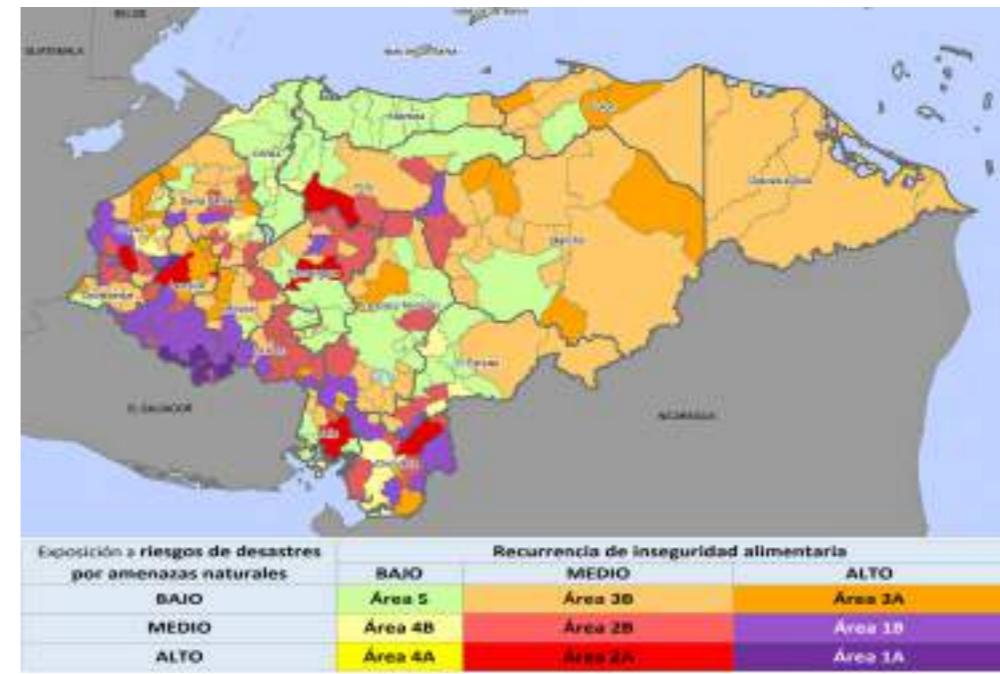
Potato grower. Source: iDE.



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Impluvium at the Francisco Morazán Institute (IFM). Source: iDE.

FIGURE 2. MAP RESULTING FROM INTEGRATED CONTEXT ANALYSIS (ICA)



Source: iDE, 2020.

However, in addition to the profit shared between the partners, the Company also aimed to obtain the best cost-benefit in the markets in which it operated, taking care of the processes related to production and commercialization, although this aspect would also show many difficulties and limitations.

PRO-LENCA's objective was, therefore, to empower the institution through a productive development plan associated with administrative strengthening, while applying climate-resilient technologies. The results obtained involve obtaining a commercial focus for the institution, a trained and strengthened administrative body and an efficient and resilient production system.



Click here to listen to podcasts with testimonials from the protagonists of this experience.

[https://bit.ly/
honduras2](https://bit.ly/honduras2)

02

CARLOS FLORENCIO ARRIEGA,
STRAWBERRY PRODUCER,
YAMARANGULA TOWN

GOOD PRACTICE 2

"We had mostly lost the connection with production but, thank God, we started to cultivate again. I've been growing strawberries for about 15 years, and they helped me raise my children. One of them has a bachelor's degree, one is an agronomist, and the other two are students. I'm with FRESAL, an Altiplano strawberry producers' association. We postulated a project for PRO-LENCA and, thank God, they gave us funds to buy strawberry seedlings. iDE gave us a counterpart with funds that were used to build macro-tunnels. iDE [also] gave us lectures on how to organize and adapt to climate change."

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Experience summary

IDENTIFICATION INFORMATION	
Practice title	Empresa de Servicios Múltiples Sistema de Riego Zacate Blanco, Ciprés y Los Puentes [Zacate Blanco, Ciprés y Los Puentes Multiservice and Irrigation Systems Company].
Location:	Zacate Blanco, Ciprés, and Los Puentes, Honduras.
Practice summary	<p>In 2019, PRO-LENCA and the International Development Enterprises – iDE kick-off an action to implement agricultural technologies with a climate resilience motto adapted for families with scarce economic resources, the Project's target population. Thus, Zacate Blanco, Ciprés y Los Puentes Multiservice and Irrigation Systems Company, comprising approximately 46 member families, receives investments in agricultural projects to improve production; support for the acquisition of equipment and supplies; technical assistance for monitoring production and marketing; and training in business management and enterprise improvement. With strategic planning focused on improving the adaptive capacity of production and producers, with new knowledge for the creation of more resilient and high added value vegetable growing systems (for vegetables and legumes) together with the implementation of irrigation water management techniques, such as drips, significant results can be perceived in the region in a few months, as the Company affects three communities. An estimated 1,200 people benefited both directly and indirectly from the results obtained with the increased income, diversified production, better market value for the products, and social effects, such as the reduction of indebtedness and reduction of seasonal migration of families for coffee harvesting in other locations. There was also the implementation of strategic infrastructure such as the planting of species that work as wind resistance barriers and a drip irrigation system, soil management with vegetation cover and fewer pesticides, springs recovery, among other practices with less impact on the natural environment.</p>
Key informant organization	International Development Enterprises – iDE.
Documents dated from	2017 – 2021
Contact	Sobeida Lisseth Lara
Email	slara@ideglobal.org
Phone	+504 9459 3143
Address	Col. Tepeyac., Calle Frolíán Turcios No.2240-A, Tegucigalpa, Honduras.
Office	Country Program Manager
Institutional URL	ideglobal.org
Practice's URL:	https://www.ideglobal.org/themes/climate-resilience https://web.facebook.com/PROLENCA/?ref=page_internal&_rdc=1&_rdr

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DETAILED DESCRIPTION OF THE PRACTICE

General context and justification for the practice	<p>In the last decade, the Central American country has been the second most affected by hurricanes, storms, and floods according to the Climate Risk Index – CRI produced every year by NGO Germanwatch. The Gulf of Fonseca in the south of the country is painted red on all maps prepared by climate change experts, and it is predicted that the area will soon be flooded by the sea, as will Myanmar, Dominica, and the Caribbean islands of Panama. This past year, the hurricane season was the most damaging ever recorded. With the frequency of the impacts of these phenomena, poverty and other socioeconomic and environmental issues were aggravated in the region.</p>										
Issue addressed	<p>The region still uses bad practices such as burning, deforestation, shifting cultivation, poor planting densities, so changing attitudes and developing environmental and productive values are key to the experience. Also, the lack of financial resources results in heavy emigration in Yarula during the coffee harvest, which usually helps with the payment of debts and purchase of supplies by local farmers. Frequent losses of agricultural production caused by droughts, heavy rains, frost, and strong winds, associated with poor land use, water and fertility losses, low-yield production and commercial difficulties, and other effects of climate change in the region, generate further poverty and misery, indebtedness, and environmental impacts due to the low technical quality of land use.</p>										
Affected population	<p>Directly, the partners of the Company, and, indirectly, the related production chain.</p>										
Objectives to be achieved	<ul style="list-style-type: none"> • Planning interventions based on prioritizing adaptation measures or climate-smart agriculture. • A participatory process in the design of interventions. • Investment in processes to increase the regional agricultural chains' resilience, including vegetable species with greater commercial value. • Training and technical assistance integrated into production. • Improvement of the institution's business management. • Investments in supplies and equipment. • Improvement in infrastructure, such as the replacement of the sprinkler drip irrigation system. • Decrease in water, soil, and biodiversity losses. 										
<p>A. Proposed topics related to the experience:</p> <table border="0"> <tr> <td>AGRICULTURE</td> <td>(x)</td> </tr> <tr> <td>TRAINING</td> <td>(x)</td> </tr> <tr> <td>GENDER</td> <td>(x)</td> </tr> <tr> <td>YOUNG PEOPLE AND TEENAGERS</td> <td>(x)</td> </tr> <tr> <td>CLIMATE CHANGE</td> <td>(x)</td> </tr> </table>		AGRICULTURE	(x)	TRAINING	(x)	GENDER	(x)	YOUNG PEOPLE AND TEENAGERS	(x)	CLIMATE CHANGE	(x)
AGRICULTURE	(x)										
TRAINING	(x)										
GENDER	(x)										
YOUNG PEOPLE AND TEENAGERS	(x)										
CLIMATE CHANGE	(x)										

GOOD PRACTICE 2

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B. Best practice categories that apply to the experience:	
SERVICE DELIVERY	(x)
LEADERSHIP	(x)
ENVIRONMENTAL RECOVERY	(x)
ACCESS TO WATER	(x)
SCALABILITY	(x)
EFFECTIVENESS	(x)
EFFICIENCY	(x)
RELEVANCE	(x)
SUSTAINABILITY	(x)
REPLICABILITY	(x)
C. Biome where the practice is applied	Dry forest ecoregion
<p>It corresponds to a tropical habitat with a prolonged dry season of 5 to 8 months and is home to important plant and animal species, together with a significant degree of endemism. Represented through less than 2% of the original habitat, this fragmented ecoregion is threatened by strong pressure from man, livestock, fires, agricultural expansion, and hunting operations. Tropical dry forests are now way rarer than tropical forests, although the latter are also disappearing at a very fast rate. Honduras is one of the poorest and least developed countries in the Americas. Agriculture is an important part of its economy, employing nearly two-thirds of its workforce. The main products in the export basket are coffee, bananas, and shrimp.</p> <p>The territory of Honduras is highly uneven, comprising mountains, plateaus, deep valleys, and extensive and fertile plains, crossed by navigable rivers. All of which contribute to its rich biodiversity. It is estimated that there are about 8,000 species of plants, 250 of reptiles and amphibians, over 70,015 species of birds, and 110 of mammals spread across different ecological regions in Honduras.</p> <p>Vegetation</p> <p>In Honduras, the predominance is of tropical vegetation in the plains and low slopes. In the valleys and basins between the mountains, pine and oak forests are dominant. In small areas, such as east of Tegucigalpa, there are occurrences of savannah. Honduras has been affected by droughts since 2014. The problem is aggravated by the exploitation of natural resources in favor of mega-mining or hydroelectric projects.</p>	
E. Rainfall regime in the region	The rainfall regime in the region is scarce, amounting to less than 300 mm/year in some areas.
F. Has a change in the rainfall regime been observed within the practice area?	A change in the rainfall regime in the region of practice was perceived: It rains less, regardless of it being a region frequently hit by hurricanes and storms.
G. Do women, young people, native people, traditional communities, and quilombolas participate in the proposed practice?	There was the participation of women, young people, indigenous people, and traditional communities in the practice, with emphasis on the indigenous Lenca people, the oldest in Honduras

TECHNICAL DESCRIPTION OF THE PRACTICE	
How was the practice selected or designed?	Considering its interest in implementing environmental, productive, commercial, and organizational aspects through investments for organizations of people living in poverty, the practice was selected for being a good fit within the context of PRO-LENCA and iDE's work. The Company agreed to carry out the proposal through planning focused on reducing environmental vulnerability in production systems as an axis for reducing environmental/climatic vulnerability.
Local and regional opportunities and restrictions	Local and regional opportunities and restrictions on work, income, health, environment, gender, youth, policies, and other institutional factors were taken into consideration before the design of how the practice would be implemented. Among some of the aspects considered, the climatic threats that affect crops stand out from the threats and difficulties point of view; as well as the increase in pressures due to the pests and diseases caused by climatic variations and the lack of information on these issues. Of the local weaknesses involving the company and commercial activities, stand out the little participation of the Company's members in collective activities, members' emigration to other locations during coffee harvests, difficulties in marketing the products, bad agricultural and environmental practices, and the little adoption of appropriate technologies for climate change

PRACTICE IMPLEMENTATION	
Main activities performed	On agriculture for the climate: encouraging climate adaptation, improving income and sustainable production, and mitigating climate change.
When and where the activities were carried out	Since 2019, the company has been influencing three communities, with results indirectly benefiting around 1,200 people.
Main implementers and collaborators	This initiative was carried out by the International Development Enterprises – iDE, contracted by the Project for Competitiveness and Sustainable Development in the South-Western Border Region – PRO-LENCA, executed by the Secretariat of Agriculture and Livestock – SAL, and financed by the International Fund for Agricultural Development – IFAD, and the Global Environment Facility – GEF.
	TOTAL: 2,762,445.49 Honduran Lempiras. Approximately US\$115,101.90
Use of Resources	HSAL/PRO-LENCA's contribution: 2,488,698.58 Honduran Lempiras. Approximately \$103,695.77 iDE counterpart: 273,746.91 Honduran Lempiras. Approximately USD \$11,406.12 [\$1 = 24 Honduran lempiras/June 2021].
Regulations, values, and culture implemented by experience	The Company adopted climate-smart planning; is developing new agricultural technologies based on the protection of the environment, water, and soil at their partners' plots and properties; is searching for continued technical improvement, while investing in sustainable and modernized infrastructure, good quality supplies, and reliable equipment. It also encourages and adopts institutional management based on participatory, effective, and inclusive processes for the partners, besides improving the production chain and better marketing with an increase in collective and individual income.

STRUCTURE	
Private	(x)
Federal government	(x)
International organization	(x)
Main activities targeted at this practice's implementation	Promoting climate adaptation: 1. Climate vulnerability analysis and climate change adaptation measures. 2. Training and technical assistance. 3. Hydraulic infrastructure assessment. 4. Improvement of hydraulic infrastructure. 5. Installation of drip irrigation systems. 6. Improved sustainable production and income 7. Climate change mitigation
Top implementers / local/national collaborators working specifically on the implementation of the practice	This initiative was carried out by the International Development Enterprises – iDE, contracted by the Project for Competitiveness and Sustainable Development in the South-Western Border Region – PRO-LENCA, executed by the Secretariat of Agriculture and Livestock – SAL, and financed by the International Fund for Agricultural Development – IFAD, and the Global Environment Facility – GEF.
Does the good practice have key local agents or partners capable of carrying out the experience without technical support?	In principle, the Company's partners still receive technical assistance from the Project. There is technical support by the main local agents or partners with the capacity to carry out the experience. Technical assistance was key in the aspects of training, planning, and implementing the technologies. To reinforce knowledge, a lead partner's land parcel was defined as a benchmark for demonstrative purposes; similarly, the Instituto Cristina de Borbón (supported by PRO-LENCA and assisted by iDE), also masters the methodology for the different adaptation options and early warning systems for irrigation. Specialized support, provided by specialists in climate change adaptation technologies permanently present in the area, was crucial for the achievement of the goals. The Yarula Mayor's Office also advised the producers through its technical team.
Does the practice use a participatory approach to involve the community?	There was a participatory approach to involve the community by mobilizing the Company's partners to act in the training, planning actions, implementing activities – in the form of supply application across properties –, equipment operation and construction works, as they were also part of the counterpart to the Project.
Does the practice have mechanisms for reviewing, sharing progress, and incorporating new learning into the implementation process?	The updating of technical knowledge takes place through collective demonstrations, field trips, visitations, and the provision of consultation materials.

CONSIDERATIONS BEFORE EXPANSION

Is there an understanding among the sponsors and key stakeholders about the relative advantage and outcomes of the practice to ensure ongoing commitment to support – e.g., financial?

There is a commitment to financial support, with continued investments and sustainability of some activities such as the monitoring and maintenance of recovery plantations in degraded areas, as well as continued technical assistance to the Company's partners. On the other hand, PRO-LENCA is in its fourth year of execution. According to the financing agreement, its activities are scheduled to conclude in September 2022, while GEF's donation should continue until June 2020. The Project has received resources to operate since May 2016.

Achieved results:

The practice achieved significant results due to the good design and implementation by the Company's partners in various integrated activities based on the pillars of climate-smart agriculture. There was a significant reduction in pressure on water sources; decreased vulnerabilities to prolonged droughts; adoption of three technologies, eight practices, and six climate change adaptation measures; 20% of women members of the company had access to technologies, being trained and economically empowered; adoption of agroecological products; a change in attitudes and values towards climate change.

Main results obtained by the practice regarding the achievements:

Low irrigation areas cultivated with high-value species; 35 installments had drip irrigation systems implemented; transition from subsistence to diversified commercial agriculture; reduced emigration; improved family diets across the area.

Practice's effectiveness level in general terms and, specifically, in terms of benefiting groups or communities where it was implemented:

Besides the positive implications of dealing with the phenomena of climate change, it was possible to regain farmers' confidence, enthusiasm, and dedication to their land with the help of the intense work, the permanent presence of support, assistance, and adequate monitoring added to the availability of good quality supplies, equipment, and technologies to reduce damage in high-value cultivars.

LESSONS LEARNED

What worked really well? Training and technical assistance to farmers.

What made the process easier? Local governments' participation, especially regarding farmers' support.

What did not work? Pesticides are still used to fight pests.

Why did it not work? Because it is terribly difficult to change deeply ingrained habits that quickly ease problems such as disease and insect attacks. There is the need for further implementation in a much larger territory with longer time horizons to observe the results of changing attitudes influencing communities of rural producers to consume alternative and agro-ecological products, such as high-fertilizing Bokashi and mineral syrups to combat microorganisms that cause diseases in vegetable plantations.

FINDINGS

How did the results benefit the population?

The Company started to operate with commercial success, generating wealth and systemic improvements for their associates' rural properties, besides the environmental effects resulting from the exercise of good practices, with environmental recovery and potential for greater water availability in the near future. With the new gains and the improvement in the production of potatoes, for example, new opportunities for accessing markets are available. The exploration of new markets can advance towards the sale of products in the context of the National School Lunch Program, which pays better prices.

Why can this intervention be considered a "good practice"?

Because it provides an integrated set of evaluation, planning, new technologies, investments, support, and continuous training that allow for significant results to be achieved in a short time by the participants of a collective of farmers.

General Criteria Evaluation

CRITERION	DESCRIPTION (Descriptive report of the action)	ITEMS CHECKLIST	COMPLIANCE WITH THE YES/NO CRITERIA
Framing of the practice within the subject of confronting climate change.	<p>Beforehand, PRO-LENCA's central intervention strategy aims to improve employment opportunities, food security, and life conditions of the poor rural population, with a focus on social inclusion and gender equity. This set of conditions was permeated by planning and actions based on combating climate change in Honduras, applied by the experience with the Company's activities during the two years of implementation.</p>	<p>Among the main activities involved in the implementation of this practice is the "Promotion of climate adaptation: climate vulnerability analysis and climate change adaptation measures".</p>	YES
The framing of the practice within the implementation time, preferably with a minimum of 2 years of execution, considering the time needed for the gathering of all other parameters described by the consultancy analysis while ensuring its genuine integration with the local reality.	<p>PRO-LENCA is in its fourth year of execution. According to the financing agreement, its activities are scheduled to conclude in September 2022, while GEF's donation should continue until June 2020. The Project has received resources to operate since May 2016.</p>	<p>The documentation of the experience dates from 2017-2021.</p>	YES

Specific Criteria Score Analysis

GOOD PRACTICES IN THE COMBAT OF CLIMATE CHANGE

ANALYSIS		
CONDITION	EFFECT	SCORING SCALE
Did not submit any verification items	Disqualified: does not meet the criteria.	0
Presented at least 2 verification items	Qualified: minimally meets the criteria	5
Submitted more than two verification items	"Good practice": largely meets the criterion	10

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Scoring by Specific Criteria

CRITERION 1	Is the result of a participatory process	POINTS ACHIEVED
DESCRIPTION	ITEMS CHECKLIST	
As one of its basic points, the Project's strategy aims at recovering, privileging, and maintaining the main characteristics and cultural practices of the Lenca ethnic group, hence the Company in Yarula, which strongly combines this characteristic.	<ul style="list-style-type: none"> 1. Tradition of community or associated actions, 2. Large number of existing or developing organizations (some, exclusively for women or young people) 3. Autonomy and management through the full delegation mechanism for the implementation of the community development plans for the beneficiary organizations. 	10
CRITERION 2	Technically possible	POINTS ACHIEVED
DESCRIPTION	ITEMS CHECKLIST	
To reinforce knowledge, a lead partner's land parcel was defined as a benchmark for demonstrative purposes; similarly, the Instituto Cristina de Borbón (supported by PRO-LENCA and assisted by iDE) also provides different adaptation options and early warning systems for irrigation.	<ul style="list-style-type: none"> 1. Hydraulic infrastructure assessment and improvement. 2. Full delegation of the implementation of community development plans to beneficiary organizations. 3. Installation of drip irrigation systems. 	10
CRITERION 3	Reduces the risk of disaster/crisis	POINTS ACHIEVED
DESCRIPTION	ITEMS CHECKLIST	
The environmental, productive, commercial, and organizational aspects of the Zacate Blanco, Ciprés y Los Puentes Multiservice and Irrigation Systems Company took the issue of reducing environmental vulnerability in production systems as an axis for reducing environmental/climatic vulnerability in their planning and actions	<ul style="list-style-type: none"> 1. Changing in attitudes and development of environmental and productive values 2.. Optimization of the use of the water resources available. 3. Application of agricultural techniques with the bias of mitigation and adaptation to regional climate contexts. 	10

GOOD PRACTICE 2

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CRITERION 4	Effective and successful	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
Results achieved due to good design and implementation based on the pillars of climate-smart agriculture, for example, with the adoption of agroecological products with high added value.	<ul style="list-style-type: none"> 1. Technical assistance in the aspects of training, planning, and implementing the technologies. 2. Decrease in emigration to other places to obtain resources from the coffee harvest. 3. Focus on financing the investments generated by the processes in the Republic of Honduras through non-reimbursable contributions. 	10
CRITERION 5	Replicable and adaptable	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
Implementation based on the pillars of climate-smart agriculture.	<ul style="list-style-type: none"> 1. Low irrigation areas cultivated with high-value species. 2. Potential for greater water availability in the near future. 3. Training and technical assistance to farmers. 	10
CRITERION 6	Sociobiodiverse	
NO DESCRIPTION	NO VERIFICATION ITEMS	NO POINTS ACHIEVED
CRITERION 7	Agrobiodiverse	
NO DESCRIPTION	NO VERIFICATION ITEMS	NO POINTS ACHIEVED
CRITERION 8:	Permeated by gender and youth issues	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
One of the characteristics of the cultural practices of the Lenca ethnic group is the tradition of community or associated action.	<ul style="list-style-type: none"> 1. 20% of women members of the company had access to technologies, being trained and economically empowered. 2. Large number of existing or developing organizations (some, exclusively for women or young people). 	5

Total Specific Criteria Score

TOTAL SCORE OF THE ACTION ON SPECIFIC CRITERIA:	55 points
--	------------------

Evaluation result for the action:
--

<input checked="" type="checkbox"/> (X) Qualified	<input type="checkbox"/> () Disqualified
--	--

Comments

From the outset, the systematization of the experience with the Multiservice Irrigation Company within the scope of PRO-LENCA demonstrated the need for an approach with a fundamentally qualitative bias. Elements with aspects measurable by the collection of opinions, returns, and motivations that somehow converted into objective characteristics were pursued.

In this sense, stands out the vast content disseminated by PRO-LENCA across social networks, especially on the project's page on Facebook. The company's experience in Yarula was taken as a significantly smaller sample so that it was possible to observe the positive results from a distance.

With an abundance of imagery, testimonies, and videos, it is possible to identify the expression of the beneficiaries by validating the proposals, offering questions, answers, and suggestions, developing new ideas and many real observations that (can) effectively entice the 'browser' to explore, understand, and, finally, adopt the ideas.

The adherence to the systematized experience is the "soul" of the indicator chosen to validate it in its most realistic instance: the daily lives of those who put it to use, a situation which is easily verified with the help of social media.

For the same reasons, in time, the reality of the situation seems to highlight that there is a lot to be done; complementing, supporting, training, until the very harsh reality of this population can be transformed on an expanded scale, and with lasting effect and sustainability.

The concept of the beneficiary company in Honduras seems to have a bias [considering the limitations of the information received in this regard] similar to the concept of 'cooperatives' in Brazil. The company received support and investments in equipment, supplies, infrastructure, training, and technical assistance; obtained institutional enforcement, achieving positive results after a short implementation time. It might be interesting to either confirm or deny this evidence to promote advances towards institutional structures that are more advantageous to family farming collectives.

Regarding the specific criteria, two of them could not be identified in the data received, that is, whether the experience was agrobiodiverse and socio-biodiverse. Honduras is a markedly biodiverse country, with ancient traditional peoples who are sources and holders of knowledge about the dynamics of nature in close harmony. Unfortunately, these factors were either discrete or absent in the description of the experience.

The recognition of these facts means that the Projects have a lot of room to greatly enhance strategies in which such riches may act in favor of the respect for the environment, integrating processes, practices, techniques, and local knowledge that result in different and/or adapted means of cultivation and harvest, as well as their interactions, so necessary to simultaneously support the key functions of ecological and agricultural systems.



Microirrigated field, Honduras. Source: iDE.



Biological fumigation. Source: iDE.

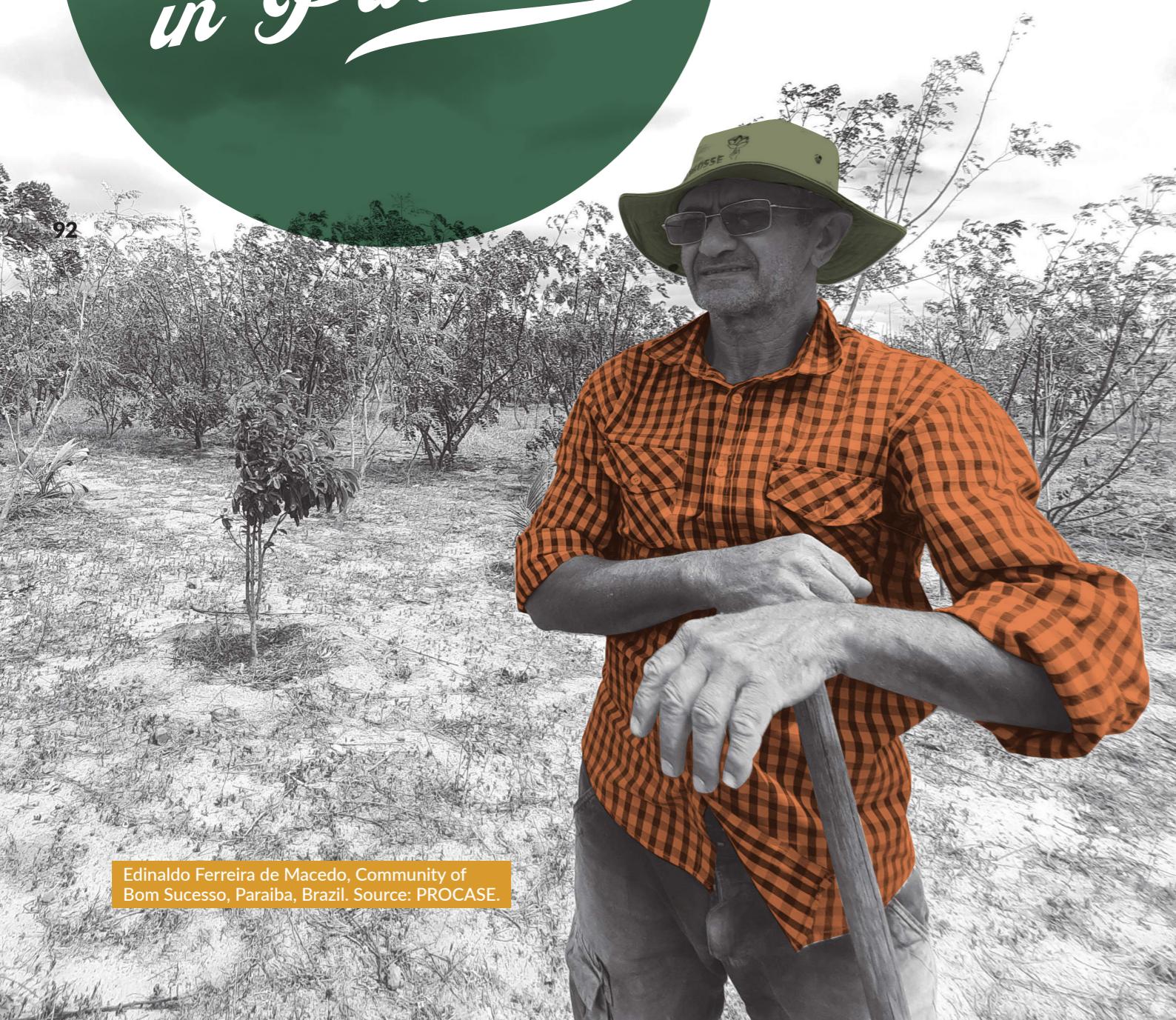
The experience in Honduras seems to attend to all requisites demanded for the association of the territory's natural diversity with planning and practices based on climate intelligence, restoring and/or valuing the dynamics and complexity of the relationships between human societies, cultivated plants, and the environments in which they live, effectively reflecting on policies for the conservation of cultivated ecosystems, the promotion of food and nutritional security for human populations, social inclusion, and sustainable local development.

GOOD PRACTICE 3

Agroforestry systems in Paraíba

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Edinaldo Ferreira de Macedo, Community of Bom Sucesso, Paraíba, Brazil. Source: PROCASE.

The PROCASE

Project for the Sustainable Development of Cariri, Seridó, and Curimataú – PROCASE is the result of a partnership between the Government of the State of Paraíba and the International Fund for Agricultural Development (IFAD), through an agreement signed on October 17, 2012, with a global value of \$ 49.6 million where 50% of the resources would come from IFAD, and the other 50% from the State Government, PRONA, and other beneficiaries and partnerships.

The Project aims to contribute to a sustainable rural development in the semi-arid of Paraíba, reducing the current levels of rural poverty and strengthening actions to confront and combat desertification.

In many ways, such actions rely on support for rural enterprises, seeking to strengthen production in already consolidated production chains, expanding, or in which there are strong growth indicators.

The actions covered by PROCASE range from events or training courses for women and young people to the strengthening of productive activities, with financial resources destined to support and foster new or already consolidated rural, agricultural, and non-agricultural enterprises.

Such actions include goat/sheep herding, cashew, and sisal farming, agribusinesses, handicraft, small-scale mining, associative and cooperative ventures, and other activities linked to the new ruralities established from local dynamics, so that such support seeks to progressively, permanently, and sustainably strengthen the rural economy and social management of the enterprises.

PROCASE aims to sustainably improve agricultural and non-agricultural income, productive assets, organizational capabilities, and environmental practices in the poorest rural areas of the semi-arid of Paraíba.

The Project's specific goals are:

- Developing human and social capital, supporting the technical and vocational training of young people.
- Improving agricultural and non-agricultural production, gaining access to markets and organizational capacities for family farmers, artisans, small miners, and rural entrepreneurs.
- Combating desertification and promoting the sustainable management of natural resources, especially in actions for the preservation and recovery of the Caatinga, including the dissemination of agroforestry systems and the exchange of knowledge and experiences related to coexistence in the semi-arid.
- Strengthening the institutional framework of the territories in the area covered by the Project, through the reinforcement of technical assistance and training of councils, forums, and organizations with the power to contribute to the improvement of management in local development and implementation of PROCASE objectives.

O PROCASE atua em 56 municípios localizados em cinco territórios do semiárido paraibano com os piores índices de desenvolvimento econômico e social, em uma macrorregião onde a probabilidade de secas é acima de 90%.

Para atuação do Projeto, foi considerada a dinâmica territorial já existente, compreendendo os Territórios de Cidadania e Territórios de Identidade, o que facilitou a participação da sociedade organizada, o controle social e o fluxo das ações a serem implantadas, a saber:

Cariri Ocidental ~ Amparo, Assunção, Camalaú, Congo, Coxixola, Ouro Velho, Parari, Livramento, Monteiro, Prata, São João do Tigre, São José dos Cordeiros, São Sebastião do Umbuzeiro, Serra Branca, Sumé, Taperoá, and Zabelê.

Cariri Oriental ~ Alcantil, Barra de Santana, Barra de São Miguel, Boqueirão, Boa Vista, Cabaceiras, Gurjão, Caraúbas, Caturité, Riacho de Santo Antônio, São Domingos do Cariri, Santo André, São João do Cariri, and Soledade.

Curimataú ~ Algodão de Jandaíra, Arara, Baraúna, Barra de Santa Rosa, Cuité, Damião, Frei Martinho, Nova Floresta, Nova Palmeira, Picuí, Remígio, and Sossego.

Seridó ~ Cubati, Juazeirinho, Olivedos, Pedra Lavrada, Pocinhos, Seridó, and Tenório.

Médio Sertão ~ Junco do Seridó, Salgadinho, Santa Luzia, São José do Sabugi, São Mamede, and Várzea.

PROCASE's institutional environment involves institutions of the Government of the State of Paraíba, the Federal Government, city halls in the project's area of the operation, official banks, organizations of family farmers and rural family entrepreneurs, non-governmental, and private organizations.

Productive investments and technical assistance and rural extension services were financed for groups of family farmers and rural family entrepreneurs, organized in community associations or cooperatives which carry out at least one relevant activity in an associative manner (production, marketing, procurement, or processing).

Agroforestry System, Bom Sucesso Community, Paraíba, Brazil. Source: PROCASE.



Considerations on desertification in the state of Paraíba

Paraíba is split into four mesoregions: The Coast, Agreste, Borborema, and the Outback. Each of them comprises landscapes with distinct characteristics in terms of ecological (geological, geomorphological, climatological, hydrological, and pedological) and biological potential factors through their flora and fauna, as well as socioeconomic and cultural factors.

Desertification is a process of land degradation that occurs in arid, semi-arid, and dry sub-humid regions around the world. In the Brazilian Northeast, climatic conditions and especially intense evaporation, low rainfall, and land use, together with the lack of efficient public agricultural policies, contribute to increasing the risk of desertification.

86.6% of Paraíba's territory is comprised of semi-arid areas, and, therefore, suffers from the temporal and spatial irregularity of rainfall which leads to the socio-economic imbalance in the region.

The area corresponding to the semi-arid is characterized by arboreal-shrubby vegetation adapted to the region's climate, with many thorns that allow for the retention of the humidity of the plants. Thus, many cactuses and bromeliads are present among the physiognomic and floristic variations of the Caatingas.

An impermeable crust is a common characteristic of deforested and eroded soils, which compromises the potential for water infiltration and facilitates surface runoff and erosion. In this scenario, "certain areas' natural conditions, such as their geoecological pre-disposition and strong climatic rigor, among other aspects, both condition and stimulate the development of the desertification phenomenon" (Ab'Saber, 1977).

Brazilian areas susceptible to desertification were determined according to the guiding assumptions of the United Nations Convention to Combat Desertification — UNCCD, which proposes the adoption of the aridity index, based on the climate classification.

Brazil does not comprise arid areas among the climatic regions covered by the UNCCD (arid, semi-arid, and dry sub-humid). A third category was added to the so-called Areas Susceptible to Desertification — ASD, those surrounding the dry semi-arid and sub-humid areas. The reason for their inclusion is justified by the fact that they present characteristics common to dry semi-arid and sub-humid areas and due to the frequent occurrence of droughts and enclaves in the typical vegetation of the Brazilian Semi-arid, namely, Caatinga.

According to INSA, desertification cores in the Brazilian Semi-arid comprise an area of 26,44 mi² across five states: Paraíba, Ceará, Rio Grande do Norte, Pernambuco, and Piauí.

These places have already reached such high levels of degradation that they are now compared to deserts — natural ecosystems characteristic of arid zones.

According to the classification of the Ministry of the Environment, of the 59 municipalities within the perimeter, 28 are located in the Seridó nucleus, in Paraíba.

Another critical area in the state are the Cariris. 29 other municipalities in Paraíba are inside Areas Susceptible to Desertification (ASD), 12 of them in Cariri Oriental and 17 in Cariri Ocidental.

Since 2010, drought has contributed to the expansion of Areas Susceptible to Desertification. The surrounding areas have been increasing in recent years and, with them, a significant leap can be achieved in areas of very heavy and heavy degradation in the coming years.

Apart from the soil, desertification can also affect the capacity of rivers and dams. With the deforestation of the riparian forest, the infertile soil layer which is scraped ends up deposited in areas with water bodies.

The sand deposited on the São Francisco River has reduced its flow in some points, while the surrounding areas are being deforested. Desertification can affect the river's health. There is a direct relationship. This takes time and will not happen in a single night, but it's already taking place. The deposit of sand in the Boqueirão reservoir is significant, compromising the volumetric capacity of the reservoir.

The desertification process is slow and starts with the deforestation of an area. This deforested space is abandoned or occupied with pastures and extensive livestock farming. As a result, the soil is further exposed to sun, water, and wind damage due to the extraction of the forest and its replacement by undergrowth, which is often inadequately manipulated.

As a result, the soil becomes more susceptible to erosive agents and loses its capacity to absorb water and nutrients, triggering a greater surface runoff. Thus, large amounts of soil are taken away, silting rivers and dams until the soil finally reaches the oceans.

The last step is the loss of soil fertility and productive capacity. After that, the land stops producing food, the atmosphere dehydrates and heats up, making rainfall scarcer, the water reserves deep in the soil decrease, springs stop running, and the rivers become intermittent.

From a socio-economic point of view, family income and food availability are gone. Without income and food, social conditions in the affected areas deteriorate. There is food insecurity and more vulnerable health. The families are subjected to material and spiritual impoverishment. Soon, people run away. (...)

FIGUEIREDO, Vânia Santos. Perspectivas de recuperação para áreas em processo de desertificação no semiárido da Paraíba — Brasil Scripta Nova. Revista Electrónica de Geografía y Ciencias Sociales. En línea. Barcelona: Universidad de Barcelona, 10 de octubre de 2013, vol. XVII, nº 453. <<http://www.ub.es/geocrit/sn/sn-453.htm>>. ISSN: 1138-9788.

Experience summary

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IDENTIFICATION INFORMATION	
Practice title	AGROFORESTRY SYSTEMS (AFS)
Location	Brazil/Paraíba PROCASE Regional Management Units – URGP (subterritories): Seridó, Médio Sertão, Cariri Ocidental, Cariri Oriental, and Curimataú.
Summary	Carry out reforestation through the implementation of Agroforestry Systems in the territory of the state of Paraíba, seeking to link benefits to the environment and the local community.
What makes it a good practice?	By providing social, economic, and environmental improvements to communities, improving the use of the area by integrating the production of food, wood, medicinal plants, forage, bee farming, and, above all, promoting food security for those involved, as well as the generation of income, in addition to providing soil conservation and conveying valuable knowledge about sustainability.
Organization's focal point	PROCASE
Documents dated from	2018 to 2020
Focal point	Thiago Cesar Farias da Silva PROCASE Environmental Consultant MSc. in Biological Sciences with an emphasis on Zoology
Email	thiago.procase@gmail.com
Mobile	Celular: +55 83 98844-8612 / +55 83 99939-0834
Address	BR 230 Cabedelo, km 14 s/n Estrada de Cabedelo- Cabedelo - PB - cep 58102-542
Practice's URL	https://www.procase.pb.gov.br/oprocase http://portalsemear.org.br/fida/projeto-procase-paraiba/

DETAILED DESCRIPTION OF THE PRACTICE

Context and rationale	PROCASE's main reference is the emergency in the Desertification Belt in Paraíba, proportionally, the Brazilian state which is most affected by desertification; a process of environmental degradation that rends land infertile and unproductive as a consequence of human action, and that cannot be reversed – not even with the help of rainfall – just slowed down. According to the classification of the State Action Program to Combat Desertification and Mitigate the Effects of Drought in the State of Paraíba – PAE-PB, based on the UN Convention on Desertification, 93.7% of the state's territory is in the process of desertification, with 58% at a high level of degradation. Desertification is a cumulative process of environmental degradation, affecting the economic and social conditions within a region or country. At the same time, as it continuously leads to a decrease in the surface of arable land, it causes the population affected to move into new territories to survive. PROCASE based its experiences on the PAE-PB and National Institute for the Semi-Arid's – INSA – research. The agricultural practices that have been in place for decades, the rudimentarily cultivated fields, with burnings and no covering are among the biggest issues in the rural area of the regions served by the Project. The reductionist view of the environment was/is the most common perception among groups that promote/promoted the inappropriate use of land. There are the "roças" (small plantation fields), which serve as occasional and small productions close to the homes. The areas usually measure 3-5 ha, with 10-15 ha plots being quite rare. These are subsistence crops, with one of the most common being Barbary fig plantations. At the beginning of PROCASE, there was the introduction of a palm variety resistant to the carmine scale (<i>Dactylopius opuntiae</i>) that had been devastating the produce until that point in time. One of the most important issues encountered by PROCASE is the conversion of native areas into pastures. The regional livestock culture includes three main species – cattle, sheep, and goats. The trend is usually keeping all three simultaneously, in a rudimentary context, but with different purposes. Cattle are kept for commercialization and quick liquidity; while sheep and goats serve the local market and provide food security for the families.
What is the issue being addressed?	Reducing the negative impacts caused by the conventional agroforestry production method on the environment.
Affected population	Mostly rural communities and also the urban populations from municipalities whose economy is biased towards agroforestry production.
How is the issue impacting the population?	Low productivity of agricultural activities as a whole, increasing poverty and extreme poverty across the populations, an ongoing process of desertification.

Objectives to be achieved	<p>AFS as part of the recovery strategies of degraded areas with a history of bad agricultural practices, aimed at:</p> <ul style="list-style-type: none"> • Promoting the recovery and/or conservation of the available natural resources; • Empowering the farmers involved through knowledge multipliers; • Disseminating the technique in the area; • Incorporating trees into production systems; • Optimizing the beneficial effects of the interactions that occur between trees, crops, and animals; • Providing an improvement in productivity and production maintenance; • Promoting the recovery and/or conservation of the available natural resources; • Reducing the negative impacts caused by the conventional agroforestry production method on the environment.
A. Proposed topics related to the experience:	
AGRICULTURE	(x)
WATER	(x)
TRAINING	(x)
FOREST	(x)
GENDER	(x)
YOUNG PEOPLE AND TEENAGERS	(x)
CLIMATE CHANGE	(x)
LIVESTOCK	(x)
SOIL	(x)
SOCIAL TECHNOLOGY	(x)
B. Best practice categories that apply to the experience:	
ENVIRONMENTAL RECOVERY	(x)
SUSTAINABILITY	(x)
REPLICABILITY	(x)
C. Biome where the practice is applied	Caatinga.
D. Local/regional environmental situation where the practice applies	Heavily degraded and polluted
E. Rainfall regime in the region	Scarce rainfall, amounting to less than 300 mm/year in some areas.
F. Has a change in the rainfall regime been observed within the practice area?	Less rain than historical averages. There was a major drought between 2012 and 2017.
G. Do women, young people, native people, traditional communities, and quilombolas participate in the proposed practice?	Women, young people, and traditional communities participate in the proposed practice, although the data are not included in the AFS's technical reports, only in reports related to gender and whose data were not accessed during the consultation

TECHNICAL DESCRIPTION OF THE PRACTICE

Larger project summary

PROCASE's goals are:

Promoting the sustainable management of natural resources, including techniques and knowledge to support the fight against desertification. Improving the support capacity of rural institutions.

Developing and executing rural development policies and projects in the semi-arid of Paraíba.

Promoting the development of the rural economy in the semi-arid of Paraíba and reducing the poverty levels of rural families.

The AFS was planned, although without an implementation method, resulting in the construction of a methodological path through syntropic agriculture combined with the Sobral model (EMBRAPA), generating an adaptation that was finally used successfully.

The project can be applied in the realities of a productive backyard or the situation of irrigated Barbary fig plantations. The use of Saltbush as intercropping, Moringa, and Gliricidia.

A state-of-the-art model, with a localized water source, community training, and guided by the syntropic concept.

The use of the structure installed in the properties and community relations was a relative advantage.

*How was the practice selected or designed?**Local and regional opportunities and restrictions*

According to the Project Implementation Manual, there is the guidance and need to involve all potential participation entities, communities, community associations, technical assistance (technicians and contractors, equipment, supplies, AFS execution, training, monitoring), municipal governments, and government companies (EMATER).

PRACTICE IMPLEMENTATION

<i>Main activities performed</i>	Planting of native and fruit-bearing seedlings; innovation, with the transfer of the syntropic agriculture methodology for semi-arid environments; training of farmers, representatives of municipalities, unions, and local organizations.
<i>When and where were the activities carried out</i>	Cariri (Oriental and Ocidental), Curimataú, Médio Sertão, and Seridó between 2017 and 2018.
<i>Main implementers and collaborators</i>	Forest Company, beneficiaries, City Halls and Trade Union Associations, Technical Assistance and Rural Extension entities (TARE), and PROCASE technicians (contractors and public servants)
<i>Use of resources</i>	Two contracts (implementation and implantation) totaling approximately BRL 380,000.
<i>Regulations, values, and culture considered in the project for the implementation of the practice</i>	Consideration and recognition of the knowledge of the participating communities, as the Creole seeds, for example. Ideas, culture, and thoughts were incorporated in the implementation of the AFS, finally generating its own condition, together with peculiarities.
<i>Unexpected or negative results of practice implementation</i>	Subproject implementation could have been more fluid, incorporated in the context of PROCASE's macro activities. There were cases in which the AFS implementation initiative lost motivation and had to be rescued.
<i>Tipo de estrutura:</i>	
Private	(x)
State government	(x)
Municipal government	(x)
International organization	(x)
Non-governmental organizations	(x)
<i>Main activities targeted at implementation</i>	Mandatory involvement of regional PROCASE entities, providing logistical and institutional support for the legitimization of actions, the relationship between technicians and farmers to ensure fairness of treatment, contract auditor (measurements, payment synchronicity, and maintenance of the continuity of current actions).
<i>Target groups reached through the practice to ensure equity is considered</i>	This experience lacks the target groups to ensure equity is considered. The experience was based on communities interested in the conceptual model, without necessarily focusing on the specific target audiences (gender, youth, etc.), even so, several AFS ended up graduating with women and young people.
<i>If Brazilian, the good practice is aligned with the National Environmental Policy or the National Climate Change Policy and their current priorities and/or, in the case of international experiences, with other international frameworks on climate change, such as the Paris Agreement*?</i>	The practice is not in line with the National Environmental Policy or the National Climate Change Policy and their current priorities. Its applicable legal basis is the National Policy to Combat Desertification and Mitigate the Effects of Drought, Law No. 13,153 of July 30, 2015.

The practice employs the main local agents or partners capable of carrying it out without the need of technical support from PROCASE, that is, AGROFORESTRY SYSTEMS have already achieved an important level of autonomy for the continuity of the AFS production, without necessarily requiring technical assistance.

Beneficiaries are fully equipped to expand the implemented AFS. Some communities that did not receive the AFS have added the knowledge and concepts of syntropic agriculture they absorbed in their practices, applying them in their conventional crops.

Regional offices are available, with the presence of technical and financial supervision; there is the social mobilization of the beneficiaries to collectively assess the advances and challenges faced by the groups; meetings in loco are organized to monitor the implemented actions processes and share accessible management information.

Does the project have mechanisms for reviewing, sharing progress, and incorporating new learning into the implementation process?

Visits with management assessment questionnaires and remediation of issues such as fences, including the provision of the supplies necessary to protect the AFS.

Is there a political commitment to implement this practice?

This process is still under construction, as local governments and/or the state should assume the practice by institutionalizing it, which is not the case for the time being.

CONSIDERATIONS BEFORE EXPANSION

Is there an understanding among the donors and key stakeholders about the relative advantage and outcomes of the practice to ensure ongoing commitment to support – e.g., financial?

There is no known understanding among the sponsors and key stakeholders about the relative advantage and outcomes of the practice to ensure ongoing commitment to support.

Was there a cost assessment done to plan for expansion and sustainability?

There was no cost assessment carried out to plan the expansion and sustainability of the practice. The budgets and costs of actions are linked to the Project, with no forecast for resource expansion beyond what has been scheduled. There are ongoing negotiations for a new stage of PROCASE, so it is possible that some of the actions could be either resumed, increased, or expanded.

Results obtained

31 AFSs implemented in the regions of Cariri (Oriental and Ocidental), Curimataú, Médio Sertão, and Seridó between 2017 and 18. Small producers have access to technical assistance and financial resources to improve agricultural and non-agricultural production. More than 10,000 families confirm there have been productivity improvements at their properties. Increased income, production volume, and valuation of products sold based on the benefits received. 225 hectares of Caatinga under good natural resource management practices. Family producers participating in territorial meetings and assemblies. The families report the adoption of supplies, practices, new, or improved technologies.

Practice evaluation method and results

The evaluations are based on the goals achieved in the Logical Framework and the progression of the activities' work plans, carried out by the specific technical reports. Considering the results, the values accumulated by the component receiving the AFS indicate 187% positivity.

Practice general results

899 producers trained
899 systems, including implemented Innovation with Crops, Livestock, and Forest Integration – CLFI in intercropped Barbary fig plantations, agroforestry systems, productive backyards, aquaponics systems, among others.
Around 12 thousand families received technical assistance and rural extension.

General Criteria Evaluation

CRITERION	DESCRIPTION (Descriptive report of the action)	ITEMS CHECKLIST	COMPLIANCE WITH THE YES/NO CRITERIA
	<p>PROCASE's main reference is the emergency in the Desertification Belt in Paraíba, proportionally, the Brazilian state which is most affected by desertification; a process of environmental degradation that rends land infertile and unproductive as a consequence of human action, and that cannot be reversed – not even with the help of rainfall – just slowed down.</p> <p><i>Framing of the practice within the subject of confronting climate change.</i></p>		<p>The classification of the State Action Program to Combat Desertification and Mitigate the Effects of Drought in the State of Paraíba – PAE-PB, based on the UN Convention on Desertification, 93.7% of the state's territory is in the process of desertification, with 58% at a high level of degradation.</p>
	<p><i>The framing of the practice within the implementation time, preferably with a minimum of 2 years of execution, considering the time needed for the gathering of all other parameters described by the consultancy analysis while ensuring its genuine integration with the local reality.</i></p>	<p>Results are described from 2019 onwards in PROCASE's Logical Framework.</p>	<p>Documents dating from 2018 to 2020</p>

(X) Suitable for evaluation regarding the general criteria. () Disqualified (marked NO in at least one of the general criteria)



Specific Criteria Score Analysis

GOOD PRACTICES IN THE COMBAT OF CLIMATE CHANGE

ANALYSIS		
CONDITION	EFFECT	SCORING SCALE
<i>Did not submit any verification items</i>	Disqualified: does not meet the criteria.	0
<i>Presented at least 2 verification items</i>	Qualified: minimally meets the criteria	5
<i>Submitted more than two verification items</i>	“Good practice”: largely meets the criterion	10

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Scoring by Specific Criteria

CRITERION 1	IS THE RESULT OF A PARTICIPATORY PROCESS	POINTS ACHIEVED
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
<p>The Productive and Organizational Strengthening Plans will be drawn with the direct participation of family farmers and rural family entrepreneurs who carry out activities associated with the predominant productive arrangements in the territories and participate in associative organizations or cooperatives with little organizational experience for production. They must meet the needs of productive groups to strengthen and improve the levels of production organization, as well as the technical and management capacities of small rural businesses, enabling their insertion in the predominant productive arrangements across the territories where the Project operates. For the preparation of the Plans, the productive groups will have the support of technical assistance and rural extension technicians from EMATER-PB, as well as other organizations and specialists with technical experience in the area.</p>	<ul style="list-style-type: none"> 1. The project's partner agency team, municipal representatives, and producer organizations support 27 working and training meetings on issues related to local and territorial development methodologies, local governance, and social participation. 2. Five regional offices were created and installed. 	10
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
<p>The AFS was planned, although initially without an implementation method, resulting in the construction of a methodological path through syntropic agriculture combined with EMBRAPA's 'Sobral' model for goat and sheep farming, generating an adaptation that was finally used successfully.</p>	<ul style="list-style-type: none"> 1. Incorporation of trees into the production systems. 2. The project can be applied in the realities of a productive backyard or the situation of irrigated Barbary fig plantations. The use of Saltbush as intercropping, Moringa, and Gliricidia. 3 Optimization of the beneficial effects of the interactions that occur between trees, crops, and animals. 	10

GOOD PRACTICE 3

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REDUCES THE RISK OF DISASTER/CRISIS		
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
The experience values biodiversity and the economic potential of wood and non-wood products, creating natural capital to fight the climate challenge with social gains using, for example, forest restoration with native species.	<ul style="list-style-type: none"> 1. 13 communities with implemented agroforestry systems. 2. Family farmers apply productive projects based on techniques and knowledge to support the fight against desertification. 3. Strengthening of the forest restoration production chain. 	10

EFFECTIVE AND SUCCESSFUL		
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
The planting of native forests generated employment and income in rural areas, contributed to recovering the soil and regulating water (with gains in quality and quantity), besides providing products such as wood, fruits, oils, essences, nuts, and others, reducing the pressure from deforestation and extraction of native forests for conservation and preservation.	<ul style="list-style-type: none"> 1. Rural extension institutions assist the beneficiary families 2. Small producers receive financing to advance their AFS ventures. 3. Family farmers develop collective actions and business plans related to AFS production. 	10

REPLICABLE AND ADAPTABLE		
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
Ideas, culture, and thoughts were incorporated in the implementation of the AFS, finally generating its own condition, together with the peculiarities of the semi-arid.	<ul style="list-style-type: none"> 1. Agricultural and livestock technologies and techniques widely shared by the beneficiaries. 2. Some communities that did not receive the AFS have added the knowledge and concepts of syntropic agriculture they absorbed in their applying them in their conventional crops. 3. Beneficiaries are fully and autonomously equipped to expand the implemented AFS. 	10

SOCIOBIODIVERSE		
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
The experience covered 13 different communities, including a significant range of different types of beneficiaries living together in the context of the proposal in the semi-arid. Another element is that part of the species that make up the AFS are native to the Caatinga.	<ul style="list-style-type: none"> 1. Seeds are essential selection and origin components to compose the AFS. 2. The implementation of production systems suited to the regional conditions and taking into consideration the climatic, social, economic, and cultural aspects. 3 Irrigated Palma fields to be enriched by AFS. 	10
CRITERION 7	AGROBIODIVERSE	
NO DESCRIPTION	NO VERIFICATION ITEMS	NO POINTS ACHIEVED
CRITERION 8	PERMEATED BY GENDER AND YOUTH ISSUES	
DESCRIPTION	ITEMS CHECKLIST	POINTS ACHIEVED
This experience lacks the target groups to ensure equity is considered. The experience was based on communities interested in the conceptual model, without necessarily focusing on the specific target audiences, even so, several AFS ended up graduating with women and young people. In its Implementation Manual with these explicit recommendations.	<ul style="list-style-type: none"> 1. AFS cases formed entirely by women and/or young people. 2. Training focused on gender and youth interests and characteristics. 3. Promotion of meeting events, workshops, and exchanges that consider gender and/or youth equity. 	10

Total Specific Criteria Score

TOTAL SCORE OF THE ACTION ON SPECIFIC CRITERIA:

70 points

Evaluation result for the action:

(X) Qualified () Disqualified

110

Preparation of the hydrogel solution. Source: PROCASE.



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Comments

Agroforestry Systems proved to be a grand, surprising experience due to the set of activities that arise from an innovative and integrative methodology combining two pre-existing strategies, which together and adapted to PROCASE, had a synergetic effect. Synergy has been one of the keys to the success of the experience with agroforestry systems: syntropic agriculture and the EMBRAPA's Fazenda Sobral model.

Part of the challenge in combating the desertification process is creativity and the ability to adapt to the most diverse field situations, types of beneficiaries, and territorial identities that may or may not be stimulating factors for the proposals.

Other essential qualities involve the simultaneous use of courage, patience, and persistence. Those qualities are not easily found. However, these would be some of the characteristics which could not be formally translated into quantitative results and accounted for by international projects monitoring mechanisms, with goals and indicators designed for efficiency and effectiveness.

We could still mention the word 'effectiveness', and perhaps it carries the heaviest meaning: to generate cultural changes, and, in the case of desertification, those changes symbolize the life and [literal] death of a place.

Just dive a little deeper into the concept of desertification. It comes from two Latin words: "desertum" adjunct past participle of the verb "deserere" (to desert, leave, abandon), meaning abandoned, uninhabited, uncultivated, wild; and "desertus" noun meaning solitude, desolation, empty area, plus the English verb suffix "fication", from the passive form of the Latin verb "ficare" (ficeri), the action of making, to be produced.

Facing desertification is not unexpected.

What the AFS experience brought, in addition to its innovation and exemplary execution, seems to be the courage, patience, and persistence in giving the people and communities served the inspiration to change, whatever the costs, such as permanently abandoning habits, technical assumptions, and philosophical-political attitudes incorporated in the way they perceive their world, work, and actions.

All of this is part of the identity framework that is also an ancestral part of this great tragedy. It is very dear for any native countryman to imagine that his references to living in Caatinga are/were wrong in several respects.

Changing reality is not hard to foresee.

Thus, by proposing to delve into this universe of the experience of agroforestry systems, this study was able to subtly resume with a glimpse of what the largely forested environment of the Caatinga would have been in this place where poverty dominates in almost every sense today. This seems quite significant, given the perplexity and radical nature of desertification.

Therefore, Brazil can greatly benefit from the value of continuing the various integrated actions involving technical, social, economic, and envi-

ronmental empowerment for strengthening humanity in each and every one; after all, intrinsic humanity is the most fundamental basis for the confrontations ahead of us.

Considering that, as a criterion of good practice, one of the "weaknesses" involved the idea of the practice being 'Agrobiodiverse', two actions that may prove relevant in PROCASE's next phases are the creation of conservation areas in Caatinga, whose biodiversity would allow for the extraction of drugs and the making of products from many production lines, technological, and economic innovation.

Allied to the first, the second idea would be a step back in terms of the exploitation of plants rich in molecules of interest, that is, bioprospecting – the exploitation of the genetic and biochemical resources of species, especially by the pharmaceutical industry.

With the creation and implementation of robust public policies to and for the conservation of the Caatinga, it would also lead to the encouragement of tourism, the creation of companies, whole new production chains, attracting research and public investments of other natures.

All are value-added to a strong and protected forest, while contributing to the elimination of the locus regions of both poverty and degradation, lacking autonomy and secularly dependent on external resources, whether domestic or foreign, to the holder of wealth, making them the subject and motive of their own history. Practices with the AFS are actual seeds of prosperity.

Moving on to the more specific technical aspects of the practice, the importance of providing continued resources to create conditions favorable to the implementation of mechanisms of information, financing, society involvement, and monitoring is well-known; an item applied to the specific criteria more complexly related to sociobiodiverse practices, which also showed less clarity in its approach through the present process of systematization.

Besides increasing the families' food supply, and the one available for sale, in the context of the Caatinga, the Sobral model for goat and sheep farming also provides an increase in the supply of forage throughout the year, especially during the dry season.

The production model also allows for the sustainable use of natural resources, with the maintenance of tree species across the areas, increasing the circulation of the nutrients, and improving their contribution to the soil.

Maintaining this organic matter in the area protects against erosion and improves soil biology. The model advocates for the protection of springs, riparian forests, and Areas of Permanent Preservation, with a reduction in water loss through the soil, as well as avoiding the use of pesticides and fires.

Production systems for goat and sheep farming are essential to the sustainable development of the regions inserted in arid and semi-arid areas, since, within those environments, the risks of failure with agricultural activities are greater due to the dependence on climatic factors.

Crop, livestock, and forest integration – CLFI is a production strategy that has been growing in Brazil in recent years and used by PROCASE, al-

AFS from Bom Sucesso Community, Municipality of Sossego, Curimatau, Paraiba, Brazil. Source: PROCASE.



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though with less visibility given the focus on AFS. It is a concept that encompasses integrations between agriculture, forestry, and/or livestock. Long before this concept, integration practices between agriculture, livestock, and forestry were already carried out in the Brazilian Semi-arid.

The research found that integration provides considerable savings in the application of herbicides, mowing, and weeding, equivalent to 4 to 8% of the cost of fruit production, for example.

This production model also contributes with a good amount of the manure to be applied in the fields, since, at night, the animals are collected in pens. Other advantages are the optimization of labor on the property, the increase in the efficiency of land use, the mitigation of environmental issues arising from the application of herbicides, and the promotion of another source of income for the property.

In other words, there is the understanding that AFS actually comprises a menu of technologies which, together, are powerful instruments to change [or, with the intention of changing] reality with a wealth of concrete support tools for those who accept to do so.

We hope that the lessons learned from AFS will bring awareness to the fact that trees need to be planted now, cared for now, to also fulfill their role in curbing desertification processes and mitigating climate change.



Seedlings for vivariums, Riacho do Sangue Community, Barra de Santa Rosa, Paraíba, Brazil. Source: PROCASE.

Gt is important to note that this experience is peculiar if compared to others. As a practice, PROCASE provided the material it managed to obtain. The crossroads was set with the research; there were few conditions to gather formal content to the point of enabling the application of the proposed systematization methodology.

On the other hand, as the contact with PROCASE intensifies, details on the practice emerge, bringing a new perception about its quality to the light, as long as it was treated differently, thus validating the oral content taking place.

Thus, we preferred to carry on with this experience's systematization, as it translates into an effectively significant potential in the context of the continuity of its realization by PROCASE 2 (second stage of PROCASE, under planning process), however, in a quite distant situation from the one it gave rise, as shown below.

The experience was included in the study with the belief that the exercise of its synthesis, with comments arising from the statements received, will eventually be accepted as a potential good practice.

Experience identification information

Title:	VIVARIUMS
Location:	PARAÍBA – BRASIL Project Regional Management Units – URGP (subterritories): Seridó, Médio Sertão, Cariri Ocidental, Cariri Oriental, and Curimatau
Organization	PROCASE – Paraíba, Brasil.
Documents dated from	2018 to 2020
Focal point	Thiago Cesar Farias da Silva PROCASE/IFAD Environmental Consultant MSc. in Biological Sciences with an emphasis on Zoology
Email	thiago.procase@gmail.com
Phone	+55 83 98844-8612 / +55 83 99939-0834
Address:	BR 230 Cabedelo, km 14 s/n Estrada de Cabedelo - Cabedelo - PB - CEP 58102-542
Practice's URL:	https://www.procase.pb.gov.br/ http://portalsemear.org.br/fida/projeto-procase-paraiba/

Within the scope of the projects implemented by PROCASE with its beneficiaries, "Vivarium" was initially just an unformatted kind of counterpart. In other words, each community benefiting from PROCASE would have to introduce a 'plant nursery' implemented in their own way, without necessarily having a specified function or objective.

We could also observe that there were two strands of understanding within PROCASE, one implied that the structures were nothing but accessories to the projects; and the second, that the set of nurseries would eventually form a network across the thirteen agreements established up to that moment.

The nurseries built did not rely on an executive starting project, any specific dimension, or even a clear objective. There were contracts with different nursery proposals, based on informal and non-professional executive projects.

They were devices that emerged at different times in the communities, made of different materials, to the point that raves began to occur, such as the implementation of nurseries without access to water, for example. Without due diligence by the contracted companies, they were delivered to the communities without technical rigor, leading to many cases of rapid structural depreciation and losses of initiated productions.

It was evident that an effort was made without a practical sense for the communities, which only complied with a formal item of the agreements. There was, therefore, a strong rejection of the proposal, thickened with reports of damage, dissatisfaction, and lost enthusiasm.

The conceptual dispersion of the proposal, its technological failures, constant abandonment, dropouts, and the pressure from the communities (and managers) to review its continuity, made it very difficult for the technical team to deal with the issue. Such was the situation in 2016.

However, without giving up in front of the proposal's lack of popularity, in 2017, after dealing with the Project's management difficulties, the idea for the nurseries was back on the table, this time, structured on a concept that would only advance if the community manifested interest in the topic.

The resuming of the nurseries, however, would take place on other bases; gradually and as far as there were cases of success to reference future next attempts, also taking the different realities of the communities involved into consideration.

PROCASE researchers went in search of training to better deal with the challenge of overcoming the conceptual void on the construction of nurseries, their objectives, and technique.

They visited reference nurseries and learned about their potential as potentially advantageous ventures if commercially or technologically applied to the conditions of the Caatinga and the territory covered by the Project.

To take advantage of the high investment made so far, the understanding of the 'concept' of nurseries expands when one realizes that they should necessarily be designed with productive purposes independent from those of PROCASE.

An analysis of the typologies of nurseries was carried out to create projects that could be better aligned with a customized purpose for each case, and the supply of species seedlings that could serve the direct interests of the Project (agroforestry systems, backyards) became evidently productive.

It was immediately possible to mobilize three contenders for the position of nurserymen (two community leaders and one young man) from the communities of Riacho do Sangue, Riacho da Cruz, and Santa Verônica. Together with PROCASE's technical team, they went on an expedition to get to know a large nursery specializing in cacti and succulents located in the region of Vale dos Dinossauros, in the city of Sousa, PB.

Out of the three, the two community leaders were successful in the cacti and succulents nurseries venture in Riacho de Sangue and Santa Verônica, generating a significantly positive economic effect due to the demands arising, especially from João Pessoa.

With the pandemic, there was the emergence of a huge, unexpected competition, which led to a decrease in the sales of nurseries farthest from the state capital, João Pessoa, the main urban center creating a demand for the plants.

As a hypothetic justification for the situation, the pandemic caused mass unemployment, which was associated with an increase in informal work, and the expanded sale of cacti and succulents was identified as an alternative work opportunity as a result of the rising interest of the people isolated in urban centers for this type of product.

A curiosity in this regard, rural inhabitants were somewhat perplexed to find out that cacti and succulents are actually ornamental or pet plants, with promising potential for profitability.

Such species are abundant and naturalized in their coexistence with the Caatinga, even considered the object of the Project itself, as the Barbary fig (*Opuntia ficus*, original from the desert regions of northern Mexico in the southwest of the United States [Griffith, 2004]) —, one of the most produced forage species as a nutritional option — it contains a high content of non-fibrous carbohydrates, vitamin A, and iron [SENAR, 2018] —, of great relevance to the herds, are cacti. They were not aware of that.

In 2020, PROCASE once again took the initiative of fostering nurseries through the implantation of the cultivation of Saltbush (*Atriplex nummularia*, a large woody shrub, native to Australia, thriving in arid and semi-arid regions), in association with the Barbary fig plantations, to improve the feeding of the goat herds in other communities benefiting from PROCASE.

This initiative was based on research by the Brazilian Agricultural Research Agency – EMBRAPA and the experience of the Fresh Water² Program in

² The Fresh Water Program – FWP is an action of the Federal Government, coordinated by the Ministry of Regional Development in partnership with several federal, state, municipal, and civil society institutions, aimed at establishing a permanent public policy for access to quality water for human consumption, while incorporating technical, environmental, and social care in the implementation, recovery, and management of desalination systems for brackish and saline waters.

Paraíba through the Demonstration Unit of the Fazenda Mata Settlement, in Amparo, Paraíba, which provided the first Saltbush seedlings.

Since then, from a structural point of view, the Project's nurseries have specialized as endogenous and autonomous organizations perceived as an evolution in relation to the initial experience, for example, in the collective production of papaya in a nursery intended to be a repository of seedlings, and other cases, such as in commercial nurseries for the production of vegetables and ornamental species seedlings.

Currently, PROCASE's challenge is to improve the commercial and management aspects concerning the strengthening of market advice, improving the nursery activity production and formal institutionalization, which involves other types of training and instrumentalization of the beneficiaries. However, before that can take place, the strategy is bringing into the process the economic sustainability that must come together with other advances and achievements.

One of the options in this regard has been the revitalization of PROCASE's original idea of nursery networks. With that, the nurseries would shift into a networking format, like the one in Curumataú, working together with integrated production. This should concurrently lead to consortium purchases of supplies and aggregation of the individual production volumes of flowers and succulents to meet associated sales due to demands for quantities greater than the individual capacity of the nurseries.

After the pandemic, the business dynamics of the nurseries should be expanded, enrolling them to participate in fairs, creating attractive websites, and approaching markets, among other possibilities for promotion, dissemination, and specialized training.

Among the differentiated results achieved by PROCASE on the 'Vivarium' project, there is the collective work between communities previously unaware of each other, and now share interests, activities, and processes with good, unexpected results.

Another advance would be having the nursery produce an activity inherent to the family farming, while, however, avoiding the usual expectation of placing an exclusive "focus" on the production of seedlings as the main activity under the (false) presumption that families would abandon other agricultural activities and livestock to dedicate exclusively to the nurseries.

On the other hand, as a complementary activity and part of a network, the nursery could supply various restoration projects for degraded areas, legal designations such as Terms of Conduct Adjustment – TAC for enterprises, environmental compensation, fines. The idea is reaching a good frequency and consistency of demands – which are still sporadic and occasional in most cases of nurseries for native or fruit-bearing forest species.

From actions such as the recovery of degraded areas promoted by public policies, they would work together with the national Rural Environmental Registry – RER and the Environmental Regularization Program – ERP, two great novelties of the new Forest Code (Law nº. 12,651/2012) and future

Vivarium installation. Community Riacho do Sangue, Paraíba, Brazil. Source: PROCASE.



opportunities would arise, considering the extremely high degree of devastation in which Caatinga is currently found.

RER is a powerful tool for public authorities to manage land use and environmental occupation; while ERP, serves as a set of actions or initiatives to be developed by landowners and/or rural holders, to adapt and promote environmental regularization. Both changes were introduced by the Code in the articles about Areas of Permanent Preservation (APPs), the Legal Reserve (LR), and the Regularization of Properties and Penalties, adding up to a vast territory awaiting revitalization.

Finally, there is still the eminent potential of the 350 Barbary fig plantations to be converted into agroforestry systems in the coming years.

Currently, the 131 Barbary fig plantations converted into agroforestry systems have consumed around 10,000 different seedlings. The future perspective when converting the plantations is relying on the installed network of nurseries in the same region as main seedlings suppliers.

Also in this perspective, and besides the seedlings production, a second goal would be contributing to the professionalization of the nurserymen and institutionalization of nurseries, enabling the issuance of invoices and practice of production accounting, sine qua non demands for legal compliance, together with Project management and the effective advancement of the proposal.

Given the above, and regarding the proposed methodology for validating the "good practice", this experience's history did not provide information proper to a systematization based on complete and institutionalized reports, with primary and secondary data to allow for the quantification and qualification of its results, to enable its proper technical-scientific formality.

This study did not intend to assess the information without a methodological apparatus for this purpose. Regardless of more than two years of experience, the subject of climate change was not inserted as an aspect considered in its realization.

Strictly speaking, this fact would already disqualify the experience under the scope of this systematization methodology. On the other hand, the positive impact experienced by listening to the practice, its humanism, coherence, and conviction of the report imposed themselves on the formalism of the method to seize the opportunity and access better knowledge through experiences with great potential for use as "good practices".

Having accepted the mission of critically systematizing the experience, the next step is providing recommendations that could 'enable' or promote the characteristics necessary to the constitution of a good practice for the proposed concept.

Next, some tables are used, based on the analysis worksheets of the specific criteria. Recommendations/suggestions are made for the adoption of elements that, if applied, can contribute to achieving the 'good practice characteristics' assumed in this study.

In the structure of the tables, the eight specific criteria are listed in the column of vertical recommendation. Transversal and complementary objectives/actions to the vertical recommendation are proposed, as good practice, in the column of horizontal perspectives.

Recommendations for the experience

VERTICAL RECOMMENDATION DESCRIPTION: Is the result of a participatory process	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Expansion of activities and management mechanisms in decision-making on a participatory basis in the various stages of implementation and development of the nurseries. 2. Promotion through the participation of as many existing or developing organizations as possible across the communities. 3. Promotion of character processes that value autonomy, transparency, and participatory management.
VERTICAL RECOMMENDATION DESCRIPTION: Technically possible	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Wide dissemination of nursery diversity and commercial mechanisms. 2. Strengthening of research on native Caatinga species potentially reproducible in nurseries. 3. Promotion of continued technical and administrative training for nursery farmers.
VERTICAL RECOMMENDATION DESCRIPTION: Reduces the risk of disaster/crisis	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Strengthening vanguard experiences in the conservation and restoration of Caatinga. 2. Promoting the interaction of the nursery with Creole seed networks of cultivars and native species of the Caatinga. 3. Promoting the interaction/partnerships with research and conservation entities in the Caatinga.
VERTICAL RECOMMENDATION DESCRIPTION: Effective and successful	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Inclusion of metrics for the production and its distribution in both domestic and foreign markets. 2. Diversification of structures, production, and distribution. 3. Development of partnerships and networking expansion.

VERTICAL RECOMMENDATION DESCRIPTION: Replicable and adaptable	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Promotion of the wide dissemination of materials on the content of nurseries through different means of communication and pedagogical formats. 2. Creation of mechanisms for monitoring and evaluating the experiences installed by the Project. 3. Development of partnerships and knowledge exchange.
VERTICAL RECOMMENDATION DESCRIPTION: Sociobiobiodiverse	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Expansion of the research and dissemination of local knowledge about the biodiversity-related to production in nurseries. 2. Expansion of research and dissemination of ecological practices integrated into the production of nurseries. 3. Identification of native species integrated into the production of nurseries.
VERTICAL RECOMMENDATION DESCRIPTION: Agrobiodiverse	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Proposition of recovery and conservation policies for cultivated ecosystems in Caatinga. 2. Development of protocols for the production of seedlings of different arboreal species from Caatinga that can be used in open environments, regeneration, riparian forests, springs, and other Areas of Permanent Preservation (APPs). 3. Training of public managers and technical assistance agencies in nursery farming on a sustainable basis.
VERTICAL RECOMMENDATION DESCRIPTION: Permeated by gender and youth issues	HORIZONTAL PERSPECTIVES: <ul style="list-style-type: none"> 1. Valuing the perceptions of women and young people in all stages and procedures. 2. Prominence of women and young people in the project. 3. Differentiated access to resources and technical training aimed at women and young people.

Comments

Finally, this study understands that one of the possibilities created by the "Nurseries" experience and could inspire interested parties was a network of nurseries of good practices translated into becoming, either individual and/or collectively, a reference center in seedling production of forest, fruit, ornamental, medicinal, aromatic, and forage species, contributing as a didactic space for the training of new nurserymen/environmental educators with a reflection on the environmental issue, stimulating the comprehension of a systemic view of life, the Caatinga biome, the climate change, and water and energy management.

The nurseries could excel in disseminating good seedling production and conservation practices, valuing native species in the region and those adapted to edaphoclimatic conditions that contribute to environmental conservation and animal nutrition, while respecting cultural and environmental values.

A space where the seedlings production is perceived as a gateway to deeper reflections on the causes and possibilities of confronting the issue of soil degradation, loss of diversity, water, the widespread process of desertification in the region, giving birth to subjects able to promote actions to mitigate and adapt to climate change, revitalizing the hydrographic basins where they operate as rural producers and citizens.

The goal is contributing to the formation of citizenship with a daily eagerness for the construction of sustainable societies, learning, and educating through the practice.

The need for popular participation in processes of this nature is not always evident in the Project's daily activities, which traditionally prioritize physical execution.

The inversion of this logic is essential to the understanding of the success of current proposals in a world in which the thought that environmental degradation does nothing for the development still seems to predominate. The involvement in actions of this nature provides opportunities for reflection on the facts, reasons, and interests for which society is moving in this direction.

Questioning and evaluating the local/regional reality regarding such aspects is essential for the understanding of choices and that it is possible to follow paths based on solidarity, the universalization of quality of life, the appreciation of the environment, and of each human being as an active subject.

The "Nurseries" could be spaces for the production of plant species seedlings where, together with their production, processes of expansion of construction of knowledge, exercising procedures, and practices could be intentionally developed, shining a critical eye on relevant issues such as ethics, solidarity, socio-environmental responsibility, food safety, social inclusion, recovery of degraded areas, among others pertaining to the same dimension as the merely practical and economic aspects of the activity itself.

They would be spaces where the production of seedlings is treated as a gateway to thinking, feeling, and acting more emphatically on the causes and possibilities of coping with the socio-environmental problem.

Such a nursery would surpass the image of a simple seedling factory, methodically conducted, without establishing any kind of reflection on the complexity involved and broaden the thinking on the effects of climate change on the daily life of the communities.



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Seedlings for vivariums. Source: PROCASE.

Findings

What did the experiences teach?

All four practices met the general criteria of having acquired maturity after their implementation in time and space. They can also be considered within the scope of the broad subject of climate change, under the vertex of desertification, in the case of the three actions in Brazil, and the direct effects of climate change, in the case of the practice in Honduras.

As for the specific criteria, of the eight, five were relatively easy to identify and "validate" from the material available, which may indicate a certain fruitful homogeneity of the requirements and conditions for the Projects in encompassing common characteristics in all stages of planning and execution.

Three of them, however, required additional effort to be identified and recognized and, unfortunately, in most cases, were not: 1) Permeated by gender and youth issues, 2) Sociobiodiverse, and 3) Agrobiodiverse.

In addition to the dissociation of thematic approaches occurring endogenously to the Projects, in the case of the issue of gender and youth, there is no qualitative interactivity analyzed when it comes to knowing whether learning and participation have resulted in empowerment, better income, and equity among women and young people in real life communities benefited. Also: was it "good" for the environment? In other words, did it result in an expansion or improvement in performance? It seems very important to justify whatever hypothesis for more than necessary advances.

Thus, this study limited itself to accepting the information. However, a reserve remains on how to assimilate the results, with a suggestion that this criticism is made, and the measurements improved in future opportunities.

As a Sociobiodiverse and Agrobiodiverse experience, only the Recaatingamento practice clearly brought these aspects as strong presuppositions for effective planning and action. Therefore, inversely to the result on the five most common criteria, there was a clear need for reflection and improvement in those areas.

It could be a good idea to combine efforts on the various fronts of action so that the desired transformations come to fruition through the Projects and their selected practices.

SYSTEMATIZING IS REVEALING KNOWLEDGE

Practically [re]thinking the doing/knowing, translating it into learning (know-how), in old and modern formats of very didactic social communication for the introduction of the thought; PRO-LENCA has a lot to say through its excellence of communication materials and information updating.

In this aspect, there were case reports that brought a lot of positive expectations about voluntary adherence by people who did not directly participate and/or were benefitted from the actions. In any case, having an incentive to absorb such manifestations would be a way of uncovering unusual effects to be included in the experiences' heritage.

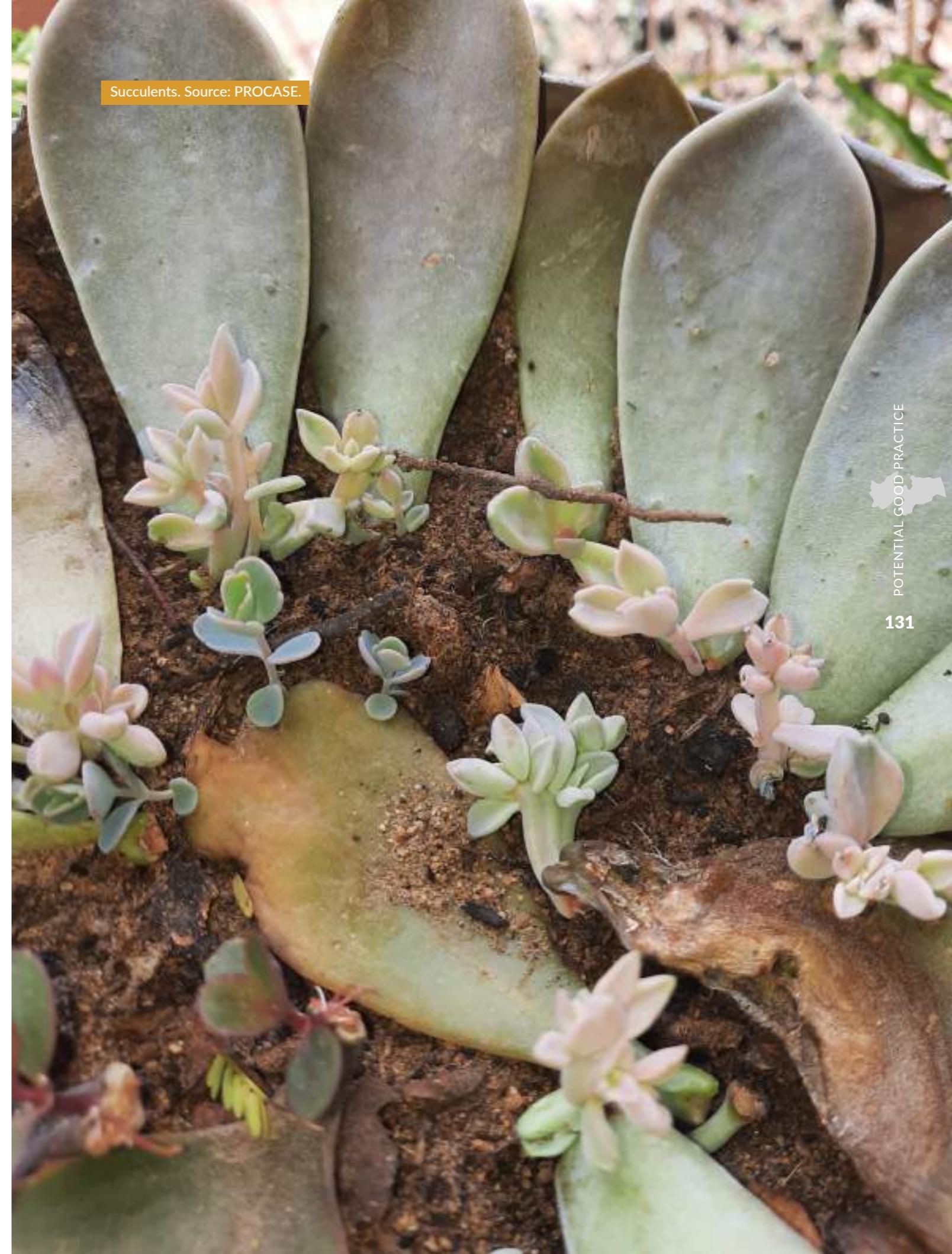
Perhaps, the partners could promote the appropriation by their participants through exchange and dialogue between existing experiences in Brazil and abroad, envisioning the transformation of those involved into protagonists of the action, as they would not only take ownership of the theme but also develop a sense of belonging to what has been developed.

The contribution in the process of formulating a new social imaginary that is capable of fostering discourses and practices aligned with the principles of the Sustainable Development Goals is the hope that all experiences achieve and fulfill their part.

In this sense, the conclusion also permeates the result of the process as a meeting of pieces of knowledge, the result of experiences that often go unnoticed. Such is Systematization, giving them the means to see and hear while revealing them as part of the newly acquired learning.

Thus is the dialectic of learning that means reflecting on what has been done and, hopefully, generating broader, collective, and solidary knowledge to be used by the experiences.

Succulents. Source: PROCASE.



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