I’d Rather be Foresighted than Myopic: Foresight Exercises for Agriculture, Food Security, and R&D in Latin America and the Caribbean

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“It is very difficult to make predictions, particularly about the future” Yogi Berra

Introduction

This brief is a summary of a longer document being prepared for the International Center for Tropical Agriculture (CIAT) in the context of the coming 2nd Global Conference on Agricultural Research for Development (GCARD 2). It is the result of a process that started with a workshop in Washington D.C. in March 2012 analyzing trends and scenarios, and has gone through different consultations. The longer document is part of a medium-term strategy to support decision making in agricultural technology in Latin America and the Caribbean (LAC) using foresight and other methods, aligned with CIAT’s intention to serve the region better and maximize LAC’s contribution to global food security, poverty reduction, and environmental sustainability.

Foresight Exercises

The first thing to recognize is the widespread use and popularity of the term “foresight studies” in reference to what seems a large variety of approaches and activities undertaken in support of planning and decision-making. The literature on foresight studies identifies a variety of methods, with different applications. However, scenario building, in quantitative and/or qualitative terms, is so widely used that sometimes is taken as equivalent to the notion of foresight studies. In this study we look mostly at scenario analysis and trends.

Past Trends in LAC

Prospective studies need a consideration of the past because the current situation is the starting point for future scenarios and several of the current trends and drivers may well continue in the future. Here we briefly present some aspects of the evolution of LAC agriculture and economies during the last decades. First, food availability has increased somewhat more than the world as a whole. Second, LAC agricultural and food production increased its share in global production from 10% in the 1960s to about 13%. Third, particularly during the 2000s LAC became the main agricultural and food net exporting region.

3There is an important heterogeneity in LAC agriculture, but we can only look here at the region as a whole. From a global point of view, however, LAC countries share some characteristics. The 2008 World Bank Development Report on Agriculture for example classifies most of LAC countries—with a small number of exceptions- as “urbanized economies”.

This brief series was developed in preparation for the Foresight Breakout Session of the Global Conference on Agricultural Research for Development (GCARD 2012) and the Global Foresight Hub. The briefs were written to communicate to a wider audience, such as policy makers, civil society organizations, researchers, and funders. The briefs were classified into three categories: Future Studies, Regional Update, and Visioning.
Fourth, agricultural area expanded considerably representing about 1/3 of the increase in world agricultural land between the 1960s and 2000s. Fifth, 2/3 of all the forest lost at the world level between 1990 and 2010 occurred in LAC. Although LAC has comparatively low levels of greenhouse gas (GHG) emissions, land-use changes and deforestation represent the largest percentage of GHG emissions in the region: 46%, compared to 17% for the world, and 30% for developing countries.

Important changes took also place in the agricultural production/processing/marketing space, with seed companies providing technology for cereals and oilseeds, meat companies organizing the value chain of beef, poultry, and pork production, and supermarkets structuring the production of fruits, vegetables and specialties. At the same time, public investment in agricultural research and innovation related to agricultural GDP has been stagnant at best, with the growth rate of yields in some key crops slowing down.

LAC countries also showed other important socio-economic changes: GDP per capita (in constant US dollars) increased by 85% and life expectancy improved by 18 years since the 1960s. Literacy reached 91% of in the late 2000s. The percentage of population suffering from poverty declined from 24% in 1980 to 12% in 2008, yet LAC remains the most unequal region of the world. The percentage of urban population increased from 53% in the 1960s to 77% in the 2000s, far above the world’s averages. Democracy expanded, so that LAC is now the developing region with the largest percentage of democracies.

**Uncertain Futures**

In most prospective studies, LAC continues to be an important net agricultural and food exporter, providing the complementary margin to world production that helps stabilize prices and quantities.

Those projections have a large margin of uncertainty, especially related to growth rates. Main unknowns going forward are a) the resolution of the current crisis, which may put the world on a subsequent trend growth permanently below the previous path; and, b) after the crisis is over, what may be the new growth mechanisms that could lead to the acceleration of growth assumed in many projections to be above historical levels.

There are also uncertainties about population trends and consumption patterns. Usually economic analysis of food consumption is linked to incomes, prices, and urbanization trends. But other issues such as marketing policies and the expansion of supermarkets, health concerns, social and ethical values (e.g. cultures, organic and sustainable production, and animal welfare), and renewed concerns about waste, also influence consumption patterns. For developing countries, the issue of a declining percentage of income devoted to food (called the Engel coefficient) with increases in incomes (perhaps in a non-linear way) has to be addressed, avoiding food-demand projections with fixed coefficients as is now usually the case. The composition of age and gender of the population also matters. While most projections of food demand consider relatively stable demographic structures, the continuous aging of the world population may lead to declining requirements of calories per capita. In the case of LAC, the continuation of the strong process of urbanization has been shifting concerns about poverty and food security to the cities.

In climate change simulations, different models present divergent projections of climate outcomes even for similar levels of accumulation of greenhouse gases (GHG) and aerosols in the atmosphere. This divergence generates important changes in projections for crucial producing countries. The expanded and more sophisticated models being utilized for the Fifth Assessment of the Intergovernmental Panel on Climate Change are likely to expand, rather than narrow, the range of potential climate change outcomes.

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1. LAC has 0.3 kg of CO2-equivalent emissions per 2005 $GDP/PPP, compared to 0.7 kg for all developing countries and 0.5 kg for the world.
There have always been important links between agriculture and energy, related to production, processing, and transportation costs. More recently, those links expanded to include the issues of biofuel mandates, and climate-change impacts, associated to energy-related GHG emissions. The previous commodity price spikes in the mid-1970s led to technological innovations in energy that contributed to lower real prices in the 1980s and 1990s: the development of deep sea oil extraction that opened production in the North Sea.

In the agricultural sector, the advance of the Green Revolution was also supported by declining oil prices which lowered fertilizers price and production costs in general. One of the main uncertainties related to the link energy-agriculture, besides the level of biofuel mandates and geopolitical stability in some producing regions, relates now to the evolution of the production of shale gas and tight oil, linked to new technologies for these unconventional sources of energy.

There are also important questions marks related to global integration and governance with high disruptive potential. These include the potential impact of the current financial crisis on the European Union, global economic imbalances and the potential for currency and trade wars, the evolution of climate-change negotiations, and the future of other regional economic pacts.

These are all crucial unknowns for development, poverty alleviation and food security, with implications for strategic decision-making for agricultural technologies and innovation. They suggest several scenarios discussed in greater detail in the longer document, with direct implications for LAC agriculture and CIAT.

A dual role and an enormous challenge

What does all this entail for the decisions regarding agricultural technology in LAC, and particularly in the context of GCARD 2 and considering the agricultural technology priorities presented through FORAGRO for GCARD 1?

All the future simulations and scenarios tend to confirm that role for LAC in the next decades. LAC is likely to remain a crucial component of global food security by providing the largest margin of net world food exports, helping to stabilize world prices and quantities. Also, LAC is the main developing region in terms of generating global environmental goods, including biodiversity and oxygen, which may be affected negatively by a continuation of current trends in terms of land use changes. The genetic origin and diversity of several plant species (corn, beans, cassava, wheat, etc.) is in the LAC region. CIATs gene bank, coupled with its advanced biological sciences and crop applications experience and capacity, constitute a regional advantage of a portfolio of strategic advances in agricultural and biological science, technology and innovation (STI) for applications/extrapolations to/in other areas such as Sub-Saharan Africa and South East Asia. In summary, the LAC region will play a dual role: i) responding to national socio-economic and environmental challenges, and ii) being an eco-efficient global agri-food supplier, whose performance is crucial for global food security and environmental developments.

This dual role may suggest the need to expand the issues related to energy and agriculture to more than biofuels and biomass. Increasing energy efficiency in the whole value chain of agricultural production, processing, and transportation, is a “multiple win” approach by reducing costs and decreasing the emissions of GHG related to agricultural activities. Additionally, regional priorities as identified by FORAGRO would have to place increased emphasis on urban populations and consumer characteristics and preferences.

Given the uncertainties in future scenarios and the need to act now, it would be important to devise criteria and approaches for prioritization of “multiple win” technologies. In that regard, it seems necessary to maintain the diversity in foresight approaches and other strategic planning and methods of prioritizing technology decisions: from general quantitative and qualitative scenarios to more focused methods that can be utilized for specific problems and topics.
The challenge ahead is enormous, involving issues of food security and poverty, environmental sustainability in the face of climate change, and powerful socio-economic drivers that may tend to maintain the world and LAC on an unsustainable business-as-usual path. Reshaping those trends will require important investments in agricultural technology and innovation in LAC, with crucial implications for global food security and environmental sustainability. Now many of those changes are driven by private sector actors in LAC, which follow rational approaches based on private estimates of costs and benefits. The consideration and pricing of externalities and alternative approaches requires strengthening the public side of agricultural R&D&I, including the crucial issues of institutional innovation and expansion of human capital and capabilities. The old system will have to expand into national, regional and global systems of innovation, including reformed NARs, international organizations, universities, the private sector, consumers, and other stakeholders, which may require country investments of more than 1% of the agricultural GDP.

Along with its responsibilities to other developing regions, CIAT is supporting the strengthening of a framework and process for foresight work in LAC. This will help the Center and its partners to identify and develop appropriate agricultural technology options that generate incomes and employment for family farms and the rural poor in that region, while fostering local, national, and global food security and sustainability.

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