Systematization • Technical Forum

Implications of climate change for maize and bean production in Central America

Venue:	Inter-American Institute for Cooperation on Agriculture (IICA). San Jose, Costa Rica
Date:	September 6, 2012
Objective of the Forum:	To increase knowledge related to the interpretation of models for estimating the impact of climate change on maize and bean production in Central America, the socioeconomic implications, and the selection of adaptation options.

Key points made in the presentations

1. Impact of climate change on the bean and maize system in Central America

Researcher Peter Läderach, leader of the climate change group of the International Center for Tropical Agriculture (CIAT), provided details of the work carried out by CIAT, Catholic Relief Services (CRS) and the International Maize and Wheat Improvement Center (CIMMYT) using the IPPC's global circulation models and DSSAT crop simulation models to determine the possible impact on maize and bean production systems at the local level in Central America, with a view to identifying specific adaptation measures.

The fact that more than one million smallholders in Central America depend on maize and bean production for their subsistence underscores the importance of the research. It also means that these production systems and food security and livelihoods in the region are closely linked.

The study set out to gauge and classify the impact in three kinds of areas:

- **Adaptation points:** where measures designed to adapt production systems will be needed, since 25% of production is expected to be lost.
- **Critical points:** where more than 50% of production will be lost and the efforts should focus on the diversification of livelihoods.
- **Pressure points:** where production is expected to increase more than 25%. Agriculture could migrate to these areas, making them susceptible to deforestation due to the expansion of the agricultural frontier.

Socioeconomic variables were incorporated into the impact analysis to make it possible to assess system vulnerability. The variation in impact, depending on the local conditions, suggests that adaptation strategies need to be specific for each place and take into account the adaptability of producers in each region.

One of the study's more general conclusions is that it is important to focus on the sustainable intensification of production, the diversification of farm income, and the increase of "life capital," to guarantee viable adaptation strategies.

The speakers at the technical forum were Peter Läderach of the International Center for Tropical Agriculture (CIAT); David Williams, Manager of IICA's Agriculture, Natural Resources and Climate Change Program; Francisco Enciso, Executive Secretary of SICTA; and IICA consultant Jonathan Castro.

The forum took place at IICA Headquarters in San Jose, Costa Rica, and was webcast to a number of Latin American and Caribbean countries.

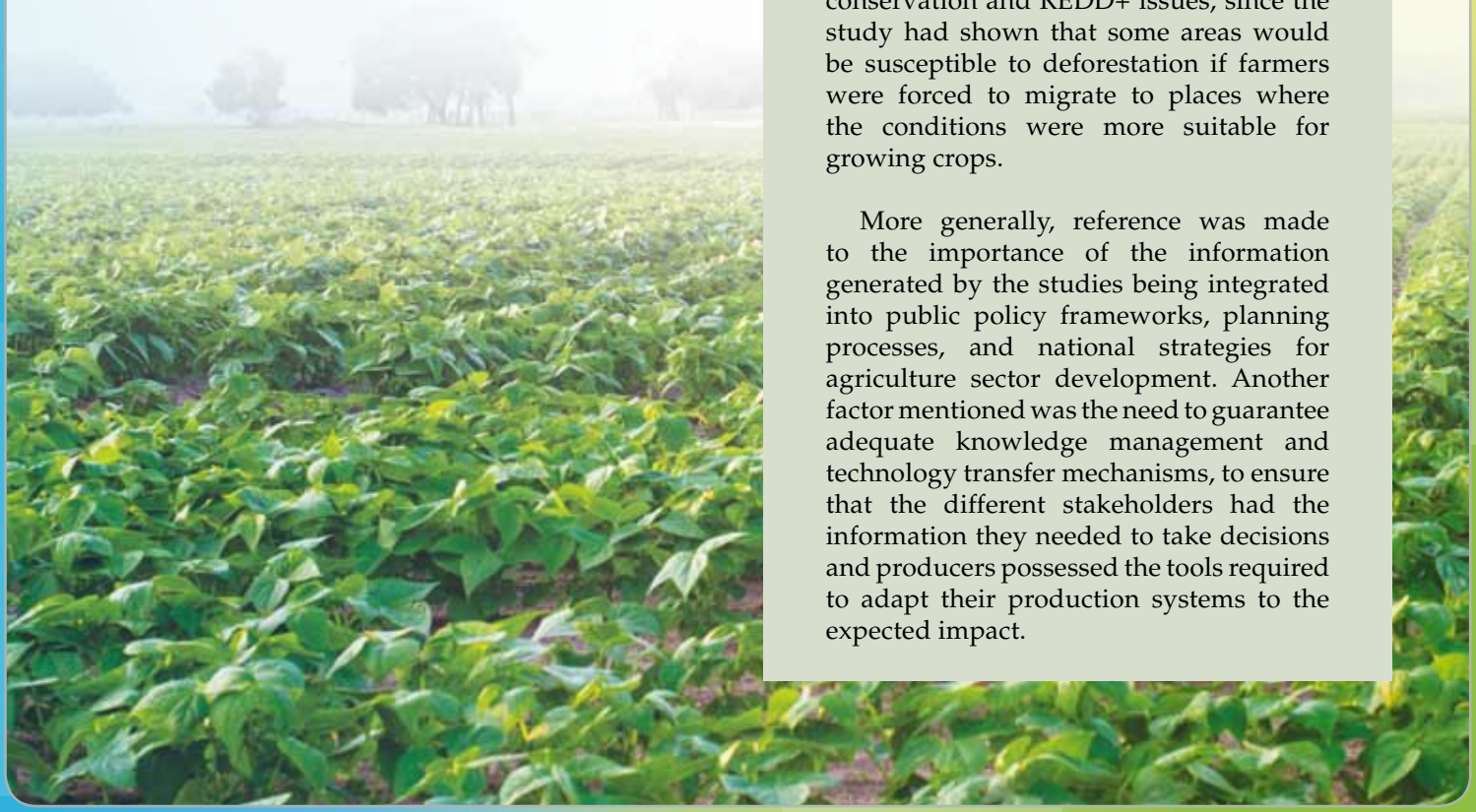
During the technical forum, Läderach explained that, in Central America, the high vulnerability of some crops to climate change could pose a threat to the food security of small farmers and their families.

2. Adaptation of maize and beans to climate change in Central America: Joint action strategy. SICTA/NAIIs-IICA

Jonathan Castro, a consultant in the area of technology and innovation with the IICA Office in Costa Rica, spoke about the progress of the regional project on the adaptation of maize and beans to climate change in Central America and the Dominican Republic. The project aims to identify, assess, develop, and distribute improved and adapted maize and bean germplasm to counteract the direct effects of climate change, and their impact on food security.

In the presentation, emphasis was placed on the work being performed with the networks of bean and maize specialists of the SICTA Network, and the task of validating genetic material that is being carried out in a participatory manner with producers, and through the evaluation of field tests.

A case in point was the pilot effort in San Martín de El Águila, Pérez Zeledón, Costa Rica, where 20 varieties of maize and 25 different bean materials were distributed for the field tests and trials.



Key points of the discussions

During the Q&A session, the question was raised with respect to the unreliability of global circulation models when they are scaled down. This means that, ideally, the regionalized models should be used. These are not yet available for the entire region, however, so it is very important that efforts be made to improve the baseline information with data available from the weather stations in the countries.

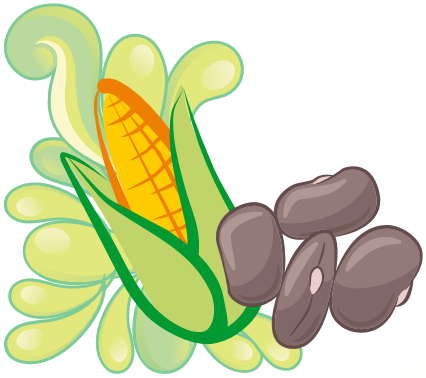
Given that the models become less reliable as their scale decreases, the information presented should be used as a decision-making tool at the regional and local levels, taking into account the socioeconomic variables that increase the vulnerability of production systems.

It was also stressed that beans would be affected more than maize, since they are more sensitive to temperature increases. Also mentioned was the need to broaden the study with information about the behavior of pests and diseases under different climatic scenarios.

The participants also discussed the importance of coordinating with experts and networks of professionals involved in conservation and REDD+ issues, since the study had shown that some areas would be susceptible to deforestation if farmers were forced to migrate to places where the conditions were more suitable for growing crops.

More generally, reference was made to the importance of the information generated by the studies being integrated into public policy frameworks, planning processes, and national strategies for agriculture sector development. Another factor mentioned was the need to guarantee adequate knowledge management and technology transfer mechanisms, to ensure that the different stakeholders had the information they needed to take decisions and producers possessed the tools required to adapt their production systems to the expected impact.

Main conclusions of the forum



- *The models for gauging the impact of climate change on crops, along with the regionalized studies of vulnerability, are useful tools for decision-making and for prioritizing the actions required to adapt production systems to climate change.*

- *The two methodological approaches presented – the development of impact models and the validation of adaptation options in the field – are complementary and should be integrated into the design of public policies and local adaptation plans.*

Sources of information:

- **Presentation by Peter Läderach**
  http://www.iica.int/esp/organizacion/LTGC/ForosTecnicos/Documents/Foro6_2012/PPT01.pdf

- **Presentation by Jonathan Castro**
  http://www.iica.int/esp/organizacion/LTGC/ForosTecnicos/Documents/Foro6_2012/PPT02.pdf

- **Red SICTA website**
  http://www.redsicta.org/

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