Farming, Physics and Biofuels
An Interview with Brazilian Research Leader Silvio Crestana

In a recent phone conversation between the CGIAR Secretariat and Silvio Crestana, Director-President of the Brazilian Agricultural Research Corporation, or Embrapa, the discussion centered mostly on energy – and not just the kind that powers cars and economies but that which accounts for dynamism in human institutions as well.

Currently, Crestana's organization is channeling some of its human energy into preparations for a workshop entitled Transforming Tropical Agriculture: An Assessment of Major Technological, Institutional, and Policy Innovations, which will take place at Brasilia on July 17-19, 2006. The event will bring together a group of about 200 government policy makers, private sector representatives, development practitioners and researchers for a dialog on innovations that have made possible the transformation of tropical agriculture in some parts of the developing world.

Embrapa originally conceived the workshop, Crestana explained, as a means of thoroughly documenting a revolution that has transpired in Brazil's tropical agriculture over the last three to four decades. He referred specifically to the country's unique experience in developing intensive agriculture for the Cerrados, or savannas. Among other achievements, he said, "Embrapa basically invented the tropical soybean, making it possible to shift the frontier of production from Brazil's temperate south to its tropical center."

Achieving Institutional Strength

Behind this technological and economic transformation lies an important institutional achievement, which has made Embrapa one of the strongest agricultural research organizations in the developing world. It consists of 38 research centers located across the country, plus 3 service units, and has an annual budget of about a half billion US dollars.

When asked what accounts for Embrapa's continued strength, Crestana cites several factors. First, the organization maintains an open dialog with all sectors of society, both public and private, about the importance of research for building a knowledge economy that can generate jobs and income. Second, Embrapa projects an image of strength in its dialog with Brazilian society, and it amplifies this through an active program of communications.

Third and most important, Embrapa delivers relevant research results in keeping with a coherent national strategy that responds to the demands of small agricultural producers as well as large and to the needs of all Brazilians. Or to put it another way, Crestana says, "we find solutions in agriculture that help fulfill our goals and aspirations as a nation."

From the Farm to Physics and Back to the Farm

Crestana came to lead the organization from a background that is predictable in some ways but in others not. Born on a farm, he showed a strong curiosity about science, especially physics, from an early age. He studied both theoretical as well as applied physics and became particularly interested in applications to natural systems. This led him to focus on soil physics and specifically on technology for managing soil physical conditions, an area that figures importantly in Embrapa's research.

Before being invited to join Embrapa's Board of Directors and subsequently to serve as its Director President (from January 2005), Crestana played a key role in creating the organization's strong international research links. These contribute importantly to staff development and to knowledge sharing.

One key mechanism by which Embrapa works toward these ends is referred to as the Labex. This is a research laboratory established by Embrapa in other countries, where its researchers can come and go, working in close collaboration with foreign colleagues. The first such lab was established at the Agricultural Research Service (ARS) of the US Department of Agriculture (USDA), in Washington, D.C., with Crestana serving as its first coordinator. Another such lab was subsequently set up in France for collaboration with this and other European countries, and a third is planned for Asia.

Investing in Agriculture for Food, Fiber and Biofuels

The combination of experiences described above has prepared Embrapa to exploit the unique opportunity offered to tropical agriculture by growing world interest in biofuels. For this purpose, the organization has established a new research center, called Embrapa Agrienergy, which is headquartered at Brasilia and has operational units in different parts of the country.

"This investment is critical," says Crestana, "given unprecendented high petroleum prices and rising concern about the consequences of global warming."

Though Brazil currently relies exclusively on sugarcane for production of ethanol, its researchers are investigating the potential of other crops as well – including castor bean and oil palm –mainly to produce biodiesel.

"The central challenge in this area for tropical agricultural development," Crestana maintains, "is to transform ethanol and other biofuels into major export commodities, like soybean and maize, which can generate large economic benefits for the developing world." Countries that lack petroleum stand to gain renewable energy sources, while also generating employment and income.

"Even countries that have significant petroleum production need to diversify their energy sources and decrease their consumption of fossil fuels," Crestana argues. For that reason, Nigeria, has already sought assistance from Brazil in ethanol production from sugarcane.

Expanding International Collaboration

“In Nigeria and other African countries, such as Angola and Mozambique, there are many opportunities for collaboration in technology and business development,” Crestana notes. “Expanded international collaboration is vital for narrowing the technology and knowledge gap between these countries and the industrialized world.”

“About a year ago,” he adds, “we began establishing an office in Accra, Ghana, to facilitate knowledge sharing and technology transfer with African colleagues. The office will begin functioning in September of this year. Embrapa can play a key role in Africa, because we understand developing country conditions there and elsewhere.”

“This is the role we envision for ourselves in global science and economic development, he explains, “creating new knowledge flows that enable developing countries to make better use of their land and water for transforming biomass into high-quality food, fiber and energy.”

As Embrapa takes up that role, Crestana considers its partnership with the CGIAR System to be highly valuable. “That’s why we invited the CGIAR to help organize this workshop; we saw it as a logical partner for helping document in detail the gains so far but also for identifying new opportunities to transform tropical agriculture.”