Chapter 3

# Contributions of Embrapa to poverty eradication

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## Introduction

This chapter presents solutions related to the sustainable agrifood systems developed by Embrapa that contribute to the following targets of the Sustainable Development Goal 1 (SDG 1) (United Nations, 2018): Target 1.1) "By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day"; and target 1.2) "By 2030, reduce at least by half the proportion of men, women and children of all ages living in poverty in all its dimensions according to national definitions."

In addition to the contributions directly related to agrifood systems, Embrapa has accumulated several experiences and processes related to technological innovations, which enabled the inclusion of part of the population living in poverty and extreme poverty. Among these, it is important to mention that Embrapa recently participated in Brazil Without Misery Plan (Plano Brasil Sem Miséria, PBSM). It has worked in several territories of the Brazilian semi-arid region, being integrated with technical assistance and rural extended education networks, and public managers at the municipal, state, and federal levels. In a survey carried out to evaluate the families that were part of this program, access to the various public policies was indicated as one of the leading factors in improving the lives of the families. Among others, they mentioned the Light for All Program (Programa Luz para Todos); the programs that granted access and production of water – 1 Milhão de Cisternas (1 Million Cisterns) and Uma Terra Duas Águas (One Earth Two Waters); the policy of income transfer Bolsa Família; the Política de Assistência Técnica e Extensão Rural, Crédito e Fomento (Rural Policy of Technical Assistance and Rural Extension, Credit, and Rural Development); the Política de Aquisição de Alimentos, Educação (Food and Education Acquisition Policy); and the Sistema Único de Saúde (Unified Health

System – SUS). Embrapa has contributed to the execution and implementation of many of these policies, such as the National Policy on Agroecology and Organic Production, with the creation of Agroecology Centers in ten Embrapa Units, with the participation in the creation of Innovation Plans for Family Agriculture in all states within the National Policy of Technical Assistance and Rural Extension, as well as in the Policies for the Development of Traditional Peoples and Communities, and in the National Plan for the Promotion of Socio-Biodiversity Networks.

In the scope of agroecology, Embrapa has worked with projects aligned with agroecological innovation arrangements and portfolios, participating in the construction of knowledge and exchanges with family agriculture, indigenous peoples, and traditional communities. Embrapa has also been working to identify and strengthen the generation and availability of knowledge for ecologically-based production systems to achieve food, technological, energy, water, and agricultural and livestock sovereignty for family farming.

SDGs have been achieved through training actions with communities that live the reality of poverty. In this sense, actions of Embrapa focused on the continuous training of young farmers, graduate students, community leaders, and cooperators in concepts and practices in the field of disseminating technological information in rural communities, strengthening social life and community self-organization, as well as supporting productive rural inclusion.

Access to information on social principles and technologies suitable for family farming that allow the production of high quality and quantity food, without dependence on external inputs, stimulates short production to marketing circuits and strengthens the local economy starting from community organizations. Some of these actions of Embrapa will be covered in more detail in the next topics.

## Optimization of agrifood systems

Some of Embrapa's research, development, and innovation contributions for the sustainability of agrifood systems are:

- Subsidies for the formation of universal public policies and social inclusion.
- Agrifood systems technology and technology that uses low-input resources that value local and traditional knowledge.
- Technologies for the production of locally produced healthy foods and appreciation of plant products from agrobiodiversity.

- Technologies to reduce the costs of food production.
- Expansion of access to knowledge and information that contribute to the improvement of the quality of life, food, and nutritional security, as well as to the development of citizenship.
- Research, training, and autonomous and participatory organizational systems.
- Research and support for social and solidarity economies.
- Collective construction of knowledge, and socialization and systematization of traditional and scientific knowledge for sustainable agrifood systems.
- Subsidies for public policies on food and nutritional security and sustainable agrifood systems.
- Technologies and training for urban agriculture and family self-consumption (see SDG 11).
- Certification of products from traditional production systems (Figure 1).
- Marking of origin and geographical origin identification for products from traditional production systems in the Brazilian semiarid region.

## Optimization of water resources

Brazil has a coastal dimension of more than 8,000 km and a continental potential that includes 13% of the world's freshwater, including the largest hydrographic basins (Joly et al., 2011; Conjuntura..., 2012). About more than 1 million people live directly, and 4 million people indirectly from the extraction of fishing resources in Brazil, whether marine or continental (Brasil, 2012). Artisanal fishing still plays a key role in maintaining the local economy, food security, and culture of thousands of traditional communities, and is a vector for socioeconomic standards and poverty reduction. However, predatory exploitation threatens most fishing resources of economic interest and environments in which they are located.

Embrapa conducts research and development actions that optimize sustainable use of water resources and contributes to increasing the resilience of historically marginalized riverine and fishers populations. These actions seek to reduce their vulnerability to environmental and mainly socioeconomic and political externalities in several regions of Brazil, for example:

Photo: Paulo Lanzetta

**Figure 1.** Family farming products, including seeds and traditional cultivars.

- Participatory creation/adaptation of technologies to improve the efficiency on gillnets of artisanal fisheries in the Araguaia-Tocantins Basin, focusing on target species and minimizing losses in the productive chain.
- Monitoring of landings and the incentive to management and participatory management of artisanal fishing, aiming at recovery, conservation, and sustainable use of fishing resources and the productive chain in the Brazilian Amazon region communities (Pará, Tocantins, and Roraima).
- Fishing monitoring in the Upper Paraguay Basin and appreciation of the ethno-knowledge of fishing communities in order to develop a fish conservation strategy in the Pantanal Basin, thus contributing to public policies and decision-making related to the sustainable management of fishery resources. It is worth noting the importance of the *Pantanal*, a biome rich in fish resources, used both by amateur and professional fishing, and a source of subsistence for riverine families. The monitoring system addresses research data in order to Embrapa Pantanal understand the biological and socioeconomic trends of fishery, generating subsidies for fisheries management, under the responsibility of the environmental agencies.
- Development of protocols to estimate the shelf life of fish preserved in ice, serving as a tool to evaluate fish freshness.

## Support of Embrapa for Brazil Without Misery Plan

The search for protagonism of rural workers, the promotion of a critical reading of the world, as well as the access to technological and scientific information are considered part of the elements capable of contributing to the creation of citizens committed to social and environmental sustainability. For this, Embrapa develops projects and actions that adapt to different social contexts and synergize with the country's targets of combating poverty, especially rural poverty, as will be addressed in this book.

In 2011, the federal government instituted, through Decree 7,492/2011, Brazil Without Misery Plan (PBSM) (Brasil, 2011) to overcome extreme poverty. The initiative was organized in three axes: the first one to guarantee income, for immediate relief of extreme poverty; the second to access public services, to improve the conditions of education, health, and citizenship of families; and the

third to promote inclusion, to increase the capacities and opportunities of work and income generation among the poorest rural and urban families (Brasil, 2015).

Embrapa participated in the first phase of the plan with seeds and print material (leaflets and booklets) distribution for family farmers in the Brazilian semiarid region. In 2014, it started to integrate the BSM institutional arrangement in the rural production inclusion axis through 12 territorial projects and five cross-cut projects, whose challenges were: find technological solutions; create spaces for socio-technical experimentation by the population living in extreme poverty in the Brazilian semiarid region; innovate its methodologies and strategies, as well as its organizational structure for a better sharing of knowledge; and disseminate technologies (Beltrão et al., 2017).

## Training and information dissemination

Embrapa performs different training actions and for different audiences (see SDG 4: Quality Education). One of the cross-cutting training projects highlighted was Ações de Capacitação e de Divulgação de Informações Tecnológicas para Apoio à Inclusão Produtiva Rural, no Plano Brasil Sem Miséria (Actions for Training and Dissemination of Technological Information to Support Rural Production Inclusion in Brazil Without Misery Plan – Acar), led by Embrapa. Among the main actions of Acar project is the community communication training for local development with development agents (community leaders, rural youth, radio broadcasters, and extensionists) in the 14 territórios da cidadania (territories of citizenship) to strengthen and integrate communities with rural production inclusion projects, coordinated by Embrapa.

Embrapa has made it possible for family farmers, *quilombola* communities, and rural young people to access technological solutions and innovations that are inexpensive, easy to apply and can be adapted locally. Many of these technologies were addressed in the community communication training workshops. "Comunicação comunitária para o fortalecimento do desenvolvimento local" (community communication for the strengthening of local development) methodology was certified as a social technology by the Banco do Brasil Foundation (FBB) as it applies to different socio-cultural realities and contexts.

Another important action of Embrapa developed directly with the schools are the Mini Libraries, an institutional initiative to encourage reading and productive inclusion in rural areas (Figure 2). In order to do this, the Mini Libraries are organized

regionally, according to the interest of the intended audience, and gather, in a traveling collection, printed publications (books, booklets, manuals, etc.), videos, and audios of radio and TV programs, providing technological information generated by Embrapa and its partners on agricultural crops, small animal husbandry, environment, family agroindustry, among many other topics. There was also an expansion of the Mini Libraries in schools and communities in these territories, in more than 1,200 municipalities in the country. The Mini Library was certified as a social technology by the FBB because it helps a public policy, is complementary with other local actions that stimulate social participation, and contributes to the development of key alliances to eradicate poverty.


Photo: Mauricilia Pereira da Silva

**Figure 2.** Mini Library in a rural school in the municipality of Xapuri, state of Acre, Brazil.

The expansion of access to knowledge and information that contribute to the improvement of the quality of life, food, and nutritional security, as well as to the formation of citizenship, occurred through actions such as:

- The weekly radio program Prosa Rural (Figure 3), which presents, in all regions, topics that reinforce technologies and good practices for the production of safe food. Each week, for 15 minutes, thousands of Brazilian homes receive the sounds of Prosa Rural and learn about the low-cost and

easy-to-use technologies and products developed by Embrapa for young and family farmers of the Brazilian semi-arid, Vale do Jequitinhonha, and the North, Midwest, Southeast, and South regions. Prosa Rural was conceived in 2003, based on Embrapa's interest in creating an environment to disseminate technologies and other information that could be useful for the day-to-day life of numerous rural families in the Northeastern semi-arid as one of several lines of action of the federal government Fome Zero (Zero Hunger) program.

Photo: Kátia Simone Marsicano Corrêa

**Figure 3.** Announcers of the Prosa Rural program recording at the Embrapa studio, Brasília, DF, Brazil.

- Development of a communication methodology for the protagonism of young people, farmers, and community leaders in the local communication process. A methodology that is re-applicable through training, it combines communication and education strategies, both face-to-face and long-distance, with the use of social media and digital platform resources (Agropedia brasilis), aimed at promoting better interaction between research, extension, and agriculture. It is applied to the technology transfer projects developed by Embrapa and its main goal is continuous training of farmers, graduate students, and community leaders, all cooperating in concepts and practices in the field of agriculture/agroecology and

communication. After the training process, the participants are supposed to have a broader understanding of the technological projects in which they are inserted and, at the same time, to the use of communication resources (audios, videos, texts, Facebook, WhatsApp), to systematize their experiences, collaborate in the production of pedagogical materials in the field of agriculture, and integrate technological networks.

- Distribution of free and open access repositories of thousands of publications by Embrapa. These repositories include Infoteca-e, Alice repositor, and Agricultural Research Database (Base de Dados da Pesquisa Agropecuária, BDPA).

Infoteca-e is an open access repository of technological information that provides rural producers, extended education workers, agricultural technicians, students and teachers of rural schools, cooperatives, and other segments of agricultural production, with information on Embrapa and its partners' technologies. These publications have been edited – in easily readable language – into booklets, books, manuals, and radio and television programs.

The Alice repository is composed of scientific information produced by Embrapa researchers and edited into book chapters, articles in indexed journals, articles in congress proceedings, theses and dissertations, white papers, among other types of publications, contributing to increasing the impact of search results.

BDPA is a database that gathers the documents that compose the collection of Embrapa libraries, including the literature generated and the literature acquired: books, pamphlets, theses, papers presented at technical-scientific events, digital documents, maps, etc.

## Final considerations

The mission of Embrapa is to enable research, development, and innovative solutions for agricultural sustainability to benefit Brazilian society. The concern with food security is also clearly defined in its Institutional Vision, namely: "being a global reference in the generation and supply of information, knowledge, and technologies, contributing to the innovation and sustainability of agriculture and food security." It is clear, therefore, that the great action focus of Embrapa is related to the generation of value in agriculture, focusing on food security, in favor of Brazilian and the world's society. As a result, its research system contains 25 Portfolios and 93 Arrangements composed of several research projects that

directly or transversally deal with topics such as food production, food security, and human capacity improvement. Some of the results obtained from these projects were presented throughout this chapter, notably those with contribution directly linked to the fulfillment of targets 1.1 and 1.2 of SDG 1. There is much more being done by Embrapa to eradicate poverty when considering its multidimensional character, and many of the contributions presented in other e-books in the series are also related to achieving these targets.

Finally, it should be pointed out that, thinking about observing the 2030 Agenda for Sustainable Development (Nações Unidas, 2018), Embrapa has identified macro trends for agriculture, among which the focus is on establishing research that contributes to quality and aggregation of value in strategies of productive arrangements of small- and medium-scale producers, including strategies to evolve family farms to turn into highly profitable enterprises, which undoubtedly presents itself as a substantial contribution to eradicating poverty in the Brazilian rural environment. Thus, it is expected that the innovative information, products, and processes developed by Embrapa will make it possible to include part of the Brazilian population that lives in poverty and extreme poverty conditions in different regions of the country.

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