

Climate change and agriculture: a challenge requiring urgent action

- *There are aspects of agricultural production that contribute to changes in climate, and these changes, in turn, have an impact on agriculture.*
- *Nearly 75% of the people affected by climate change live in developing countries, primarily in rural areas, and depend on agriculture or rural employment for their livelihood.*

Introduction

Scope, concepts and relationship

For the past 10 years, the topic of climate change has increasingly become the subject of studies, research, opinions and discussions at all levels. Today, university students, legislators, business owners, government representatives in specialized fora, journalists, producers and many others are familiar to some extent with global warming, the El Niño and La Niña phenomena, greenhouse gas emissions and carbon footprint/carbon trading, all of which are aspects of climate change.

A great many people, even those with no knowledge of what climate change entails, have felt firsthand the effects of extreme or prolonged drought and severe floods, hurricanes and storms that result in the destruction of infrastructure, crops and housing and trigger other kinds of disasters.

In Article 1 of the United Nations Framework Convention on Climate

Change (UNFCCC), climate change is defined as “**a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable time periods.**”

In light of this concept, we will examine in this article the actions undertaken at the international and national levels, and their relationship with agriculture, both by those who study and observe climate change, as well as by those who are in a position to make decisions that could modify it.

We will see how the measures proposed for reducing the vulnerability of natural systems to climate changes, i.e., adaptation measures (Intergovernmental Panel on Climate Change, IPCC), compete on the political and economic level with mitigation measures, defined as initiatives or actions aimed at reducing

the elements that contribute to climate change to a certain level and by a certain deadline.

Both aspects must be considered when determining **how climate change affects agriculture both as a production system and as a way of life for rural and non-rural inhabitants associated with the system.**

There are aspects of agricultural production that contribute to changes in climate, and these changes, in turn, have an impact on agriculture, which causes a cyclical relationship. As a result, a systemic approach must be adopted in addressing the phenomenon, something that has been absent from, or perhaps not given enough priority in, the political discussions and the negotiations underway to reach agreement on the actions and commitments needed to face the challenges posed by this new reality.

Long-term effects or a process underway?

In fora where discussions focus on coordination of actions, commitments, compensation and other proposals aimed at warding off the negative effects of climate change¹, more attention seems to be paid to climate variability than to the fact that variability is a manifestation of a more profound and permanent change. We need to divest ourselves of the notion that climate change is a phenomenon with long-term effects, but rather as a **process that is under way now and causing more and more dramatic events.**

¹ Accepting the evidence to the effect that there are also positive, albeit temporary, effects that have little impact on both the production of goods and the habitat in general.

The famine in Somalia, resulting from severe drought and other factors, and the instability in food supply due to changes in its seasonal nature and geographic distribution, highlight the urgency with which the phenomenon must be addressed if the needs of **a growing population are to be met: seven billion people today and nearly nine billion in 2050**, according to estimates from the United Nations Population Fund (UNFPA, 2010).

Climate change: "a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable time periods" (UNFCCC).

Nearly 75% of the people affected by climate change live in developing countries, primarily in rural areas, and depend on agriculture or rural employment for their livelihood (FAO, 2009).

They include many of the 500 million low-income, small-scale farmers of the world and their families, who produce 80% of the food in developing countries.

It is estimated that, worldwide, **small-scale farmers account for 80% of those who work the land** (Collette et al., 2011).

The dual role of agriculture

In the cyclical relationship mentioned in the introduction and

illustrated in Figure 1, agriculture plays a dual role, i.e. one of cause and effect. It is not being suggested that agriculture alone is the sole cause of changes in climate, or that the solution to climatic phenomena depends solely on agriculture. **It is a fact that agriculture has been identified as one of the human activities contributing to a great extent to climate change, and that the sector**

emits almost one third of all greenhouse gases.

However, it is also known that environmentally sustainable and economically feasible agricultural practices can contribute to the mitigation of the impacts of climate change, and to efforts to adapt to it.

Figure 1. Agriculture – climate change cycle

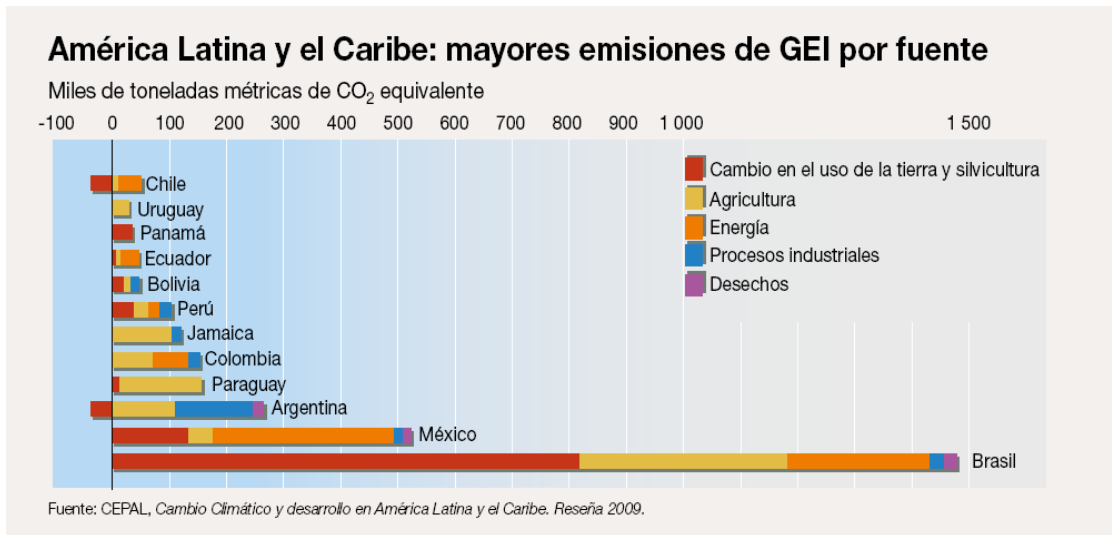


Source: Prepared by author

In countries such as Paraguay, Colombia and Jamaica, the emissions of greenhouse gases from agriculture and agroforestry are even greater than the one third of emissions mentioned earlier, as

shown in the following graph published by ECLAC in its 2009 report on climate change and development in Latin America (See Graph 1).

Graph 1



In these countries, as in the rest of Latin America, there are opportunities to implement actions both to mitigate the effects of and adapt to climate change.

Technologies aimed at primary production and processing practices that degrade the soil less and emit fewer greenhouse gases; research intended to find innovative ways to bring about necessary changes in production patterns; and changes in food cultivation practices, shifting from products whose production requires large expanses of land to products that make better use of the land and which are part of the forest environment, are alternatives that must be promoted in government policies and in international agreements and by private-sector stakeholders involved in agriculture and the rural milieu.

Tackling the challenges posed by the agriculture/climate change relationship. The current debate.

Many are the opinions and proposals that have been suggested or acted upon in this area. Some are

defended by the scientific community, others by governments.

In some cases, they do not coincide and would appear to be based more on economic considerations than on their impact on agriculture, a food production sector that involves basic elements (such as food security and production of raw materials) required for sustaining life as we know it today.

The scientists weigh in

The results of the most recent research carried out by scientists dedicated to studying and monitoring climatic phenomena suggest that, **by mid-century, changes in temperature and sea level, as well as the loss of natural resources, will make it increasingly difficult to feed the world's population** and will affect life on the planet as never before (GO-Science, 2011).

These scientists have suggested the application of measures such as conservation of ecosystems in their current state, thus avoiding further

deterioration; strengthening research and developing observation and monitoring systems that will make it possible to measure current and future vulnerability; and evaluating the impact of changes and the capacity of production systems and society in general to adapt to new conditions.

Opinions and positions of governments at the international level

Political and economic interests at the international level, and even at the national level, especially in the developed countries, follow the more conservative line supported by scientific evidence. These are the positions that define the measures and commitments adopted in fora and in agreements reached or proposed, to meet the challenges posed by climate change.

It is well known that environmentally sustainable and economically feasible agricultural practices can contribute to the mitigation of climate change and adaptation to it.

Both in the meetings of the Parties to the Agreement on Climate Change, known as the COPs, and in the partial commitments undertaken by the international community under the Kyoto Protocol, which regulates greenhouse gas emissions, we find positions that many times run counter to scientific evidence.

As a result, **the process of reacting to the manifestations of climate change, and that of adopting the measures required to meet the challenges it poses, do not advance at the same pace.**

The two most recent COPs (15 and 16) have made slow progress in finding solutions and in securing effective commitments, given the magnitude of the challenge. **At the COP16, the countries supported the creation of the “Green” Fund, to be used to finance mitigation measures in the most vulnerable countries** and to strengthen the Reducing Emissions from Deforestation and Forest Degradation mechanism (REDD+).

Nonetheless, these measures have not yet been concretized, or are still in the planning stage. In some cases, developed countries are at odds with the demands of developing countries and even more so with those of the least developed countries, which, given their situation, would like to see more concrete and flexible answers and commitments.

The international community is hopeful that at the COP17, to be held in Durban, South Africa, at the end of 2011, immediate and even longer term solutions can be found or at least proposed. **It is also hoped that the relationship between agriculture and climate change will be included on the agenda at that time, since it has not been addressed specifically in recent COPs.**

No great progress has been reported in the negotiations related to drafting the agreements for the COP17 and developing the mechanism that will replace the current Kyoto Protocol, which expires in late 2012.

Several of the countries expected to undertake the most serious commitments, due to their high levels of emissions, such as the United States, China and Japan, will be in the middle of their electoral processes or undergoing

changes in leadership, which will affect their short-term decisions.

Moreover at least one year will be needed for a replacement mechanism to the Kyoto Protocol to take effect. This means that when the Protocol expires at the end of 2012, there will be an *impasse* that might place at risk the reduction-related commitments and measures endorsed in the agreement.

National policies

While the debate rages on, many countries of Latin America already have

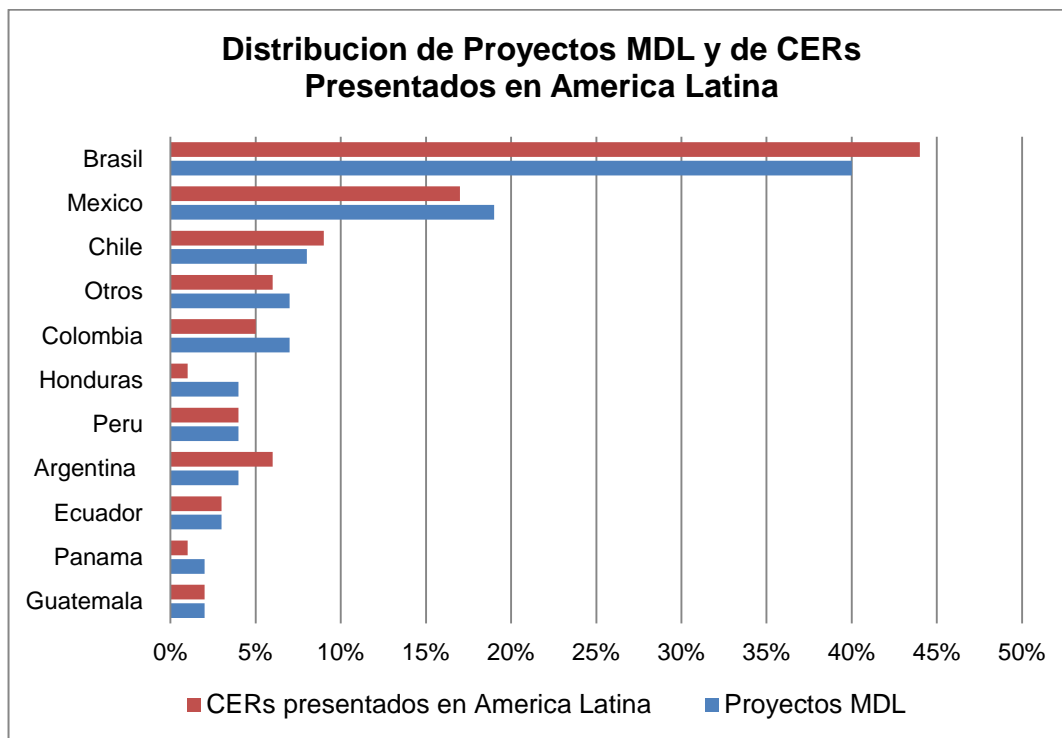
programs in place aimed both at mitigating the effects of and adapting to climate change, as shown in the following examples of initiatives proposed or implemented from 2007 to 2010, as well as projects reported by the *Clean Development Mechanism*, main source of revenue for the Adaptation Fund of the UNFCCC, established to finance adaptation projects and programs in developing countries and financed with 2% of certified emission reductions (CERs) issued by the CDM.

Forest Conservation and Management Initiatives

Countries (*)	Projects (2007 to 2010)
Mexico	2025 Strategic Forestry Program Forest Development and Pro-tree Program Forest Ecosystem Conservation and Restoration Program National Reforestation Program Commercial-scale Afforestation Program
Guatemala	Forestry Incentive Program
Costa Rica	Payment of Environmental Services Program
Ecuador, Peru and Bolivia	Regional Program for the Social Management of Andean Forest Ecosystems Regional Program on Native Forests and Agro-ecosystems of the Andes Andean Forest Seed Development Program
Argentina	2009 Experimental Forest Management and Conservation Program Program to Promote the 2008 Law on Forestry Nursery Rehabilitation and Development Project (Calingasta) and Escuela Agrotécnica (Barreal) Forestry-based Development Program (Neuquén)
Honduras	Program on the Management and Use of Coniferous Trees

Sources: Landa et al, 2010; FAO, 2007; ECLAC-UNEP, 2010

(*) Parties to the Kyoto Protocol that are particularly vulnerable to the adverse effects of climate change.



Fuente: Distribución de proyectos MDL y de CERs presentados en América Latina. A setiembre de 2010
 UNEP Riso Centre: <http://cdmpipeline.org/cdm-projects-region.htm>

Certified emission reductions (CERs). 1 CER = 1 ton CO2 equivalent reduced.

What is being proposed by a technical cooperation agency such as IICA?

In its 2010-2014 Medium-term Plan, IICA establishes the Natural Resources Management and Climate Change Program as one of its areas for cross-cutting coordination. Its cross-cutting nature is due to the facts we have outlined in this article, which indicate that **climate change cannot be addressed without linking it to all other aspects of agriculture.**

The challenges posed by the manifestations of climate change make it necessary to consider technology, health and the development of rural communities as integral parts of the answers. Since food production is affected by changing climatic conditions,

policies that holistically address this new element of the context in which we live, and which will continue to be a part of our reality, must be promoted.

IICA's Natural Resources Management and Climate Change Program promotes a **“strategic, long-term vision vis-à-vis the sustainable management of natural resources, adaptation to climate change and environmentally responsible agriculture.”**

As part of its plans to help member countries deal successfully with the challenges climate change poses for agriculture, and therefore, for the development and well-being of their inhabitants, the Program will:

- Encourage and support governments and individuals involved in formulating policies that include measures for mitigating the effects of and adapting to climate change.
- Strengthen the capabilities of public and private institutions in the area of sustainable management of agriculture.
- Work to create partnerships and coordination mechanisms between the MoAs and the authorities responsible for natural resources and environment at the national level, and pertinent organizations.
- Conduct strategic analyses as input for decision-making related to climate change.
- Promote international cooperation focused on the exchange of environmentally friendly technologies, adapted to a changing climate and aimed at facilitating their adaptation.
- Promote the management and development of research and cooperation projects related to climate change.

These and other initiatives in the countries must be the foundation of an effective response to **a phenomenon that is already a part of the agricultural production system**, and one to which the member countries of IICA must pay special attention if the development and well-being of their peoples is to become a reality.

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Acronyms

CC: Climate Change

ECLAC: Economic Commission for Latin America and the Caribbean

CERs: Certified Emission Reductions

COP: Conference of the Parties to the United Nations Framework Convention on Climate Change

UNFCCC: United Nations Framework Convention on Climate Change

FAO: United Nations Food and Agriculture Organization

IFAD: International Fund for Agricultural Development

GHG: Greenhouse Gas

IICA: Inter-American Institute for Cooperation on Agriculture (IICA)

IPCC: Intergovernmental Panel on Climate Change

MoA: Ministry of Agriculture

CDM: Clean Development Mechanism

UNEP: United Nations Environmental Programme

REDD: Reduction of Emissions from Deforestation and Forest Degradation

UNFPA: United Nations Population Fund