

“Clever plant science is not enough on its own”

The promise of sustainable intensification in the tropics

Dr. Ruben Echeverria is Director General of the International Center for Tropical Agriculture. The Syngenta Foundation asked him how CIAT works, where it’s heading, and what other changes he foresees.

SFSA: How would you describe CIAT’s present position and focus?

Ruben Echeverria*: CIAT is known for its ‘systems’ approach. We combine genetic improvement of selected crops with research on agronomy, soils and ecosystems, as well as climate adaptation and policy analysis across many farming systems.

How does your Center conduct its crop research?

We focus on boosting the problem-solving power of science via advanced techniques. For example, we draw on genomics and gene discovery to speed the development of stress-tolerant crops. We use ‘Big Data’ approaches to support major initiatives aimed at restoring degraded land and making agriculture ‘climate-smarter’. CIAT also runs a genebank with more than 65,000 samples of beans, cassava and tropical forages. This collection is a literally vital resource for improving global food security in the face of challenges like climate change. It additionally helps us strengthen the research capacities of national partners.

You have now been in charge of CIAT for over five years. What have been the main changes under your leadership?

My first priorities were to strengthen CIAT’s scientific teams and foster growth in funding. The aim was to mobilize our great scientific capacities better. I have also worked to consolidate the Center’s role in Latin America, especially in our host country Colombia. In parallel we have been reinforcing CIAT’s presence in Africa and Asia, working from our regional hubs in Kenya and Vietnam. We have recently developed a strategy for collaboration across all three regions. CIAT has done 50 years of great work worldwide. But we need to focus more on specific partnerships with developing countries, particularly those fast-growing economies that are increasing their investments in national research capacities.



“CIAT a niche operator? Focus and success certainly don’t limit us!”

You now have about another five years to go. Where do you see CIAT going during your further tenure, and after you retire?

We're working on a set of strategic initiatives that address major development challenges in innovative ways. We believe that we can help deliver major advances toward eco-efficiency, greater development impact, and new directions for research not just at CIAT but throughout the CGIAR**. For instance, if we can position our regional bioscience platform and agribusiness park in Latin America, if we continue to expand the regional bean research platform in Africa (*PABRA*, s. *below*) to include many other aspects of development (value chains, gender, climate) and if we implement our new strategy to work in Asia I will retire very happy!

Those sound like very far-reaching goals. But isn't CIAT really only a niche operator?

It's true that we have tended to specialize in certain crops. These are often ones that other organizations have rather neglected, despite their importance for food security and poverty reduction. We've made striking progress in improving such crops. If focus and success make us a "niche operator", fine. But if anybody sees that as limiting us, I would have to disagree.

Clever plant science is not enough on its own. So CIAT has also built a strong program of research on soils and landscapes, and steadily expanded its capacity in modeling and spatial analysis. We link our activities and insights here closely to decision and policy-making. Furthermore, over the last decade or so, our so-called "niche" operations have moved into the mainstream. Much of our work now lies at the heart of CGIAR efforts to tackle climate change and land degradation.

When you talk about "major development challenges", what are your top priorities?

CIAT's list is rather unusual. One of our top priorities is to help strengthen the numerous national agricultural research institutions in developing countries. Another is to get a critical mass of investment allocated to agricultural R&D. Governments need to spend much more on improving food security. How to achieve that? Working in partnerships, we have learned that there are key strategic initiatives to pursue such agendas. For instance, we are working on rethinking sustainable food systems (less food waste and less post-harvest loss), on increasing livestock productivity in an environmentally sound way, on promoting small and medium-scale seed systems, etc.

Critics sometimes question the ability of public research programs to achieve 'impact at scale'. How do you see this subject?



Generalizing historically around the world, I can understand those doubts. CIAT, however, puts great emphasis on achieving large-scale impact with its R&D findings. We pursue that goal through three channels: regional networks, private-public partnerships (PPPs) and partnerships with development agencies.

In our extensive regional networks, national partners collaborate to turn new germplasm and knowledge into useful products for farmers. PPPs build growth markets for specialized products. Think of cassava with new starch properties, or highly productive hybrids for forage grass. Our partnerships with development agencies teach us, local NGOs and others how to transform smallholder agriculture into a sustainable, market-oriented enterprise.

But what about measuring impact?

There are many layers of impact assessment. We, like many other organizations, are pretty good at the easier aspects. Yield increases with a new variety, or changes in soil quality, are relatively straightforward to measure. Where we are not so skilled yet is in measuring the resulting social impact, particularly in areas like policy that are the hardest to chart. We know we need to improve here.

“We breed new beans every three weeks”

You mention national R&D partners, often called NARS. Let’s take an example: How does CIAT use its great strengths in bean germplasm to help optimize breeding by African NARS?

Overall, about 500 new varieties have come out of 25 years’ CIAT bean R&D., That’s about one every three weeks. We reckon that farmers are planting our improved beans on about 30% of the relevant area.



Since the 1990s, CIAT has coordinated the Pan-Africa Bean Research Alliance. [PABRA](#) unites 29 national programs via sub-regional networks. It enables African countries to help each other realize the huge potential of improved beans for combating hunger, malnutrition and poverty. To cite two examples: Rwanda’s success with superior climbing beans has spread to neighboring countries, and Cameroon has released several improved varieties, even though the country doesn’t have a bean breeder of its own.

PABRA is strongly supported by the Swiss, Canadian and US governments. I am delighted that the Syngenta Foundation has recently also teamed up to develop biofortified beans for Burundi, Kenya and Rwanda. These beans are rich in iron and zinc. Further details are available [here](#).

Without such partnerships, NARS can be rather isolated. Is that also a danger for CIAT and the potato research institute CIP? You are essentially the only CGIAR representatives in Central and South America.

You’re right that the two Centers you mention have their headquarters in Latin America. But so do our corn and wheat colleagues at CIMMYT in Mexico. And many other CGIAR centers do great work in the region as well. They channel much of their effort through CGIAR Research Programs that deal with climate change, ecosystem services, market links and other key global themes. In Central America alone, six CGIAR Centers are working together to reduce rural poverty and land degradation. So I see no danger of isolation!

The CGIAR recently ran a Consultation on Sustainable Agricultural Intensification for Latin America and the Caribbean. CIAT employees contributed their views. What will the outcomes mean for your organization?

Sustainable intensification of agriculture is a desirable goal for Latin American and the Caribbean as a whole. However, there is no “one-size-fits-all” for this very diverse region.

Some sectors and areas – like Colombia’s vast Eastern Plains and irrigated rice – lend themselves particularly well to sustainable intensification, and we are actively pursuing this goal. But elsewhere,

we're developing other entry points for change. In Africa, we are not always sure which are the best. But overall, they center on sustainable food systems, ecosystems and site-specific agriculture based on Big Data approaches.

“There’s no ‘one-size-fits-all’ in sustainable intensification”

What might be an example of an “entry point for change”?

West Africa, in particular, continues to grow more and more rice. So many farmers there will need more water. Latin America has made considerable progress in water harvesting. So there may be potential for transferring more of this expertise to Africa.

Does the LATAM Consultation mark the start of greater CGIAR interest in your region?

CGIAR is already very interested in Latin America! However, I believe that the Consultation reflects, and will stimulate, greater recognition that investments in agricultural research for Latin America generally deliver larger returns more quickly than in other parts of the developing world. The continent also has huge potential for spurring agricultural development elsewhere through “South-South” exchange of knowledge and experience. So when we talk about our region’s potential to serve as a “global breadbasket”, we’re not just dreaming – we’re charting a clear development path.

How do you see the CGIAR evolving in other ways?

CGIAR is putting the finishing touches on a new strategy that will help guide our future work. This document outlines major development challenges and points to multiple opportunities for addressing them. New global Research Programs will be identified, and I believe that these will be much more inclusive (in the sense of partnerships) and much more results-oriented than in the past. So, I see a great evolution of the CGIAR into concrete development impacts.

CIAT is almost 50 years old. Is issuing a new strategy a sign of mid-life crisis?

Definitely not! This is about science for impact. Let me give you two examples. One new thrust is the rapid development of complex systems-based approaches that better enable us to integrate the actions of different research disciplines and development partners. On this basis, we can work more effectively toward delivering food security alongside the preservation of ecosystem services. Another focus of the new strategy is the spreading of new knowledge and technologies, notably in genomics and related areas of molecular biology. This opens up exciting new prospects for increasing the speed and reach of crop improvement.

“Don’t come with standard recipes from business schools!”

What about the “customer” side? Farmer gender, for example, doesn’t seem to be a major topic for CIAT.

It certainly is. But gender issues are not something that CIAT should tackle alone. We are part of the CGIAR, and one of the organization’s major cross-cutting global issues is gender inequality in agriculture. Yield gaps are often perpetuated by gender gaps. If we expect to improve the performance of developing country agriculture, we must make unprecedented efforts to empower women and girls, so

they can benefit from new opportunities for sustainable development. CIAT is absolutely on board here, and will contribute alongside all the other CGIAR Centers.

A final question on a more personal note: You have considerable experience in managing scientists while being heavily dependent on grants. What advice would you give to younger colleagues embarking on such a task?

Don't come with standard recipes from business schools! Good scientists are hardworking, free-thinking and, in the best sense of the word, stubborn. My advice is to reduce every bit of bureaucracy you can, and cut committee time; and in a sense look for more simple – more horizontal – management structures. However, as well as ironing out unnecessary hurdles, you always need to challenge researchers. My favorite question about R&D is "so what?" If a project isn't going to serve farmers, drop it.

Ruben Echeverría** has worked on agricultural and rural development issues for more than 30 years. He studied Agriculture in his native Uruguay and Agriculture & Applied Economics in the USA. After 15 years with the Inter-American Development Bank in Washington DC, he became Executive Director of the Science Council of the *CGIAR** in 2004, based at FAO, Rome. He took up his current role as Director General of CIAT in 2009. He is based in Cali, Colombia.