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The Ecoregional Program for Tropical Latin America

Enhancing the effectiveness of agricultural research consortia working for sustainable development in four important agroecosystems

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Sponsored by:
Consultative Group on International Agricultural Research (CGIAR)

CIAT *Convened by:*
International Center for Tropical Agriculture (CIAT)

An Ecoregional Approach for Demand-Driven Research

During the past three decades, improved crop varieties and management practices have enabled farmers to increase agricultural productivity across much of tropical America. Even so, millions of rural people, many of them women, have been largely excluded from the benefits of agricultural development.

Often, these people occupy less favorable environments, where poverty has trapped them in patterns of land management that undermine natural resources. This further limits their options for escaping poverty and also has dire consequences for others, whose livelihoods may depend on those resources.

Purpose and Products of the Ecoregional Program

The Program aims to make agricultural research in tropical America more demand-driven by improving the capacity of institutions to prioritize problems, develop and adapt appropriate solutions, and extrapolate research results within major agroecosystems. More effective priority setting will help focus research on opportunities to reduce poverty and hunger as well as protect natural resources.

The Program contributes to these aims through these products:

- Tools for setting research priorities at the regional and agroecosystem levels, based on comprehensive geographic databases
- Methodologies applicable at the landscape level
- New technology components
- Improved capacity in national institutions to set priorities based on demand from the bottom up.
- Support for adaptive research teams

To find ways out of this predicament, CIAT and other institutions in the region are integrating crop breeding with research aimed at improving the management of natural resources. The aim is to find more effective ways of intensifying agricultural production and reducing poverty, while protecting the environment.

These are complex challenges that require long-term research on topics such as soil regeneration, watershed management, market development, and policy. But the poor also need results that will put more food and income within their reach in the short term.

To ensure that research satisfies these needs, it must be demand-driven. This requires a mechanism to closely articulate the supply of services with the needs of a wide range of stakeholders. These include people in both rural and urban areas who can help do something about the natural resources needed tomorrow.

An effective way to link the supply with the demand for research is through an ecoregional approach. It can tie together the work being conducted at key sites within agroecosystems, create links across agroecosystems within the region, and connect the region with the rest of the global agricultural research system. Strategic results, methods, and technologies developed in one environment can be extrapolated to other, similar places.

The Ecoregional Program for Tropical Latin America

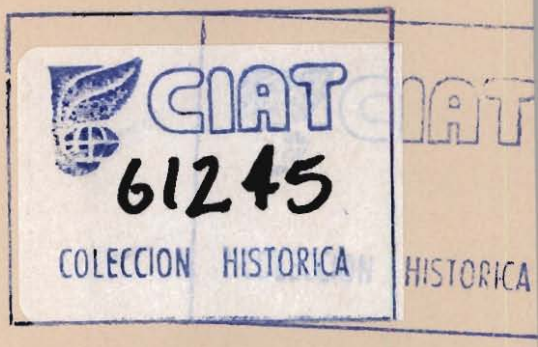
To put the ecoregional approach into practice, the CGIAR approved a proposal for the Ecoregional Program in 1995 and asked CIAT to serve as convening center. CIAT does not presume to coordinate the work of participating consortia, but rather builds links between them by providing services at the regional level and developing methodologies for the agroecosystem and landscape levels. The central aim is to minimize the duplication of effort in areas of common interest.

- The research consortia are well advanced in implementing a process of action research and development at benchmark sites.

Thus, the Ecoregional Program is helping make integrated research for agricultural development a reality in tropical America.

Who Supports the Program?

The Program gratefully acknowledges the commitment and financial support of the European Union (EU), Inter-American Development Bank (IDB), and the Swiss Agency for Development and Cooperation (SDC).



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Through a series of consultations with stakeholders in 1994 and 1995, it was decided that the Ecoregional Program should target its activities to the research consortia listed below and concentrate on a few benchmark sites in each agroecosystem.

The role of the Ecoregional Program at these sites is to help match supply with research demand, so that the agroecosystem consortia can better prioritize and target the work as well as extrapolate its results. It will also assist adaptive research teams that integrate the efforts of national and international institutions.

Research Consortia Linked v

Central American hillsides

- A consortium led by CIAT and whose other international partners are the Center for Training in Tropical Agriculture (CATIE), the International Maize and Wheat Improvement Center (CIMMYT), the Inter-American Institute for Cooperation in Agriculture (IICA), and the International Food Policy Research Institute (IFPRI).
- Concentrates on a series of watersheds from northern Honduras south to Nicaragua. At some of these sites, community associations for watershed management have been formed to articulate local institutions' demands for research with the supply from national and international organizations.

Forest margins

- A consortium linked to Global Alternatives to Slash and Burn, led by the International Centre for Research in Agroforestry (ICRAF). Also involves CIAT, the Center for International Forestry Research (CIFOR), IFPRI, and the International Livestock Research Institute (ILRI).
- In tropical America the program's benchmark site is Pucallpa, Peru, though it also works at other sites in Peru and Brazil. The research team being formed at Pucallpa represents local.

identify natural resources at risk, target research and development activities, and examine land management options.

- At Pucallpa, Peru, scientists are estimating the effects of land use on plant biodiversity and carbon emissions to provide decision makers with a quantitative basis for gauging the impact of land use policies.
- In a study on the effect of land clearing on the water balance in high-altitude natural grasslands (*paramos*), models are being used to estimate the tradeoffs between agricultural production, equity, and resource conservation.
- Researchers in the Colombian savannas are developing simple indicators of soil quality. These suggest that crop-pasture rotations maintain the soil biological and physical conditions needed for sustainable production.
- ICRISAT has screened about 1,200 improved sorghum lines for acid soil tolerance; selected lines are now being further evaluated, and a breeding program for improved tolerance is under way.
- Scientists from various institutions have obtained training in land use research and geographical information systems at CIAT.

An Evolving Program

The Ecoregional Program is still evolving, and the research consortia it supports continue to strengthen their presence and research in major agroecosystems. In early 1998 a new round of consultations will be held to monitor the work in progress, consolidate a strategy for doing research together at benchmark sites, and synthesize the lessons learned in the Program's first 2 years. Even at this early stage, the Ecoregional Program and research consortia are proving their worth.

- The Program has provided an effective mechanism for linking supply to demand in agricultural research for the region.
- A number of innovative research products are being developed that synthesize results of regional importance and examine interactions across agroecosystems.

The Program also conducts research on the interactions between agroecosystems, with a view to finding efficient ways to pool data and exchange methods across agroecosystems.

Through its work for the agroecosystem consortia, the Ecoregional Program provides a platform for interaction among CGIAR centers and their regional and national partners. It works toward this goal by linking its activities, where possible, to the work of the CGIAR's systemwide programs, which address themes such as genetic resources; integrated pest management; livestock; participatory research and gender

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national, and international institutions, whose work is facilitated by the Consortium for Sustainable Development in Ucayali (CODESU).

High Andes

- Consortium for the Sustainable Development of the Andean Ecoregion (CONDESAN), led by the International Potato Center (CIP). Also involves CIAT, CIMMYT, and ILRI.
- The consortium works at various benchmark sites in Bolivia, Colombia, Ecuador, and Peru.

Savannas

- A consortium that operates under the IICA-led Cooperative Project for Research and Technology Transfer in the South American Tropics (PROCITROPICOS). CIAT is the lead center for the CGIAR. CIMMYT, France's Center for International Cooperation in Agricultural Research for Development (CIRAD), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), the International Fertilizer Development Center (IFDC), and the French Institute of Scientific Research for Development and Cooperation (ORSTOM) also participate.
- The benchmark site is in Colombia's Eastern Plains, with an associated site in Brazil.

analysis; and soil, water, and nutrient management.

In addition, the Ecoregional Program draws on the support and expertise of organizations in developed countries (currently Germany, the Netherlands, and the USA). The Program will also maintain close ties with the new Capital Fund for Agricultural Research in the Americas, which is being set up by the Inter-American Development Bank (IDB). This new fund will clearly be a major forum for defining research priorities in the region.

Research Highlights

- To provide a stronger basis for setting research priorities, specialists in geographical information systems (GIS) are producing digital maps of major crops (such as maize, potatoes, and soybeans) throughout tropical America. This work is being done in collaboration with ministries of agriculture and other government organizations.
- Two hundred agricultural professionals throughout the region are taking part in a comprehensive land degradation survey, with a view to developing a continental database.
- In conjunction with the mapping of crops and land degradation, GIS specialists are collecting and refining population data for Latin America. The resulting databases will provide a powerful tool for examining the relationship between population pressure, crop production, and threats to natural resources.
- In cooperation with IFPRI, the Ecoregional Program is using those databases for regional analyses connected with research priority setting.
- An electronic database of sustainability and environmental indicators has been developed that will help decision makers monitor and plan agricultural development at various scales in Latin America and the Caribbean.
- Through a country case study in Honduras, techniques for producing decision-support systems are being developed that will better enable local and national organizations to