This brief series was developed in preparation for the Foresight Breakout Session of the Global Conference on Agricultural Research for Development (GCARD 2012) and the Global Foresight Hub. The briefs were written to communicate to a wider audience, such as policy makers, civil society organizations, researchers, and funders. The briefs were classified into three categories: Future Studies, Regional Update, and Visioning.

Building the 5th Strategic Plan of Embrapa 2008-2023

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Based on: Embrapa, 2007. The 5th Strategic Plan of Embrapa: 2008-2023

“The future is not written anywhere, it is to be made”, Michel Godet

Embrapa’s Challenge

In 2007 the Brazilian Agricultural Research Corporation (Embrapa) began to develop its 5th Strategic Plan, which reviews Embrapa’s priorities and concepts in order to introduce new ideas and enable a better understanding of its role, mission, objectives and future outlook. In addition to research and development, the plan tackles issues such as transfer of technology and international cooperation.

The process included analyses of documents, the external and internal environments, and institutional performance. The aim was to prepare the Corporation to face the complexities, discontinuities, uncertainties, and volatilities of its external environment and internal organization over the next 15 years.

The process was commissioned by Embrapa’s Board of Directors and led by a working group composed of Embrapa researchers with expertise in a range of themes. External consultants provided additional support. For the internal environment analysis, the working group included expectations from management and support services, in addition to those of a larger group of researchers.

Methodology

A mixed approach was adopted, including interviews, workshops, surveys and scenario studies (Figure 1). Through interviews, the Board of Directors supplied the information related to the strategic orientation on the major Brazilian agricultural demands. The external environment analysis was conducted through scenario studies and document analysis.

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Figure 1: Constructing the 5th Strategic Plan of Embrapa 2008-2023
Many players participated in this process, including state research centers, universities, private firms, agribusiness representatives and technology transfer institutions. All participants were involved in shaping the plan and helped to conduct an analysis of the strengths, weaknesses, opportunities, and threats (SWOT) of the organization that occur right before the mid- and long-term priorities are defined (Figure 1). The results of the SWOT analysis served as inputs to the workshops that followed, which defined the elements of the 5th Strategic Plan (Mission, Vision, Strategies and Objectives). The work was done on the national scale – no regional analysis as such was carried out.

Four scenarios were developed (Figure 2). They were based on two major uncertainties considered as the most critical ones: (i) uncertainties related to the international context of trade for agribusiness, with two possibilities – world integration or world fragmentation at regional or national levels; and (ii) the Brazilian environment (favorable or unfavorable) of Research, Development and Innovation (RD&I) for the National Agricultural Research System (NARS). By crossing these uncertainties, the four scenarios were as follows:

**Scenario C1 – Integrated Expansion with Global Insertion, high value-added to products and sustainable use of biodiversity:**
The NARS experiences a process of integrated expansion, developing synergistic relations among state and national institutions in order to avoid gaps and overlaps of initiatives. It is enhanced with the increasing participation in global networks of RD&I and business, as seed producers, contributing to the sustainable use of biodiversity, the dissemination of technological innovation, and high added-value within agribusiness.

**Scenario C2 – Integrated Expansion with Regional Insertion, high value-added to products and sustainable use of biodiversity:**
Despite the unfavorable international context, which limits its integration to a regional scale, the national agricultural research system experiences a process of gradual expansion and strengthening, contributing to more sustainable use of natural resources, the dissemination of technological innovation, and higher aggregate value in Brazilian agribusiness.

**Scenario C3 – Disarticulation and Regression, limited value-added to products, and predatory use of biodiversity:**
The adversity brought about by an unfavorable macro-environment, marked by limited added value and the predatory use of biodiversity are exacerbated internally by weakening and disarticulation of the NARS, which has limited reach to some niche markets nationally and regionally.

**Scenario C4 – Sectorial Expansion with Insertion in Niches, institutional integration, focus on special products and low use of biodiversity:**
The NARS does not take advantage of a fully favorable external environment and experiences a process of limited expansion to some specific segments, such as agricultural commodities. Participation is restricted to globally competitive international supply chains, with added value concentrated in some agribusiness niches, and low sustainability in the use of biodiversity.

The opportunities identified after the scenario studies included: (i) sustainable use of Brazilian natural environments; (ii) global integration with similar institutes in many continents, with Brazil increasingly seen as a global player in food production, bioenergy, and bioproducts; and (iii) energy production from biomass.

The result of the process was a vision of Embrapa as a world leader in generating knowledge, technology and innovation for the sustainable production of food, fibers and renewable energy in the context of tropical and subtropical agriculture.
Developments on technology generation and transfer

• Farming patterns
A consequence of the 5th Strategic Plan is the focus on research on agroforestry (Figure 3), i.e. systems that integrate crop, livestock and forestry production rather than agronomic products in isolation. A strong research and technology transfer effort has supported the spread of this practice, resulting in important changes in farming patterns, mainly in the Brazilian savannahs. Three important changes related to the usual practice of single cropping have been: the increased diversity of outputs obtained from the same plot; the substitution of chemical fertilizers by biological fixation of nitrogen, drastically reducing production costs; and the adoption of no-tillage systems to rehabilitate degraded pastures.

![Figure 3: Integrated crop-livestock-forest-systems](source: Fabiano Bastos/Embrapa)

• Land use changes
The 5th Strategic Plan seeks greater efficiency in land use in order to prevent further deforestation. One of the tools made available was agro-climatological zoning, which was applied to define more adequate land uses and monitor the dynamics of agricultural production. This instrument has been emphasized as a research priority since the 3rd Strategic Plan (1999 – 2003).

• Consumption of agricultural products
Trends in consumption that were identified included greater consumer demands for food quality and diversity, improved animal welfare, quality certification, and environmental sustainability. These demands brought about new challenges for Embrapa’s research goals. Examples of the efforts being made to overcome these challenges are biofortification and carrot and cassava with higher levels of vitamins.

Impacts on Embrapa’s management of Research, Development and Innovation

In defining the strategies, the prospective study considered the most relevant of society’s problems that are related to Embrapa’s mission. These problems emerged from the scenario studies. Subsequently, the strategies were used to define priorities by means of an Institutional Agenda, which focused on mid-term priorities. Finally, this Agenda fed into the definition of research programs that, ultimately, implemented the strategies. Embrapa’s research network, composed of 42 research centers throughout the country, had their own priorities defined on the basis of this study. As a result, the focus of Embrapa was more clearly defined, leading to the rationalization and management of resources. A noticeable example of this prioritization is the creation of a research center, Embrapa Agroenergy, focused on innovative technological solutions for the sustainable development of the agroenergy business. Its agenda is mostly based on production processes and includes a large network of partners from Embrapa and outside.

The research priorities defined in the 5th Strategic Plan were strongly affected by the studies and discussions with experts on scenarios, trends and public policies. For example, strong emphasis was given to bioenergy and biodiversity, as well as to smallholder farmers, including settlers from land reform and native communities (also known in Brazil as “traditional communities”). Priorities were given to developing technologies that promote added value and the sustainable use of biodiversity – strategies considered well-fitted for this specific group. For example, genetic material kept in the germplasm bank of Embrapa was used to help native communities to recover traditional seed production.
An important additional impact of the process of developing the 5th Strategic Plan is methodological, since some regional research institutes have received support to develop their own strategic plans. This is the case of DIA/MAG (Dirección de Investigación Agrícola del Ministerio de Agricultura y Ganadería de Paraguay) and INIA (Instituto Nacional de Investigación Agropecuaria de Uruguay), which had trained their staff in Embrapa.

An evaluation of the implementation of the 5th Strategic Plan is carried out and published annually. This report contains information on the social, economic and environmental impacts, including separate data on employment generation and the Internal Rate of Return (IRR). For example, in 2011 the IRR of Embrapa was R$ 8.62 for each R$ 1.00 invested.

**Impact**

Understanding of points of view and interests of its partners has enabled Embrapa to visualize the universe of its clients and to incorporate their concerns in the plan drawn up. At the same time, it was a challenge to find a convergence of interests and opinions. In addition, partners exerted a strong influence on the implementation of the strategic plan. Added value was obtained by sharing institutional resources such as researchers and facilities, promoting critical discussion among partners, and avoiding duplication of efforts. Nevertheless, Embrapa faced significant difficulties in finding legal means to establish these partnerships and to cope with their dispersed locations in a large country such as Brazil. Some issues, such as aquaculture, technology transfer, international activities, information technology and organizational management, were not adequately addressed in the plan. It is possible that the stakeholders consulted in 2007 did not emphasize these issues. A more representative set of Embrapa’s stakeholders will be involved in the ongoing 5th PDE update.