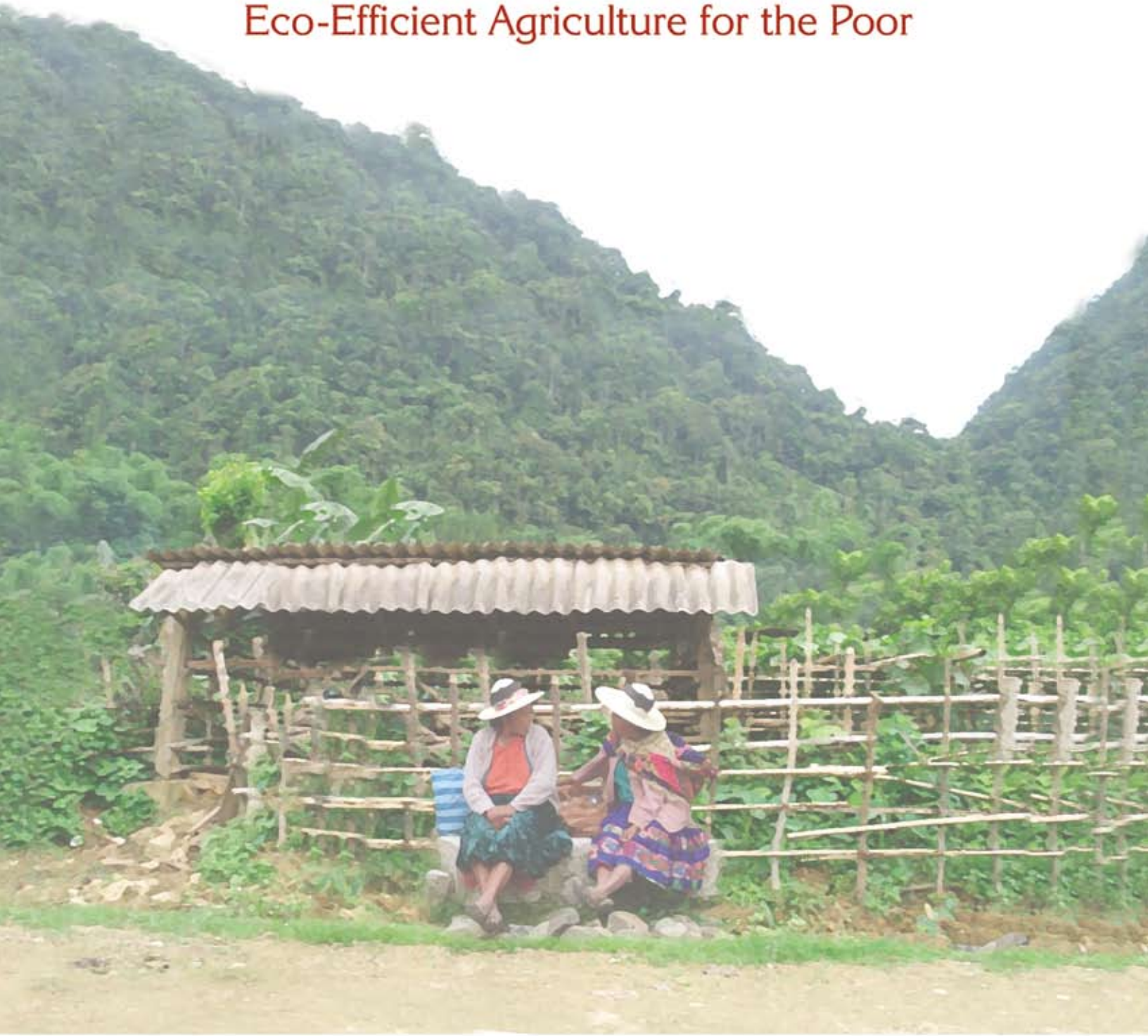
INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE

Strategic Directions

Eco-Efficient Agriculture for the Poor



CIAT

Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture
Consultative Group on International Agricultural Research

February 2009

CIAT's Strategic Directions

Overview

This document describes the strategic directions that will guide CIAT's work in the coming years. They have been drawn up at a time when both the Center and the international agricultural research system supported by the Consultative Group on International Agricultural Research (CGIAR) are going through profound change. These strategic directions are intended to provide a compelling framework for program development on the basis of CIAT's strengths and experience, while allowing sufficient flexibility to shape the Center's future in accordance with the evolution of the CGIAR.

The development of this document has involved consultations with many partners and stakeholders, particularly in Latin America and the Caribbean (LAC); participation in the CGIAR change process; careful consideration of the recommendations of the 2007 External Program and Management Review of CIAT; the commissioning of special studies, including some by external consultants; and a series of planning exercises carried out by CIAT's scientists and Board of Trustees. Further details about the process are available on the Center's Web site (www.ciat.cgiar.org).

The strategic directions outlined here provide a compass to guide CIAT towards the future rather than a detailed road map or rigid plan. The specific outputs, resource assignments, and organizational structure of CIAT will emerge over the coming months and years through a process of refinement and adjustment, influenced largely by three forces: (1) the priorities and commitments of partners, (2) the CGIAR change process, and (3) funding commitments. The Center expects to play a constructive role in a revitalized CGIAR, bringing unique strengths and assets to new programs that address major global challenges.

CIAT's ultimate goal is to help overcome the challenges of hunger, poverty, inequality, and environmental degradation in the developing world through science and new knowledge. Its strategy derives from a new vision of eco-efficient agriculture, which benefits the poor by delivering sustainable increases in productivity; by better enabling family farms to compete in markets; by limiting damage to natural resources both within and beyond agriculture; and by showing resilience in the face of environmental shocks, particularly climate change.

In pursuit of this vision, CIAT will strengthen longstanding partnerships in its home region, LAC, generating international public goods that are relevant to LAC and to the tropical world generally. Through a strategy based on three pillars—(1) improved crops for the poor, (2) improved soil fertility management, and (3) programmatic alliances with Latin America and the Caribbean—the Center and its partners will help create the conditions that are essential for making tropical agriculture more eco-efficient.

Geoffrey Hawtin
Director General

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Chairman, Board of Trustees

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Director General Elect

Background: Responding to New Challenges for World Agriculture

Improving agriculture is vital for meeting the challenges of hunger, poverty, inequality, and environmental degradation in the developing world. To contribute to improvements that matter for the poor, in a world of rapidly depleting resources, CIAT will pursue a new vision of an agriculture that uses inputs more efficiently to enhance productivity and competitiveness—that is, a more "eco-efficient" agriculture.

Eco-efficient agriculture uses resources more effectively to generate sustainable increases in productivity and more abundant food supplies. It enables family farms to compete in local and regional economies, thus reducing poverty. It limits the natural resource degradation caused by agriculture, thereby diminishing its negative ecological footprint. Eco-efficient agriculture is resilient in the face of environmental shocks, such as climate change. It also contributes to greater equity in rural areas, for example, by creating new opportunities for women in agriculture.

The aims of eco-efficient agriculture are important for the three "worlds of agriculture"—urbanized, transforming, and agriculture based—which are described in the World Bank's *World Development Report 2008* and are found throughout the tropical regions of Africa, Asia, and LAC. The latter encompasses all three: Agriculture in southern Brazil and northern Mexico, for example, is strongly oriented to urban markets, while the Andean and Central American countries present a patchwork of transforming and agriculture-based economies.

Because the agriculture of tropical countries shares so much in common—in terms of crops as well as agro-ecological and socio-economic conditions—South-South scientific exchanges can accelerate agricultural development. Such exchanges are especially important given the growing gap between a few large urbanized countries (like Brazil, China, and Mexico), which have a strong ability to harness advanced science for agricultural innovation, and a large number of poorer, agriculture-based or transforming countries, whose agricultural research capacity is more limited.

The global system of international agricultural research supported by the CGIAR facilitates exchanges between those diverse and evolving national agricultural systems. Currently, the CGIAR is implementing far-reaching reforms in its governance, funding, and partnerships, which will enhance its effectiveness. These reforms will also shape CIAT's future—both its scientific programs and strategic alliances. This document presents a broad strategy by which CIAT will address major global challenges and contribute to the revitalization of the CGIAR.

CIAT's mission is to reduce hunger and poverty and improve human health in the tropics through research aimed at increasing the eco-efficiency of agriculture. To speed progress toward an eco-efficient agriculture, CIAT and the CGIAR will work with partners towards achieving the following objectives:

1. Boost agricultural productivity to provide the poor with inexpensive and nutritious food.
2. Make agriculture more competitive, offering the poor new opportunities to increase their incomes.
3. Achieve agricultural growth that is sustainable and less harmful to the environment.

Over the next decade, these objectives will guide CIAT's research and reinforce its commitment to ensuring that products of research reach their intended end-users: farmers, development practitioners, scientists, and policy makers. CIAT's research will be fully consistent with the CGIAR's three strategic objectives, as defined by its recent Change Management Initiative: food, environment, and policy for the poor.

Charting CIAT's Research Directions

Playing a unique role in the CGIAR system, CIAT will work with partners in LAC and elsewhere to help create conditions that are essential for making agriculture more eco-efficient through a strategy based on three pillars. The first two are global in scope and relevant to LAC, while the third pertains specifically to this region, albeit with the intention of producing globally significant international public goods and promoting South-South linkages between LAC and other regions.

1. ***Improved crops for the poor***—Providing affordable and nutritious food as well as pathways out of poverty.
2. ***Improved soil fertility management***—Overcoming one of small farmers' greatest obstacles to sustained increases in agricultural production.
3. ***Latin America and the Caribbean***—Working with partners to solve problems of high priority for the region, while also generating global public goods.

Improved crop and forage production is vital for improving food security, enhancing human nutrition, and raising agricultural incomes. While especially important for agriculture-based countries, this is also a high priority for transforming and urbanized economies. Across much of the tropics, crop and forage yields are depressed by low soil fertility, which is especially acute in Central America but also widespread in sub-Saharan Africa and South America's vast savannas.

Crop improvement and soil fertility management are closely related. Improved varieties can be adapted to low soil fertility through more efficient use of soil nutrients, and legumes, such as beans and many tropical forages, can improve soil fertility through biological nitrogen fixation. Crop yields tend to vary greatly according to management, so there is much scope for improving productivity through better agronomic practices. Better management of crop residues and integration of forages into cropping systems can also increase soil organic matter, boosting productivity while helping mitigate climate change through carbon sequestration and reduced greenhouse gas emissions.

Research on these topics in LAC has much to offer the rest of the world. Major crops in the region, including beans, cassava, and tropical forages are also important globally, and LAC's main soil constraints occur throughout the tropics. LAC is also favored with strong national agricultural research systems (NARS), a vibrant tradition of community-based development and an active private sector.

In its research with partners there and elsewhere, CIAT will operate according to the five principles described below:

Achieving impact—CIAT's research delivers impact through products that better enable end-users to make agriculture more eco-efficient. For this purpose, Center scientists characterize the needs and opportunities of the rural poor (with emphasis on food security and stronger market links) and encourage their participation in evaluating new options. Innovations are thus developed with farmers and other actors in value chains as well as with national research systems. The design of effective research delivery systems is itself a subject of CIAT research, as is impact assessment, which contributes importantly to institutional learning and change.

Advancing gender equity—Rural poverty cannot

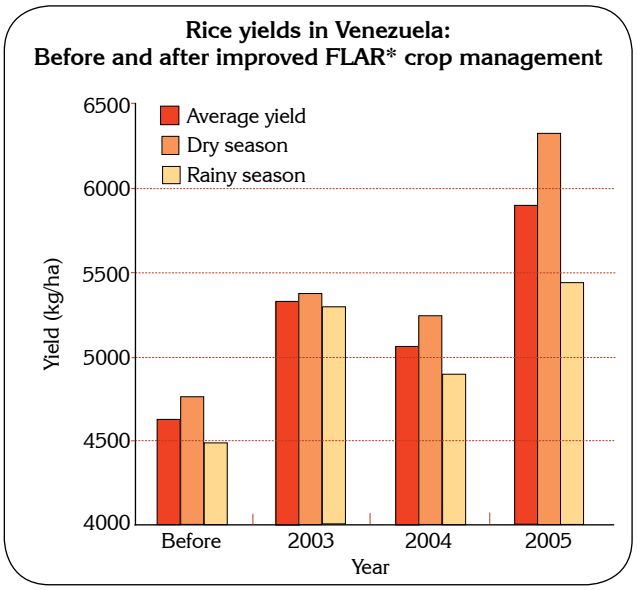
To date, nearly 6.5 million households in Africa have adopted improved beans, benefitting over 35 million people—mainly women.

be reduced without research that is sharply focused on gender issues in agriculture, especially the feminization of rural poverty, which occurs throughout the tropics, including LAC. This is a result of women's limited access to resources in agriculture, including land, capital, and technical assistance, as well as to education and urban employment. CIAT's research offers marginalized rural women new income-earning opportunities, which can have a major impact on children's nutritional status and development.

Fostering environmental sustainability—Agriculture depends on natural resources, like biodiversity, soil, and water, but all too often impacts them negatively. Better management of those resources is needed to make agriculture more sustainable and prevent major negative environmental impacts beyond agriculture. Toward that end, CIAT research seeks to better understand such impacts and develop mechanisms whereby rural resource managers, especially the poor, can gain tangible incentives to enhance environmental services.

Strengthening partnerships—Collaboration with NARS, advanced research institutes, and other CGIAR centers is essential for effective research, while the contributions of farmer organizations, NGOs, and the private sector are key for achieving development impact. To be effective, partnerships must be based on common goals, shared resources and responsibilities, and complementary strengths. CIAT will seek stronger partnerships, in which it plays diverse roles, assuming responsibility and leadership for particular research endeavors, providing overall coordination or offering support to others—for example, by strengthening research capacity or convening research alliances. CIAT partnerships will be globally inclusive, but with a focus on LAC with, for example, a particular commitment to work with regional partners like the Colombian Corporation of Agricultural Research (CORPOICA).

Managing and sharing knowledge—The Center has a strong record of making relevant data on agricultural development available to end-users. To enhance the effectiveness of its own work and that of its partners, CIAT aims to enhance its role as a key international knowledge center, promoting development of the institutional capacities and individual skills needed to take advantage of new information and technologies.



* Latin American Fund for Irrigated Rice.

Improved Crops for the Poor

By 2030, grain production will have to increase by 50 percent and meat production by 85 percent to meet projected global demand. Genetic improvement of crops, involving practical integration of biotechnology with conventional breeding, will continue to be vital for enabling agriculture to keep pace.

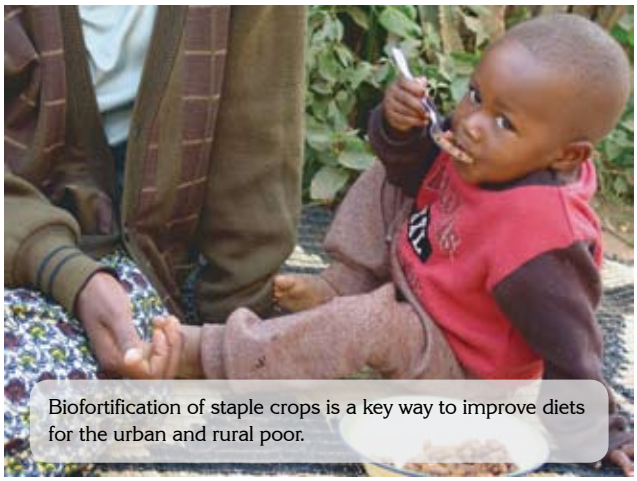
CIAT and its research partners have an impressive record of impact through crop improvement research in LAC, Africa, and Asia, focusing on crops that originated in LAC. The Center is uniquely placed to study and use the genetic resources of these crops. CIAT will continue to safeguard, enhance, and make freely available the world's largest collections of genetic resources of beans, cassava, and lowland tropical forages, collaborating in particular with Bioversity International, the Center for Tropical Agronomic Research and Higher Learning (CATIE), the Brazilian Agricultural Research Corporation (Embrapa), the International Livestock Research Institute (ILRI), and the International Institute of Tropical Agriculture (IITA). Like other collections maintained at CGIAR centers, those at CIAT headquarters are held in trust for humanity under the terms of the International Treaty on Plant Genetic Resources for Food and Agriculture. In its rice research, CIAT will take advantage of the world's largest and most important in-trust collection of rice held by the International Rice Research Institute (IRRI). CIAT

will work with IRRI to ensure that wild and cultivated rice germplasm of LAC origin is conserved in the IRRI collection.

CIAT will conduct research in LAC and through partnerships around the world on four globally important crops:

1. ***Common bean***—The world's most important food grain legume, which in Africa is grown mainly by women.
2. ***Cassava***—The third most important food crop in the tropics, after rice and maize, and second only to maize in its suitability for multiple uses.
3. ***Tropical forages***—A key input for production of meat and milk (LAC's most important high-value agricultural products), with much potential for enhancing natural resource management (NRM).
4. ***Rice***—The most important staple food in South America and the world. CIAT research focuses on the unique characteristics of rice in LAC, while IRRI and the Africa Rice Center (WARDA) concentrate on Asia and Africa.

In this research, CIAT will emphasize adaptation to low soil fertility and climate change, together with enhancement of nutritional quality and traits that increase crop marketability. The importance of improving adaptation to low soil fertility has already been mentioned. As for climate change, CIAT will strengthen its modeling research to better understand and predict likely effects on agriculture. Crop traits that are important for climate change adaptation include tolerance of extreme temperatures (in beans and rice), increased water-use efficiency (in beans, cassava, and rice),



Biofortification of staple crops is a key way to improve diets for the urban and rural poor.

flooding tolerance (in forages), and resistance to pests and diseases, whose dynamics will be altered by climate change. CIAT researchers will develop some of those traits with the CGIAR Generation Challenge Programme.

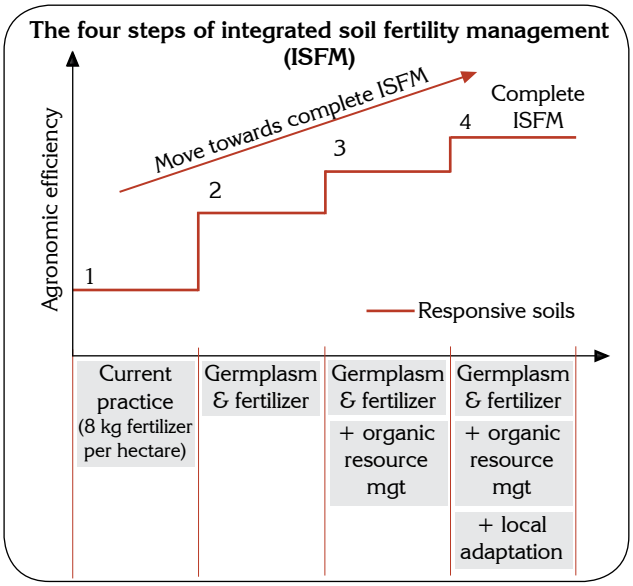
There is huge potential for improving crop product quality through genetic improvement. Increasing micronutrient content, or crop biofortification, for example, can help overcome malnutrition. Iron deficiency is a particularly serious problem for women; while lack of vitamin A contributes substantially to vision loss and impaired immune system functioning; and zinc deficiency stunts child growth. Conventional approaches for addressing those problems, such as vitamin supplements, entail significant recurring costs and often do not reach the poor. To complement such approaches, CIAT assigns high priority to nutritional quality—specifically vitamin A in cassava and iron and zinc in beans and rice—in breeding work that forms part of the CGIAR HarvestPlus Challenge Program and the LAC-focused AgroSalud Alliance. In addition, Center researchers improve traits related to crop marketability, such as unique starch qualities in cassava, which can enhance its value for a variety of agro-industrial purposes, including the production of bio-ethanol.

CIAT's strategic crop improvement work includes related research on product and information delivery systems and on policies and institutional mechanisms needed to ensure that the work is well targeted and achieves impact.

Improving Soil Fertility Management

The use of mineral fertilizers is necessary but not sufficient to achieve high and sustainable crop productivity in tropical soils. Long-term experiments show that, when fertilizers are applied without organic inputs, crops gradually lose the ability to efficiently take up soil nutrients. The Four Step of Integrated Soil Fertility Management (ISFM) combines fertilizer with the use of adapted germplasm and organic inputs, such as livestock manures and growing legumes. Partnerships for research on ISFM, which is critical for increasing the eco-efficiency of agriculture, are needed in LAC and particularly for the creation of a regional platform for CGIAR soils research in Africa, which is the world's most food insecure region, partly because of major soil constraints.

In addition to boosting crop productivity and raising the efficiency of mineral fertilizer use, improved management



Integrated soil fertility management (ISFM) is dramatically increasing crop productivity for farmers across Africa by combining improved seeds with fertilizer, organic resource management techniques, and local farming practices.

of soil organic matter can enhance ecosystem services and mitigate climate change. In pursuit of those possibilities, CIAT researchers will design and test management options that increase soil carbon under diverse land management systems, using new methods that integrate information from the farm to watershed levels. They will also devise systems for monitoring the impacts of improved management on carbon sequestration and other ecosystem services, such as water management. These systems will help analyze productivity-conservation tradeoffs in the management of organic resources, thus providing a stronger technical underpinning for institutional innovations, such as payment for environmental services.

Nitrogen deficiency—a common and significant constraint of food production in the tropics—results from continuous cropping, soil erosion, and loss of this nutrient to the atmosphere. To help overcome that constraint, CIAT researchers will enhance the nitrogen-fixing capacity of beans and forage legumes; evaluate alternatives for incorporating legumes into tropical cropping systems; and explore practices for better managing the factors that influence nitrogen fixation. This research will help make agriculture more eco-efficient by lessening the need for mineral fertilizers (thus lowering farmers' production costs and making agriculture more competitive) and by reducing emissions of nitrous oxide, a highly potent greenhouse gas.

Latin America and the Caribbean

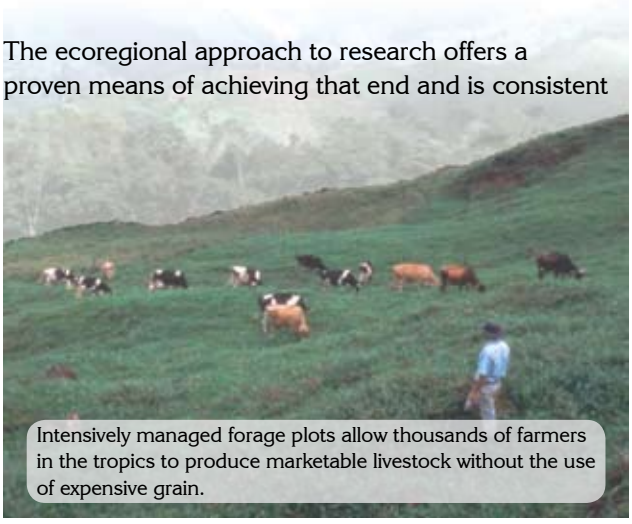
Ecoregional Research with Global Relevance

In charting its new strategic directions, CIAT has consulted with a large and diverse group of public and private sector organizations across LAC. From this consultation, a research agenda has emerged that responds to regional priorities in LAC and that complements and underpins the Center's work in sub-Saharan Africa and Southeast Asia. CIAT will focus its research on issues of special importance for LAC, in addition to the more general work on improved crops and soil fertility discussed above. Through South-South partnerships, CIAT will conduct research and promote the inter-regional transfers of results, linking LAC with the rest of the world in a two-way exchange.

The agricultural environments of LAC are highly diverse, varying in their resource endowments, production systems, and market orientation. To some degree, LAC reflects the complete evolution from agriculture-based through transforming to urbanized economies. LAC thus provides fertile ground for generating global public goods that are highly relevant to its own agricultural development but are also likely to be useful in many parts of Africa and Southeast Asia.

It is equally important that LAC have means of tapping experience elsewhere in the South, such as Africa's success in devising informal seed systems, its progressive work on gender analysis and Asia's advances in smallholder production of cassava for livestock feed. Flows of technical and institutional innovations between LAC and other regions will not happen automatically but must be deliberately fostered.

The ecoregional approach to research offers a proven means of achieving that end and is consistent



Intensively managed forage plots allow thousands of farmers in the tropics to produce marketable livestock without the use of expensive grain.

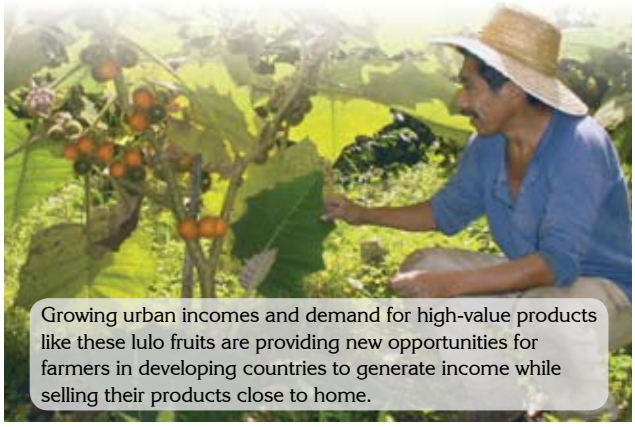
with the expressed needs and demands of the LAC region. An ecoregional approach is one that integrates the aims of increased agricultural productivity and improved NRM, taking into account both the biophysical and socio-economic perspectives, through inter-institutional partnerships. The agenda of CIAT's ecoregional research will focus on four main topics:

1. Improvement of crops that are important in LAC but also globally.
2. Improvement of other crops that receive high priority in LAC.
3. NRM and policy research on issues that receive high priority in LAC.
4. Strengthening research capacity in the region through institutional innovation, knowledge management, and skills enhancement.

While appreciating the importance of conserving and improving beans, cassava, rice, and tropical forages, CIAT's partners in LAC are also calling on the Center to extend its crop research to include support for work on a wider array of species, particularly of tropical fruits and other high-value crops including biofuels that are important throughout the region. LAC partners also expressed keen interest in having CIAT make biotechnology tools more accessible in the region and apply them to issues of relevance to small farmers.

For this purpose, the Center will work with partners to establish a biotechnology research platform for LAC, in which public-private partnerships figure importantly. CIAT will also respond to the interest of many countries in developing improved bio-energy systems.

CIAT's partners in LAC have further requested that the Center expand its research on environmental issues, for example, through efforts such as the Amazon Initiative. Partners similarly assign high priority to soils research and to the conservation of genetic resources. Another area of high interest involves policy research on payment for ecosystem services, such as carbon sequestration and improved water management, which are critical for making agriculture more eco-efficient. CIAT will consult with partners in the region (including universities, national research institutes, farmer associations, and the private sector) and within the CGIAR to determine how best to address these challenges through collaborative research. In this work, the Center will give high priority to the Amazon as well as to the acid-soil savannas of South America, working



Growing urban incomes and demand for high-value products like these lulo fruits are providing new opportunities for farmers in developing countries to generate income while selling their products close to home.

with partners in Brazil and Colombia, especially Embrapa and CORPOICA. Likewise, CIAT will focus on the hillsides of Central America in collaboration with CATIE and on the Andes in partnership with the International Potato Center (CIP).

In its ecoregional role, CIAT will help reverse the erosion of research capacity that has occurred in some countries by helping build a new generation of agricultural scientists and renewing the skills of midcareer scientists. The Center will also explore new roles for large NARS and seek to incorporate large and small NARS into ecoregional networks. In addition, CIAT will work on research policy, focusing on impact assessment for research planning. In these efforts, CIAT will seek opportunities to work with a wide array of partners, including the International Food Policy Research Institute (IFPRI), CATIE, the Inter-American Institute for Cooperation on Agriculture (IICA), the Forum for the Americas on Agricultural Research and Technology Development (FORAGRO), the Regional Fund for Agricultural Technology (FONTAGRO), subregional cooperative research programs, national universities, the US Land-Grant System, and European agricultural universities.

Key Partnerships

Under CIAT's new strategy, essentially all of its ecoregional and global research will be conducted through partnerships with a wide array of institutions, including national research institutes, farmer and community organizations, advanced research institutes, the private sector, and development agencies. The Center will particularly emphasize, however, the three keystone partnerships described below.

LAC biotechnology research platform—To be established with partners in LAC, the biotechnology platform will exploit the potential of molecular biology and genetic transformation in research on crops for which the center is responsible as well as on other species to which our regional partners assign high priority.

National scientists hosted by the platform will form part of a scientific community that consists of CIAT researchers working on the Center's CGIAR mandate crops as well as colleagues from other programs in the region dealing with a wider array of crops and problems. Not all of the research associated with the platform will be conducted at CIAT headquarters but rather at facilities around the region and in advanced research laboratories outside the region, with which the platform will be linked. As members of the global CGIAR network, research partners will gain opportunities for training and scientific exchanges, thus strengthening national research capacity.

CIAT has piloted the concept of a biotech platform with partners in Colombia, in particular CORPOICA and with CATIE, and the outcomes have been positive. Brazil, Mexico, and Argentina, among others, can bring much strength to this new kind of partnership, and it is expected that scientists from those countries, some of them hosted at CIAT facilities, will share their expertise with scientists from smaller NARS. In designing the platform, CIAT will benefit from the experience of Biosciences Eastern and Central Africa (BECA) and explore options for collaboration with this initiative.

The platform will focus on problem-solving research that yields clear impacts in the field and marketplace.

Over the years, CIAT has trained almost 11,000 young scientists from around the world.

CIAT support for practical applications of biotechnology will focus on valuable plant traits, such as efficiency in water uptake and nitrogen use, acid-soil tolerance, disease and pest resistance, and micronutrient content. The Center will link crop improvement aided by biotechnology with the efforts of public-private partnerships to carve out niches for small farmers in important growth markets, such as those for milk, tropical fruits, and bioenergy.

CGIAR regional platform for soils research in sub-Saharan Africa—Essential for the eventual success of ISFM in the region, this platform will build on the African Network for Soil Biology and Fertility (AfNet). Coordinated by CIAT's Tropical Soil Biology and Fertility (TSBF) Institute, AfNet consists of dozens of members working at more than 100 sites in 22 countries. The proposed platform will seek to catalyze the creation of a soils research facility uniting national organizations with all of the CGIAR centers that conduct research on soils in rainfed farming systems, including the International Maize and Wheat Improvement Center (CIMMYT), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), IITA, and the World Agroforestry Centre (ICRAF). The aim of the platform will be to bring research on soil management more forcefully to bear on the challenges of reducing hunger and poverty, while enhancing NRM in sub-Saharan Africa.

As the regional platform takes shape, Africa and the rest of the developing world will benefit from closer collaboration between the best international and national soil scientists and from improved facilities and funding for their work. A consolidated soils research platform in Africa, linked to similar research in LAC and Asia, is arguably the best hope for making ISFM a prominent feature of agricultural research in Africa and beyond and for bringing this approach within the reach of large numbers of farmers.

Public-private partnerships—By bringing together international and national research institutions with community-based organizations as well as private companies, these partnerships help ensure that research results match stakeholder priorities, while guaranteeing that partners share the costs and benefits of joint efforts.

CIAT has gained much experience in building such partnerships over the last decade or so. Two outstanding examples are the Latin American and Caribbean Consortium to Support Cassava Research and

Development (CLAYUCA) and the Latin American Fund for Irrigated Rice (FLAR). They have achieved effective governance under member control, sustained funding from members, and useful results through international research that meets user demands. CIAT will explore the possibilities for creating new partnerships in LAC and other regions, with some focusing on joint research and others on better linking CIAT research with development. Such partnerships should offer important opportunities for testing the concept of eco-efficient agriculture on the ground.

In Pursuit of Revised Research Directions

CIAT's pursuit of the three main research directions outlined in this document will mean a significant shift in the content of its work and in the character of its partnerships. The Center will, for example, sharpen the focus of its research on genetic improvement of crops. As partners assume greater responsibility for plant breeding, CIAT will concentrate more on developing source materials with desirable traits, from which partners can assemble final products. This shift is already well advanced with rice in LAC, where FLAR carries out an increasing share of breeding formerly done by CIAT, leaving Center researchers to focus more on prebreeding, aided by the work of IRRI and the Africa Rice Center and by partnerships with advanced institutes, such as the French Agricultural Research Centre for International Development (CIRAD) and the Institute of Research for Development (IRD).

Similarly, in cassava improvement, IITA, Embrapa, and the Thai Tapioca Development Institute (TTDI) will concentrate on developing varieties for release to farmers, while CIAT focuses more on prebreeding of widely relevant traits, such as improved nutritional value and starch quality. Breeding of Brachiaria grass will take place through partnerships with national institutes like CORPOICA and Embrapa as well as with private companies. Forage legumes will be improved for nitrogen fixation, nutritional quality, and nutrient cycling through research in which ILRI figures as an important partner. Bean research will be carried out through well-established networks, including the Pan-Africa Bean Research Alliance (PABRA). Much of CIAT's soils research will take place in the framework of the regional platform described earlier. The Center will also continue to provide leadership, together with IFPRI, to the CGIAR HarvestPlus Challenge Program.

Improved cassava yields and agronomic practices have generated US$1 billion in additional income for about 1 million households in Southeast Asia.

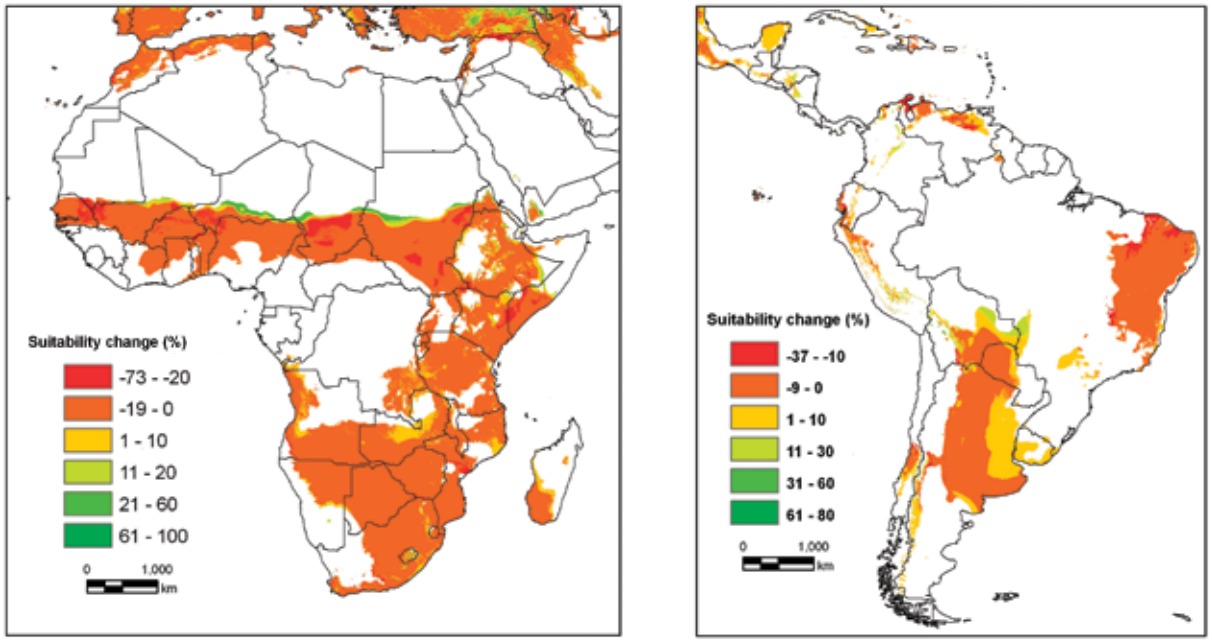
Research on crop and agro-ecosystem health, which figured importantly in CIAT's work over the last decade, will be reduced in some areas and redirected in others. Development of biopesticides and research on endophytic fungi and bacteria, for example, will be discontinued, while work on whitefly will be scaled down. Any further research in those areas will take place in collaboration with the CGIAR Systemwide Program on Integrated Pest Management. CIAT will continue to develop genetic resistance to the most important pests and diseases of its mandate crops.

The Center's research on NRM will be sharply focused on ISFM, while work on land-use dynamics and decision-support for landscape management will be discontinued. Research on remote sensing to monitor land-use changes has already been phased out, along with research on community-level watershed management.

In recent years, rural innovation has been a pillar of the Center's research strategy, resulting in new participatory research methods and a territorial approach to agro-enterprise development. Those products are now used in CIAT's own research and are being widely applied by partners as well. While the Center will continue to use and promote participatory approaches as a way of achieving impact, it will no longer conduct research on these methods.

CIAT will consult closely with partners in 2009 about the content and collaborative basis of future work. The biotechnology platform, for example, will require new agreements with partners in LAC, while additional public-private partnerships will depend on new commitments from regional stakeholders. Likewise, to advance the idea of a soils research platform in Africa will involve extensive consultation with other CGIAR centers and partners.

Change in the suitability of bush beans by year 2020



CIAT's long-term breeding strategies are taking into account climate change in order to ensure maximum relevance of our research products in a highly dynamic and changing world.

As the CGIAR develops the new strategy and results framework and new research programs called for by the recently approved reform proposal, CIAT will strengthen its current collaboration with other Centers and Challenge Programs.

In concentrating its efforts around the three research pillars described above, CIAT will need to make adjustments in its structure and organization. The Center will maintain its world-class capacity in genetics, soils, and geographical information systems, while adding or restoring capacity in bioinformatics and the social sciences. Greater capacity in the latter area is critical for priority setting and for achieving and assessing impact, especially on poverty and gender equity. CIAT will define the focus of its research more specifically in forthcoming medium-term plans, and it will devise business plans describing how specific research outcomes can be delivered.

With support from CGIAR Members and the new CGIAR fund to be created in 2009, CIAT will be able to implement the strategic directions set out here. At the same time, the Center's revised ecoregional approach should open up important opportunities for resource mobilization within LAC. Increased investment by countries in the region as well as by entities like the Inter-American Development Bank (IDB) and Andean Development Corporation (CAF) is a clear possibility. Further significant support will likely come from new public-private partnerships, created in response to regional priorities and market signals. To a growing degree, responsibility for implementing and funding CIAT's research in LAC will be shared with regional stakeholders.

The Center will continue substantial parts of its research in Africa and Southeast Asia. Its work in both regions is based on longstanding partnerships with NARS and tackles issues that are important regionally as well as globally and are linked to CIAT's work in LAC. These partnerships have attracted a wide range of strongly committed donors. CIAT and its partners also see great potential for South-South collaboration both in crop improvement and research on soil fertility management.

CIAT believes that the time is ripe to focus on eco-efficiency in tropical agriculture, as multiple world crises —in the climate, food, energy, and financial systems— underscore the need to achieve far more efficient use of scarce resources, so that everyone can enjoy their right to an adequate diet and livelihood. ■

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