

# AGRICULTURAL RESEARCH AND INNOVATION IN THE 2030 AGENDA

## CONTRIBUTIONS OF EMBRAPA AND PARTNERS

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Technical Editors





**Brazilian Agricultural Research Corporation**  
**Ministry of Agriculture, Livestock and Food Supply**



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## Chapter 2

# Contributions of Embrapa to the 5 Ps: People, Prosperity, Planet, Partnership and Peace

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## Introduction

In the other 17 books of the Sustainable Development Goals Collection (SDG Collection), several contributions of Embrapa are presented to support the achievement of SDG targets, with solutions that represent important advances in the quality of life of rural and urban populations, both nationally and internationally.

The first step was accomplished in a 20-hour workshop, which was attended by 24 researchers and analysts, all of whom involved in organizing the SDG Collection. Together, they organized files with the contributions quoted in the books, to which several authors of the respective books collaborated. The result was a sample of 670 contributions mentioned in the SDG Collection.

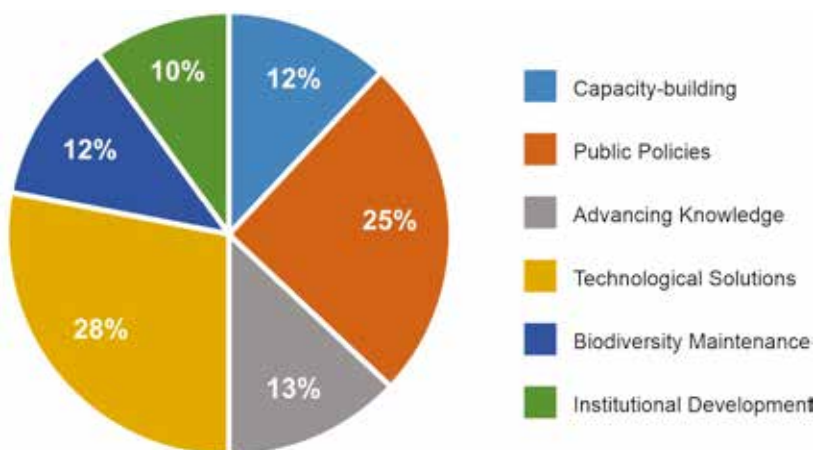
The contributions represented the six result categories below:

- **Capacity-building and training** – Support for training undergraduate and graduate students; capacity-building and technological refresher training to peer educators.
- **Support for designing or implementing public policies** – Identification and prioritization of opportunities and demands related to public policies.
- **Advancing knowledge** – Production of research solutions that can be applied in agricultural production; impact assessment or socioeconomic studies; prospective studies.
- **Technological solutions** – Development of cultivars; strains/races/types; agro-industrial or agricultural inputs; innovation assets; technical-scientific methodologies in R&D, TT or communication; technology business; new technical processes; agro-industrial practices/processes; agricultural practices/processes; improved processes, methodologies or technical studies; agro-industrial products; pre-technological products; prototypes of machinery, equipment and implements; information or analysis systems; software for external customers.
- **Biodiversity maintenance** – Building up and/or conservation of biological collections and germplasm banks; inventories and characterization of genetic and biocultural diversity.
- **Institutional development** – Internal capacity-building in strategic areas; corporate image; incremental improvements or technical-administrative processes; corporate or specific software; new organizational and/or managerial processes; improved processes, methodologies or organizational and/or managerial studies.

Most contributions were categorized as a technological solution or support for public policies (Figure 1).

In order to build a systemic view of all these contributions, the sample of contributions was reorganized according to the five areas considered of critical importance for humanity and the planet, named by the United Nations (UN) as [5 Ps, that is, People, Prosperity, Planet, Partnership and Peace](#). The 17 SDGs were classified according to these dimensions, based on a proposition by Wollaert (2016): in the People dimension, SDGs 1, 2, 3, 4 and 5 are grouped together; in the Prosperity dimension, SDGs 7, 8, 9 and 10; in the Planet dimension, SDGs 6,

12, 13, 14 and 15; in the Partnership dimension, SDGs 11 and 17; and in the Peace dimension, SDGs 16 (Figure 2).



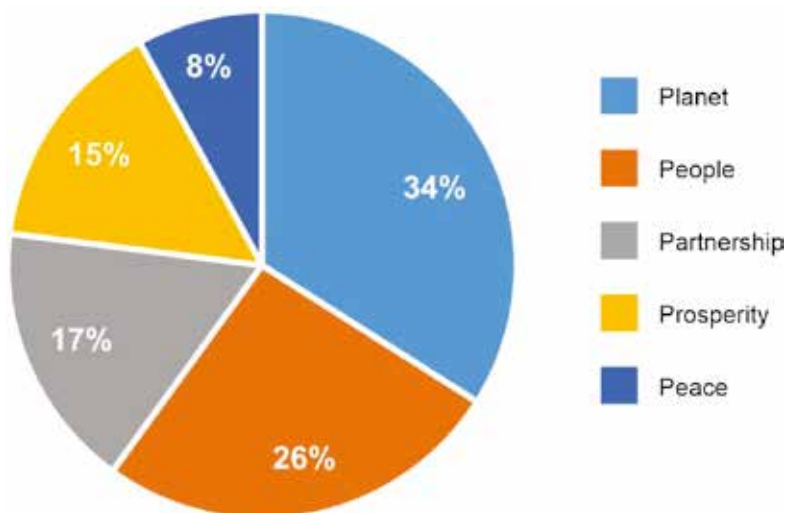
**Figure 1.** Percentage distribution (by category) of the contributions of Embrapa to SDGs, as collected in the workshop.



**Figure 2.** Schematic representation of the 5 Ps of the [2030 Agenda](#) and the 17 UN Sustainable Development Goals.

Source: Wollaert (2016).

In the initial steps of aligning to SDGs, the Working Group set up by Embrapa to assign an institutional locus for the theme (SDG Embrapa WG) listed 76 SDG targets that could be supported by Embrapa. Based on the classification proposed by Wollaert (2016), 60% of these 76 targets relate to the Planet (34%) and People (26%) dimensions of 10 of the SDGs. The remaining 40%, to which Embrapa provides contributions, relate to Partnership, Prosperity and Peace dimensions of 7 SDGs (Figure 3).



**Figure 3.** Percentage distribution of the contributions of Embrapa to the 5 Ps dimensions of the UN 2030 Agenda, considering the 76 SDG targets selected by Embrapa.

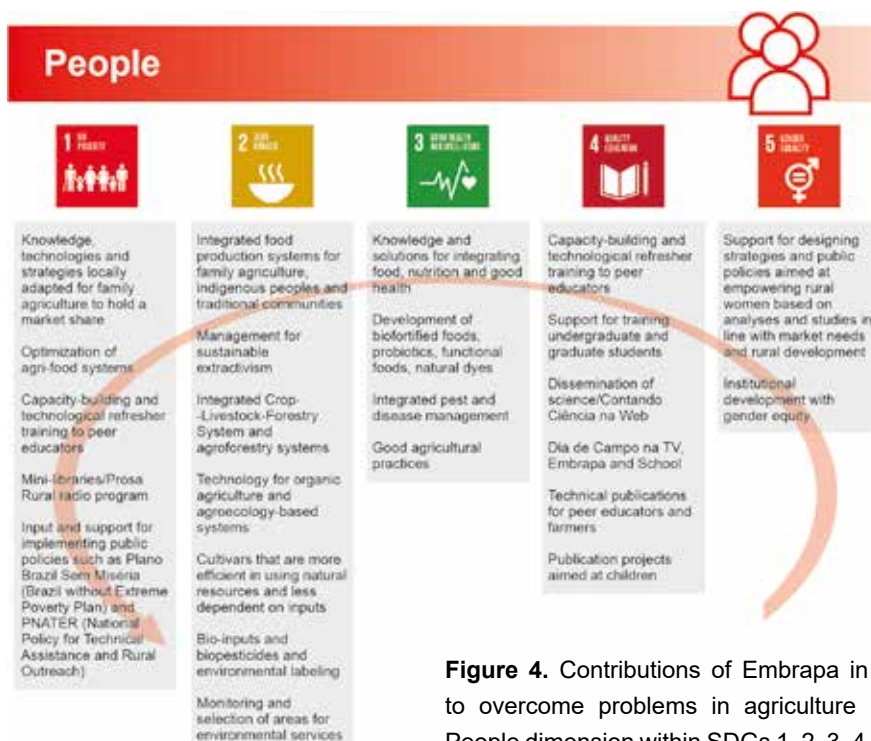
The following topics show the results and analyses resulting from these categorizations per dimension.

## Contributions to the People dimension

In the People dimension, the commitment of the UN member states is to end poverty and hunger in all its forms and dimensions and to ensure that all human beings can realize their full potential with dignity and equality in a healthy environment.

In the context of Embrapa, in tune with the listed targets, the People dimension is addressed in SDGs 1, 2, 3, 4 and 5 (Figure 4), which together comprise 20 targets (26% of the total) to which the actions of Embrapa contribute directly or indirectly.





**Figure 4.** Contributions of Embrapa in RD&I to overcome problems in agriculture in the People dimension within SDGs 1, 2, 3, 4 and 5.

These actions involve supporting the generation of employment and income, especially for family farmers, by optimizing their agri-food systems, taking into account the multifunctionality of rural areas, with the production of nutritious, safe, diversified and accessible food for all, as a way of coping with problems related to poverty and hunger (SDGs 1 and 2).

In order to maintain a healthy environment and well-being for all, Embrapa produces, for example, knowledge and technologies for sustainable agriculture, such as inputs and products that reduce environmental impacts (SDG 2) and biofortified, functional and probiotic foods, among others, with a focus on integrating food, nutrition and health (SDG 3). Finally, in order for people to realize their full potential with dignity and equality (SDG 4 and 5), Embrapa offers quality training and information that are easily accessible to women and men in the countryside and in the city.

In order to promote a healthy environment and well-being for all, Embrapa produces, for instance, knowledge and technologies for sustainable agriculture, such as inputs and products with reduced impact (SDG 2) and biofortified,

functional and probiotic foods, among others, focused on integrating food, nutrition and health care (SDG 3). Finally, so that people can fully realize their potential with dignity and equality (SDGs 4 and 5), Embrapa provides opportunities for quality training and information that are easily accessible by men and women from the countryside and the city.

A healthy environment is that where an activity is carried out without endangering human good health and environmental health. Sustainable agriculture (SDG 2), in addition to enabling the economic sustainability of people (reducing social inequalities and expanding rights and access to public services, especially education and healthcare), should aim at the rational use and conservation of natural resources. There are many Embrapa efforts in pursuit of low-impact production systems and technologies, as well as good agricultural practices, that keep soil, water, air and, consequently, human health, intact. In all the SDG Book Collection volumes, one can clearly see Embrapa's efforts towards human development in a country where differences between regions and ecosystems entail specific local needs.

Contributions to biodiversity conservation, management and use (SDGs 2 and 15) encompass several actions:

- Maintenance of germplasm banks, herbariums, museums and databases on plants, animals and microorganisms.
- Forest management, forest certification and sustainable extraction of (timber and non-timber) forest products.
- Studies and technologies for freshwater species.
- Community management of agrobiodiversity genetic resources.
- Studies on endangered animal species and pollinating insects.
- Strategies for conserving food plant diversity in *ex situ* and on-farm gene banks.

Also in terms of healthcare and well-being (SDG 3), Embrapa stands out by creating raw materials and agro-industrial processes to obtain products that meet the nutritional, functional and sensorial demands of consumers. The nexus between food, nutrition and good health is one of the most important in the People dimension; however, in the Agenda, the synergy between these elements and SDGs 2 and 3 is not very explicit.

To ensure that everyone can fully realize their potential with dignity and equality, Embrapa collaborates with quality education (SDG 4) by substantially supporting the training of undergraduate and graduate students and promoting the capacity-building and technological refresher training to peer educators, as well as offering a wide range of publications to different audiences, thus expanding society's access to proper technical and scientific information and popularizing science. In addition, at the invitation of popular radio and TV theme program producers, Embrapa provides agricultural research information, which is available at virtual networks, videos, interactive digital books and institutional channels on the Internet ([Embrapa Portal](#), [facebook.com/embrapa](#), [twitter.com/embrapa](#), [youtube.com/embrapa](#), [flickr.com/Embrapa](#), [Dia de Campo na TV](#)). Aimed at the children and youth audience, the [Programa Embrapa & Escola](#) was created to educate children and youth; and [Mini-libraries](#) material is distributed to public schools free of charge. These are examples of contributions to educate thousands of people not only in Brazil but also in other parts of the world.

At the international level, Embrapa contributes to training people living in more than 30 countries in Africa, especially in Mozambique, Angola, Cape Verde, São Tomé and Príncipe and Guinea Bissau. Training also extended to some countries in Latin America: Colombia, Ecuador, Peru, Venezuela and Mexico.

Finally, to ensure that everyone can fully realize their potential with dignity and equality, the promotion of economic autonomy must also reach women, who must be benefited by having access to quality information and support for their specific demands. Embrapa has been providing input and supporting the implementation of national public policies for this audience mainly involving rural women and collectors. Providing access to knowledge by implementing production system demonstration and observation units, small animal breeding, medicinal plants, processing and adding value to different products, are actions that seek to expand the productive activities of women and promote their entrepreneurship. Embrapa's adherence to the [Programa Pró-Equidade de Gênero e Raça da Secretaria Nacional de Políticas para as Mulheres da Presidência da República](#) (Gender and Race Pro-Equity Program of the Brazilian Secretariat of Policies for Women of the Presidency of the Republic – SPM/PR) and to the [Women's Empowerment Principles – Equality Means Business](#) (ONU Mulheres, 2016) were also highlighted as part of enhancing the role of women in institutional development.

Embrapa researchers have been working with rural communities, whose members are unable to meet their basic needs, especially in terms of access to quality food

in a satisfactory quantity, have limited capacity for social organization and lack of technical training. Therefore, the implementation of mechanisms and instruments for planning, organizing, managing, training and implementing agri-food systems represent effective Embrapa strategies to bring about changes in the local quality of life.

## Contributions to the Prosperity dimension

The Prosperity dimension established in UN's 2030 Agenda aims to ensure that all human beings can enjoy a prosperous life and full personal fulfillment, and that economic, social and technological progress take place in harmony with nature. In the context of Embrapa, the Prosperity dimension is addressed in SDGs 7, 8, 9 and 10 (Figure 5), which together comprise 11 targets (15% of the total) to which actions of Embrapa contribute directly.



**Figure 5.** Contributions of Embrapa in RD&I to overcome problems in agriculture in the Prosperity dimension within SDGs 7, 8, 9 and 10.

The Prosperity dimension directly resonates with at least five strategic goals of the [Master Plan of Embrapa](#):

- Expanding the knowledge base and increasing assets to accelerate the development and incorporation of advanced solutions to agri-food and agro-industrial systems, based on sciences and emerging technologies.
- Developing, adapting and disseminating knowledge and technologies in automation, precision agriculture and information and communication technologies to increase the sustainability of production systems and to add value to agricultural products and processes.
- Increasing agricultural innovation assets based on the use of biocomponents, substances and technological routes that contribute to the development of new bio-industries, focusing on renewable energy, green chemistry and new materials.
- Supporting the improvement and design of strategies and public policies based on analysis and studies focused on market needs and rural development.
- Producing knowledge and technologies that promote managerial innovations to address, with efficiency, efficacy and effectivity, the increasing complexity and multifunctionality of agriculture.

Embrapa contributes with SDG 7 (which addresses Clean and Accessible Energy) by producing knowledge and technological solutions on energy sources alternative to fossil fuels based on biomass, wind and solar energy, biogas production and micro-generation of electric power, among others.

Contributions to SDG 8, on Decent Work and Economic Growth, involve, among others, inputs for delimitation of geoeconomic regions and for Geographical Indication (GI), which are excellence production areas where unique products are developed, thus enhancing their recognition and favoring the economic growth of the involved communities. Also addressing this SDG are Embrapa technological solutions for developing cultivars and breeds that increase productivity and/or product quality, and prototypes of machinery, equipment and implements that increase efficiency and reduce the hard work in the field.

In relation to SDG 9, regarding Industry and Innovation and Infrastructure, Embrapa has been increasing agricultural innovation assets based on the use of biocomponents, substances and technological routes that contribute to developing new bioindustries focused on renewable energy, green chemistry and

new materials within bioeconomy. Examples of pre-technological products in the biotechnology area for industry use are: mini-processing facilities, mini-plants for waste use, new agro-industrial practices and/or processes for beverages, preserves, meat, dairy products and extractive crops, among others.

In relation to SDG 10, on Reduced Inequalities, contributions of Embrapa involved the capacity-building and technological refresher training to peer educators; the domestication and management of extractive resources with a broad consumer market, so that the living standards of riverine people could improve; the support for the interaction among local socio-technical networks; and the strengthening of agro-industrial enterprises that aim to add value to products from collectors and family farmers. Other contributions to SDG 10 are the availability of qualified and accessible information that favors farmers (both men and women) in entering markets and the fostering of entrepreneurship. Examples of this type of contribution are Embrapa's Open Access Repository to Scientific Information ([Alice](#), in Portuguese) and Embrapa's Open and Integrated Information System in Agriculture ([Sabia](#), in Portuguese).

Because of the interdependence between dimensions, the People dimension greatly influences the Prosperity dimension. Thus, SDG 1 (No Poverty) stresses the development of agri-food systems and other activities that contribute to reducing social differences, along with enhancing value generation for the agricultural sector, especially in extreme poverty regions.

In relation to SDG 4, which addresses Quality Education, actions are related to formal and non-formal education based on the perception that it is necessary to foster entrepreneurship and disseminate knowledge and technologies to all, and encourage inclusive and awareness-building education that affords learning opportunities and promotes change. Qualified and accessible information helps farmers (women and men) to enter markets and develop entrepreneurship.

Entrepreneurship leads to autonomy, income generation and access to products and services, which improve the quality of life and makes it possible to include the poor and extremely poor Brazilian population, thus reducing inequalities. In order to provide effective technological solutions, the training of present and future peer educators both supports technology users and provide an opportunity to identify needs for improvements or new technological challenges, which must be faced with new technologies. It thus closes a virtuous circle of generation of technology-capacity-building-use-generation of new demands, reconciling scientific and popular knowledge for prosperity.

In turn, in relation to SDG 11 (Sustainable Cities and Communities), the influence of the Planet dimension is clear, as perceived by Embrapa through the intense relationship and, therefore, the strong interdependence between urban and rural areas. The flows of goods, people, money and information between these environments reveal this close and prosperous relationship. Natural resources, which are mostly concentrated in the rural areas, are vital to supply the population and enable industry, commerce and services to function properly. The richest cities are those that demand more energy and those that throw more solid waste and effluent into the environment. In this context, Embrapa has sought to understand these environments as parts of a single structure, considering that an isolated approach is only a partial approximation of reality. This strategic and broad vision is fundamental to a prosperous country.

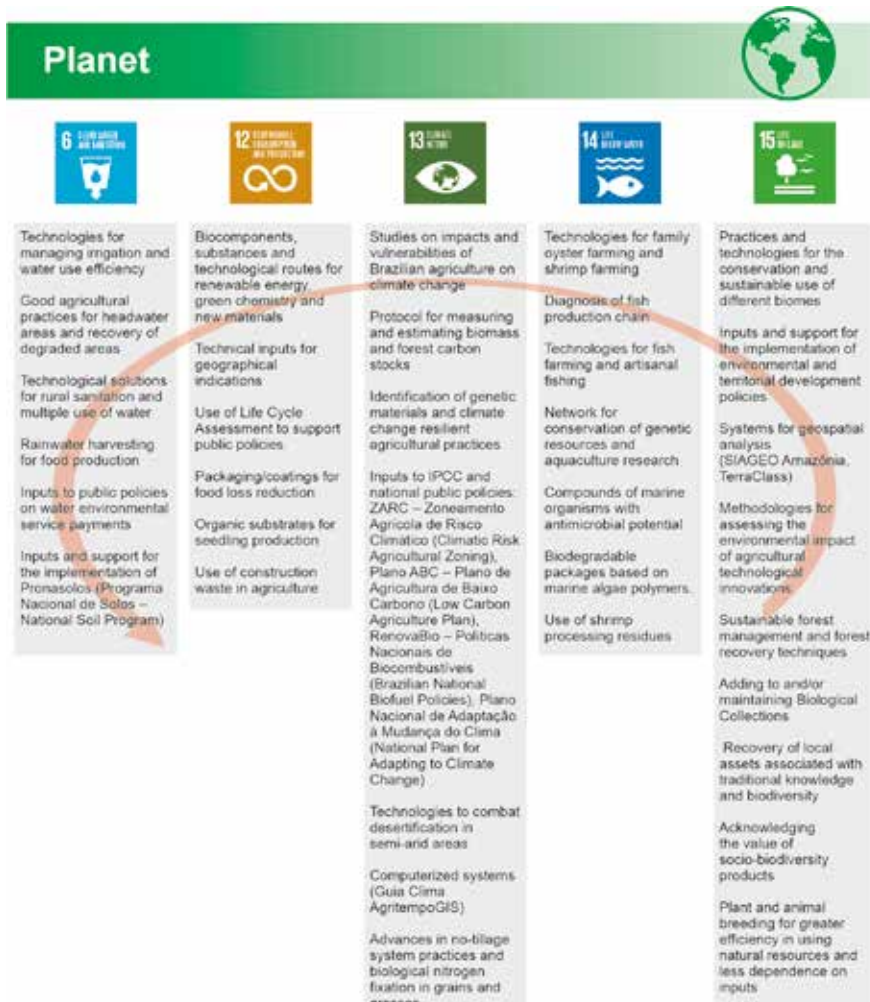
## Contributions to the Planet dimension

UN's concept of the Planet dimension concerns the protection of the planet from degradation, especially through sustainable consumption and production, sustainable management of its natural resources and urgent measures on climate change, so that it can meet the needs of present and future generations.

In the context of Embrapa, the Planet dimension is addressed based on SDGs 6, 12, 13, 14 and 15 (Figure 6), which together comprise 26 targets (34% of the total), for which actions of Embrapa contribute directly.

Six of the 12 strategic objectives of Embrapa, included in its 2014-2034 Master Plan (Embrapa, 2015) are related to the targets of SDG 15. The main contributions address the following areas: knowledge for the sustainable use of Brazilian biomes, management of forests, water and soil resources, diagnosis and assessment of ecosystem services, conservation and management of biodiversity and agrobiodiversity, assessment of environmental impacts and actions for the mitigation of greenhouse gases (GHGs) and adaptation to the negative effects of global warming, including the restoration of degraded vegetation.

Research and innovation contributions to water resources management (SDG 6) address, among other themes: water conservation and harvesting, water quality monitoring, water production, wastewater use, treatment of effluent sediments of agricultural and livestock operations, water use efficiency in irrigation, land classification for irrigation, water demand for agriculture, multiple water use, monitoring of rural basins, decision support systems for irrigation, and



**Figure 6.** Contributions of Embrapa in RD&I to overcome problems in agriculture in the Planet dimension within SDGs 6, 12, 13, 14 and 15.

methodologies for environmental risk assessment in water and soil resources. Based on the results and their experience, Embrapa researchers provided input for environmental and territorial development policies.

Contributions related to sustainable production and consumption (SDG 12) cover the following areas: research and development of organic and ecologically-based production systems, integrated production systems and good agricultural practices; the latter concerns, among other factors, agriculture without burning, biological nitrogen fixation, biological control, loss reduction



at harvest and post-harvest. The survey and interpretation of Brazilian soils and the contributions for conservation and management practices and for degraded areas recovery are efforts to contribute to environmental quality in urban and rural areas. The Life Cycle Assessment (LCA) stands out, which is a management tool that allows evaluating the environmental performance of products throughout their entire life cycle. In the national agricultural sector, LCA can contribute to promote a cleaner agriculture and to increase the international market share of Brazilian agricultural products. Among the objectives of the [Embrapa national LCA network research](#) is to provide information to support analyses of production systems of some of the most important Brazilian agribusiness products: sugarcane, soybean, maize, mango, eucalyptus and beef cattle.

In addition, Embrapa contributes with technical studies conducted by teams engaged in its Climate Change Projects portfolio, which, in turn, provide input to the Intergovernmental Panel on Climate Change (IPCC), the Laboratório de Avaliação de Emissão (Emission Assessment Laboratory) and the Inventário Nacional de Gases de Efeito Estufa (National Inventory of Greenhouse Gases) (SDG 13). This knowledge also helps to support agriculture negotiations on international climate change agendas, such as the UN Framework Convention on Climate Change (UNFCCC) and also contribute to set targets for adaptation and reduction of greenhouse gas emissions, such as those negotiated under the Kyoto Protocol, Nationally Appropriate Mitigation Actions (NAMAs), the Paris Agreement and Brazil's Nationally Determined Contribution (NDC).

In addition, Embrapa contributes to mitigating GHGs emissions and adapting to climate change aiming at the sustainability of human life on the planet. These initiatives include research, studies and assessments on the following topics:

- Extreme events and their impacts.
- Availability of information systems on agrometeorological data.
- Climate risks monitoring and zoning.
- Conservation practices for agriculture.
- Identification and/or development of drought-and-high-temperature-tolerant genetic materials.
- Renewable sources of energy to improve the Brazilian energy mix.
- Decarbonization of agriculture and actions to combat desertification.

There are also research actions aimed at identifying, in different ecosystems, the synergic potential of tree species and food producing species, thus seeking to design agroforestry systems that both provide environmental services and lead to increased farmer income. The new models and associations provided by the [Rede de Integração Lavoura, Pecuária e Floresta](#) (Integrated Crop-Livestock-Forestry System Network) have allowed sustainable production on a smaller scale, thus contributing as income options in small properties.

Concerning life in the oceans (SDG 14), contributions are focused on the following topics:

- Technologies for oyster farming, shrimp family farming, fish farming and artisanal fisheries.
- Analysis of fish production chains.
- Compounds of marine organisms with antimicrobial potential.
- Biodegradable packages based on algae-based polymers.
- Use of shrimp processing residues.

SDG 15 is essentially related to the work carried out by Embrapa. For example, nearly all Decentralized Units of Embrapa are involved in maintaining the genetic variability of Brazilian biomes. Active germplasm collections are the basis for the genetic and phenotypic characterization of accessions, which involve identifying unique characteristics of each sample. Technological solutions developed by Embrapa to improve production systems of relevant species for the Brazilian population's diet seek to create and assess genetic material suitable to each environment, which includes creating biological inputs, agricultural practices that favor the maintenance of soil biological activity, integrated production systems linking crops to animal breeding, water resource conservation and low carbon technologies. Embrapa is also focused on designing protocols and models to recover degraded environments and developing and offering technologies to enhance planted forests productivity. Embrapa has been giving priority to forest management, a topic which involves long-term research, since the creation of its research groups, that is, from 1978 onwards. Contributions related to advancing research on ecosystem services involve mapping them, developing technologies, knowledge and practices as inputs for policies and maintenance actions, expanding and recovering environmental services, strengthening sustainable production systems and rationally using different Brazilian biomes, as well as improving environmental impact assessment methods.

In addition, Embrapa, in collaboration with ministries, has been monitoring and managing institutional positions on natural resource management and climate change in conventions, agreements, protocols, treaties, commissions and world forums. In addition, it has participated in decisions related to national and global policies by offering technical and scientific support. In these international events, Embrapa has been offering support for the Brazilian delegations. In addition, it has been supporting congressmen and special commissions in discussing new laws on those topics in the Brazilian Congress.

## Contributions to the Partnership dimension

The Partnership dimension addresses the need to mobilize the necessary resources to implement UN's 2030 Agenda through a global partnership for sustainable development based on an enhanced spirit of global solidarity, focusing particularly on the needs of the poorest and most vulnerable, with the participation of the whole of society.

In the context of Embrapa, the Partnership dimension is addressed in SDGs 11 and 17 (Figure 7), which together encompass 13 targets (17% of the total), for which actions of Embrapa contribute directly. SDG 11 reveals the concern to make cities and human settlements inclusive, safe, resilient and sustainable places. SDG 17 addresses the strengthening of means of implementation by revitalizing global partnership for sustainable development.

The Partnership dimension is directly related to at least two strategic goals of the Master Plan of Embrapa: "Expanding networking and relations with national partnerships" and "Consolidating Embrapa's international presence".

National and international partnerships and working in cooperation have been part of the routine of Embrapa throughout its existence. Its technical staff was trained in leading universities in Brazil and abroad, where employees had the opportunity to complete their academic training. Most of these networks still remain and have strengthened over time through joint projects and exchange of people. Technical cooperation, by integrating efforts of Embrapa and national and international universities, aiming at conducting agricultural research of mutual interest, also strengthens undergraduate and postgraduate programs.

Various cooperative working models have been established, thus taking the best of time and resources and reducing costs. Regardless of geographic coverage, cooperation and partnership strategies that join Embrapa to the production



**Figure 7.** Contributions of Embrapa in RD&I to overcome problems in agriculture in the Partnership dimension within SDGs 11 and 17.

sector and to peer educators and technology transfer agents bring significant gains to society.

Many solutions developed by Embrapa and partnerships, commonly used today in Brazilian agriculture, are the result of institutional arrangements with other institutions in the tropical world. Strong examples of the value of partnerships can relate to:

- Adaptation to Brazilian conditions of African grasses, which today support our powerful livestock.
- Intense sharing of knowledge between Embrapa and foreign institutions, which allowed conducting research studies related to biological nitrogen fixation.
- Joint work with representative associations of vulnerable Brazilian rural segments in order to develop sustainable solutions to support small farmers market entrance.

Some themes often relate to partnerships of Embrapa, such as: family agriculture, biome sustainability, international agreements, use and conservation of natural resources, biodiversity conservation, agroecology, genetic resources, climate zoning, benefit sharing, and food security.

Collaboration with companies, cooperatives, associations, universities and research institutes in Brazil and abroad provides feedback to the Research & Development process, thus allowing future goals to be set and corrections to be made with enough precision to continuously meet society's demands.

Embrapa has gained expertise and developed technologies that have been shared with other countries (SDG 17), especially to support efforts to end poverty in all its forms and dimensions, including extreme poverty, considered by the UN members as the greatest global challenge and an indispensable requirement for sustainable development. Shared results respond to global demands for science-based development and have been key elements for joint technological development. This cooperation opens new routes for development, including commercial ones. Experience teaches that partnerships are effective means to positively affect the socioeconomic reality of peoples.

Embrapa also supports most agreements signed by Brazil at major United Nations conferences and summits by offering its research results and technical and scientific knowledge, which have helped to set solid foundations for sustainable development and to shape the new Agenda. These events include: the Rio Declaration on Environment and Development; the World Summit on Sustainable Development; the World Summit for Social Development; the Program of Action of the International Conference on Population and Development; the Beijing Platform for Action; and the United Nations Conference on Sustainable Development (Rio+20).

Embrapa also provides scientific knowledge as inputs for Brazil to take its position at different conferences, such as the following: Fourth United Nations Conference on the Least Developed Countries, Third International Conference on Small Island Developing States; Second United Nations Conference on Landlocked Developing Countries; Third UN World Conference on Disaster Risk Reduction and the principles of the Rio Declaration on Environment and Development, including the principle of common responsibilities. In addition, Embrapa has actively participated in discussions coordinated by the Ministry of Foreign Affairs, which lead to the Cartagena and Nagoya Protocols, within the Convention on Biological Diversity, and to the Paris Agreement, within the Convention on Climate Change.

## Contributions to the Peace dimension

According to the UN 2030 Agenda, the Peace dimension is defined as the ability to “We are determined to foster peaceful, just and inclusive societies which are free from fear and violence. There can be no sustainable development without peace and no peace without sustainable development” (United Nations, 2020).

The international community recognizes the close relationship between peace and food availability. FAO, for its part, has drawn attention to the risks of conflict caused by hunger and to the fact that sustainable agriculture and food safety are essential components for conflict resolution and peace consolidation.

Brazil is one of the main food suppliers of the planet, because of science and technology developed in its continuous search for alternatives to combat hunger and reduce poverty. In the context of Embrapa, the Peace dimension is approached based on SDG 16, which encompasses six targets (8% of the total), for which actions of Embrapa contribute directly or indirectly (Figure 8). SDG 16 fosters peaceful and inclusive societies for sustainable development through access to Justice for all and creation of effective, accountable and inclusive institutions at all levels. Technological solutions presented in all SDGs have led to increased agricultural production and improved food quality, essential requirements to avoid innutrition, malnutrition and diseases.

As part of its mission, Embrapa contributes to the Peace dimension by minimizing conflicts based on high-quality technical information provided for debates between interested parties. Examples of these efforts include actions for the conservation of ecosystems and natural resources, support for the of coexistence of traditional communities and productive activities in general (thus ensuring access, territory, food security and autonomy), access to and sharing of benefits related to genetic resources and traditional knowledge, development of low-impact technologies and alternative technological solutions for food production and income, and agroecological/economic and climate risk zoning (Zarc).

Still as part of its competences, Embrapa develops institutional governance actions and participates in the following global forums: UNFCCC, Convention on Biological Diversity (CBD) and UN Convention to Combat Desertification (UNCCD). In addition, it supports international institutions, the design and implementation of public policies and promotes the establishment of knowledge networks and partnerships, aiming at the planet’s sustainable development in all the aspects advocated by the UN.



**Figure 8.** Contributions of Embrapa in RD&I to overcome problems in agriculture in the Peace dimension, within SDG 16.

As SDG 16 concerns the creation and the maintenance of strong institutions, it is worth recalling here the values expressed in the institutional documents of Embrapa:

- **Commitment** – Committed and responsible work in doing its activities.
- **Cooperation** – Teamwork, with collaboration and cross-cutting disciplines.
- **Equity** – Acceptance and appreciation of differences in achieving the Company's goals.
- **Ethics** – Work for the common good, with respect to the human being and to integrity.
- **Excellence** – Commitment and effort to obtain high-quality results.
- **Socio-environmental responsibility** – Solutions provided for society on investments made with a commitment to the environment.
- **Flexibility** – Adaptation to changes and creative solutions to meet the needs and face the challenges of agriculture.
- **Transparency** – Actions guided by dissemination and sharing of information, thus assuring an open communication with all interlocutors.

## Final considerations

The set of universal and transformative goals and targets that make up UN's 2030 Agenda is comprehensive, far-reaching and people-centered.

Although SDGs have been classified in the five dimensions of the 2030 Agenda (People, Planet, Partnership, Peace and Prosperity), all contributions have impacted peoples as well as the planet in such a way that these dimensions cannot be set apart, which is the core of the sustainable development concept. People need natural resources and, at the same time, affect the availability and quality of these resources. The way they use these resources defines their prosperity, ability to establish partnerships, and maintain peace in the short, medium and long terms.

Embrapa assumes its role of contributing with research and innovation to consolidate the changes needed for a better world, with more respect for the environment, which is the source of life and well-being of all living species.

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