



International Center for Tropical Agriculture  
Since 1967 / *Science to cultivate change*

30 August 2013

## **About CIAT's Strategic Plan for Stakeholder Consultation**

In 2008, CIAT established new strategic directions, which make the notion of eco-efficiency a guiding principle of our research on tropical agriculture. As we prepare a new strategy for 2014-2020, it is even more apparent than it was 6 years ago that multiple crises – global commodity price swings, rapid depletion of natural resources, and the emerging impacts of climate change – are greatly increasing the pressure on farming in the tropics. To respond successfully, agriculture will have to become far more eco-efficient – delivering more for people while requiring less from the land.

How CIAT works toward this aim will be influenced by major changes in CGIAR – the international agricultural research partnership that encompasses CIAT and 14 other centers. CGIAR has embarked on 16 major global research programs, which are the primary means by which the centers and their partners work together to achieve shared development objectives. Rapid advances in science and technology are creating new opportunities to make this research more effective, so that it delivers solutions to a wide range of problems in less time and at lower cost.

### **1. Addressing Global Challenges**

One of the first steps in CIAT's strategic planning process was to review in consultation with a panel of external experts the assessment of global agricultural trends carried out in 2012 by the Food and Agriculture Organization of the United Nations (FAO). In light of those trends and CIAT's mission, we defined three main challenges to which the Center's work is especially relevant:

- Meeting increased demand for food among poor consumers, while also addressing malnutrition and other health problems related to food consumption
- Reversing the degradation of natural resources through new knowledge that leads to sustainable intensification of farming
- Finding ways to address global climate change effectively in agriculture through both adaptation and mitigation

A further challenge we identified that cuts across those three is to strengthen the human resource capacity of key research partners in countries where CIAT works and in agricultural research for development generally.

Over the last year or so, CIAT scientists and partners have developed more fully our shared vision of eco-efficient agriculture. On that basis and taking into account the

Center's main comparative advantages for applied research in the tropics, we have set three strategic objectives for our global collaborative efforts to address the challenges listed above:

- ***Better enable the rural and urban poor to access inexpensive, high-quality food by boosting agricultural productivity and enhancing the nutritional quality of staple crops.***
- ***Promote rural income growth by making smallholder agriculture more competitive and market oriented through improvements in agricultural value chains.***
- ***Provide the means to make a more intensive and competitive agriculture both environmentally sustainable and climate smart.***

**Question 1 – Do you think these objectives respond adequately to the global challenges outlined above? If not, what would you change or add?**

CIAT will work toward its objectives through collaborative applied research that contributes strategically to CGIAR research programs, drawing on the Center's core competencies. CIAT has longstanding strengths in the genetic improvement of beans, cassava, rice, and tropical forages, relying on biotechnology tools and well-managed genetic resources. It has also built formidable capacities in research on integrated soil fertility management, soil health, and sustainable land management as well as spatial and policy analysis aimed at linking farmers to markets, enhancing eco-system services, and promoting climate change mitigation and adaptation. Other areas in which CIAT has important expertise include gender analysis, impact assessment, knowledge management, and capacity strengthening.

## **2. Strategic Initiatives**

While continuing to develop and apply its core competencies in the coming years, CIAT will also embark on a series of forward-looking strategic initiatives, designed to advance eco-efficient agriculture in new and more powerful ways over the longer term. Made possible by exciting developments in science and technology, these initiatives will draw on emerging ideas, knowledge, and trends, with the aim of adding value to ongoing research. Described briefly below are the strategic initiatives currently under consideration.

### ***Tropical forages for a triple win – LivestockPlus***

Over the last 2 decades, growth in livestock production has gained huge momentum in developing countries, driven by population increase and rising urban incomes. A major

challenge for these countries is to sustain their livestock revolution – thus providing more food for consumers and income for farmers – without destroying natural resources and raising the sector’s greenhouse gas emissions, which account for half of all agricultural emissions.

Contrary to the widespread notion that livestock belong in the minus column of any food security and environmental calculation, CIAT scientists are convinced that a new approach called LivestockPlus can deliver the triple win of better livelihoods, environmental improvement, and a safer global climate.

About 70% of the world’s agricultural land is used to provide feed for livestock. Through large-scale deployment of improved tropical forages on these lands to provide higher quality feed, LivestockPlus aims to double meat and milk production on less land, restore degraded soils to health, sequester large amounts of carbon – on a scale similar to that of forests – and reduce emissions of nitrous oxide and methane per unit of livestock product.

### ***Sustainable food systems for an urbanizing world***

More than half the world’s population lives in urban areas, and by 2050, this figure will have risen to 67%, on average. Growing, urbanizing, and ageing populations have major implications for food consumption and agriculture. The challenge is to achieve efficient distribution of low-priced, nutritious, and safe food, while making agricultural value chains work better to reduce demand pressure on global food supplies.

This strategic initiative will analyze evolving patterns and preferences in food consumption, seek better ways to integrate value chains, and explore policy options for managing them better. The research impacts will include reduced food waste, improved access to high-quality, nutritious, and safe food at affordable prices for the benefit of the poor urban consumers. In addition, food producers will benefit from having clearer market signals and increased marketable volumes.

### ***Gauging the human dimension of ecosystem services***

Ecosystem services – which include water and food supplies, biodiversity preservation, climate change mitigation, and even recreation – are enormously important for global society. For that reason, research has so far focused mainly on determining their monetary value, based on an adequate understanding of their biophysical dimensions, with the aim of curbing resource degradation.

Farming communities are responsible to a large degree for maintaining ecosystem services. So, it is also imperative to understand how they benefit from the services either directly or indirectly in terms of food security, dietary diversity, income, human

health, and culture. For CIAT, it is particularly important to learn how more eco-efficient agro-ecosystems can enhance communities' livelihood resilience and adaptive capacity.

To answer those questions requires a more integrated research framework that fully incorporates the human dimensions of ecosystem services. Through an evidence-based approach, such research can better inform policymakers based on measurable outputs, providing them with new options to reduce hunger in impoverished rural areas.

### ***Unlocking hidden genetic potential through digital information tools***

Extraordinary progress in the throughput capacity of DNA sequencing technologies and drastic reductions in the cost of sequencing, together with the creation of new bioinformatics tools to manage huge amounts of DNA data, have opened the way for rapid advances in the study and conservation of plant genetic resources linked to crop improvement.

In a new effort to build on those developments, CIAT proposes to create a new genebank that will take advantage of the latest gene sequencing technologies to assess genetic diversity more fully, while also managing germplasm (as seed and in vitro plantlets) more efficiently. The new facility will be able to distribute both physical seeds from the CIAT collections as well as the related digital genetic information that is vital for unlocking their hidden genetic potential.

At the same time, CIAT's plant breeding teams will integrate the use of digital genetic information into novel strategies that accelerate genetic gains for key traits, with the aim of creating a new generation of higher yielding, climate-smart crops. As our scientists identify novel genes and determine their functions, they will provide our partners with adapted germplasm along with digital genetic information in the form of allelic DNA sequences.

**Question 2 – What do you think about these proposed strategic initiatives? Please feel free to suggest further topics and explain why CIAT should address them?**