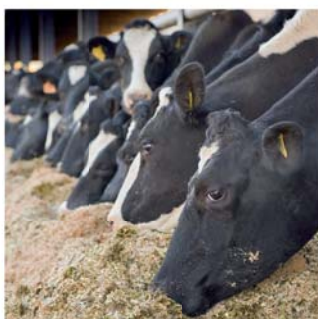
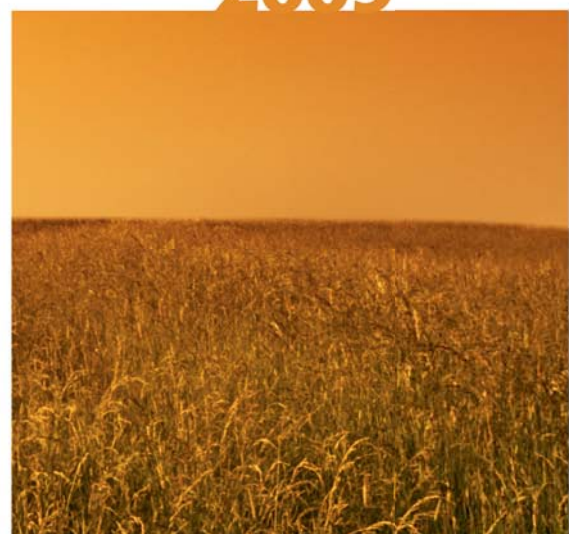


# The Outlook for Agriculture and Rural Development in the Americas:

## A Perspective on Latin America and the Caribbean

2009





**The Outlook for Agriculture  
and Rural Development in  
the Americas:**  
a Perspective on Latin America  
and the Caribbean  
**2009**

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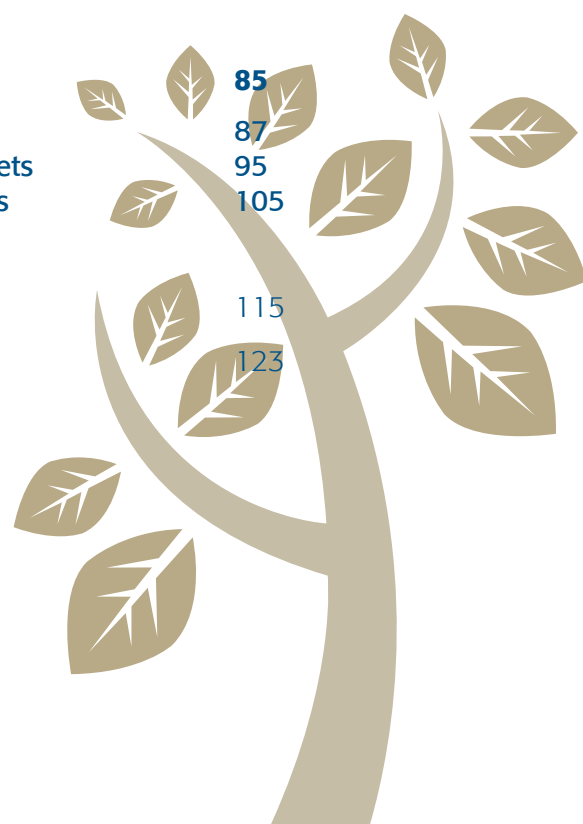
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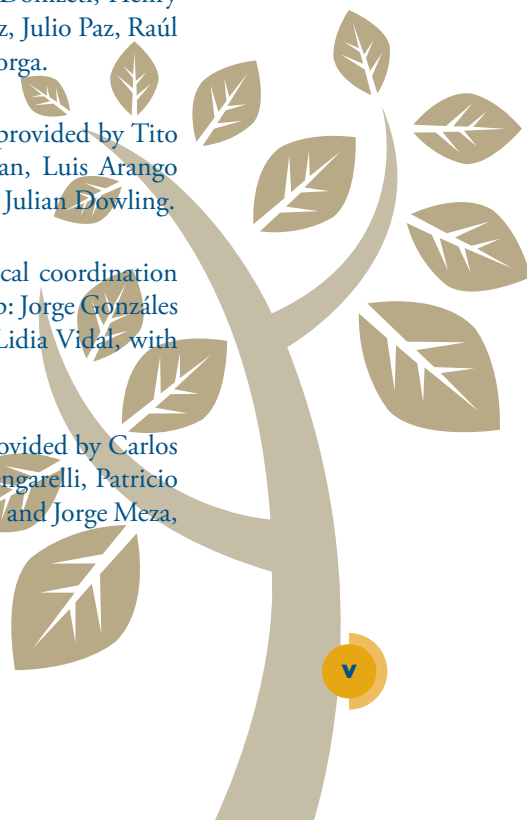


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# ACRONYMS

<b>AECID</b>	Spanish International Cooperation Agency for Development
<b>BSE</b>	Bovine Spongiform Encephalopathy
<b>ECLAC</b>	Economic Commission for Latin America and the Caribbean
<b>FAO</b>	United Nations Food and Agriculture Organization
<b>G8</b>	Group of 8 Most Industrialized Countries
<b>GDP</b>	Gross Domestic Product
<b>GTZ</b>	German Technical Cooperation
<b>GVC</b>	Global Value Chains
<b>HPAI</b>	Highly Pathogenic Avian Influenza
<b>FAO</b>	United Nations Food and Agriculture Organization
<b>IDB</b>	Inter-American Development Bank
<b>IEA</b>	International Energy Agency
<b>IFAD</b>	International Fund for Agricultural Development
<b>IFPRI</b>	International Food Policy Research Institute
<b>IICA</b>	Inter-American Institute for Cooperation on Agriculture
<b>IMF</b>	International Monetary Fund
<b>IOT</b>	Input-output table
<b>IPCC</b>	Inter-Governmental Panel on Climate Change
<b>ITTO</b>	International Tropical Timber Organization
<b>LAC</b>	Latin America and the Caribbean
<b>MDG</b>	Millennium Development Goals
<b>NARI</b>	National Agricultural Research Institute
<b>NFP</b>	National Forestry Program
<b>NGO</b>	Nongovernmental Organization
<b>OECD</b>	Organization for Economic Cooperation and Development
<b>R&amp;D</b>	Research and Development
<b>SAM</b>	Social accounting matrix
<b>WB</b>	World Bank
<b>WTO</b>	World Trade Organization
<b>UN</b>	United Nations
<b>UNCTAD</b>	United Nations Conference on Trade and Development
<b>USAID</b>	U.S. Agency for International Development
<b>USDA</b>	U.S. Department of Agriculture
<b>US\$</b>	United States dollar



# FOREWORD

In order to give decision makers in this Hemisphere a consensual reference document, the Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Food and Agriculture Organization (FAO), and the Inter-American Institute for Cooperation on Agriculture (IICA) decided to join forces to prepare this report on trends in the agricultural sector and rural areas. It is based on a common data base and a series of indicators available to all interested parties at [www.agriruralc.org](http://www.agriruralc.org).

These three institutions intend to make this document the first of a regular series of publications, which will be the result of their continued combined efforts to collaborate and coordinate their work. In this way, they hope to respond to the wishes repeatedly voiced by member governments of the three organizations to avoid duplications and inefficiencies and improve inter-agency cooperation.

The current global economic crisis has led to volatility in commodity prices and a decline in remittances from abroad, foreign investment, tourism and exports in Latin America and the Caribbean (LAC), aggravating food security problems and heightening concerns over the possibility of meeting the Millennium Development Goals of reducing extreme poverty and malnutrition. In this context, the governments of the region have formulated some effective policies. However, this report is of the view that the current development model needs to be rethought and the role and importance of agriculture and rural areas need to be re-examined.

From the analysis performed, we have learned that the Americas, and especially the Southern Cone, United States, and Canada, have major natural comparative advantages due to the fact that their land, fresh water and climate are well-suited to agricultural production, especially the production of basic foods. In a world with a growing population and changing consumer habits, with projections for continued growth in the demand for food and other nonfood products derived from the fisheries, agriculture and forestry sectors, and in view of the increasing scarcity of natural resources, the region has advantages.

But the Americas also have a responsibility to use these resources as efficiently and sustainably as possible, which will require continuous research and adaptation, especially in view of the vicissitudes of climate change. Its effects (and costs) are already being seen, especially the increased frequency and intensity of extreme climatic events such as droughts, floods, and storms.

As for Latin America and the Caribbean (LAC) as a whole, ***it is the region that has shown the greatest growth in agricultural, livestock, forestry, and fishery production, and in its exports***, over the past 15 years. However, this is due in large part to the Southern



Cone, since the other subregions are basically net importers, especially in the foods that make up the bulk of their diet, such as grains, oilseeds, meat, and dairy products.

It is also important to emphasize that primary agriculture and activities directly linked to this sector, such as agroindustry, transportation, and their inputs and services—i.e., the “expanded” agricultural sector—continues to be one of the most important sectors of the regional economy, in terms of both employment and its share of GDP and exports. Unfortunately, alongside its importance in terms of production and trade are relatively discouraging indicators regarding income, poverty, and unmet basic needs, especially in rural areas.

Yet it has been demonstrated that one dollar invested in agriculture earns more than one invested in nonfarm sectors. Thus, the main message permeating this document is *the need to make more and better investments in the sector*, not only for the good of agriculture and rural dwellers, but also for the good of all, precisely because of the beneficial spill-over effect of the sector on food security and its ability to activate the rest of the economy and reduce poverty.

Together with the main message, special emphasis is also placed on small- and medium-sized agriculture, used here as the equivalent of family farming, subsistence farming, and individual farming, or in other words, small-scale agriculture. This agriculture is constrained by a shortage of quality assets and a lack of access to infrastructure and public and private services to support it. Contrary to wishes, this sector has received relatively little support in comparison with its contributions to the supply of basic foods, employment, environmental sustainability (or “unsustainability”) and culture. In order to develop small- and medium-scale agriculture, it is necessary to integrate it into agroforestry and fish production systems and to consider nonagricultural activities and their environmental impact. Proper attention should also be paid to establishing an adequate balance between product diversification on the farm, for the purpose of reducing risks and vulnerability, and to increasing biodiversity vs. specialization and the possibility of greater yields. It is also necessary to call attention to the obstacles that must be overcome in achieving minimum production levels for a profitable operation, and to promote the creation of production chains geared to the local, national, and international markets and the formation of clusters based on specific products, with an increase in the corresponding transaction and transportation costs.

A second message, also linked to investment, is the importance of supporting youth. It is necessary to draw them back to rural life by creating the necessary conditions for them to apply the knowledge they have acquired in school system and use their creativity and ingenuity in new undertakings or in pursuing family enterprises, or as employees in various types of farm or nonfarm enterprises. All of this requires policies and institutions, including those focused on regulation, which go beyond the agricultural sector, and are intended to cover a territory of a size that would allow for close intersectoral and interdisciplinary coordination. This means that the institutional framework, in terms of both agricultural and rural development, will have to be rethought, adopting an integrated approach. It will also require short-term policies to respond to the current crisis, as well as policies for responding to challenges expected in the medium and long terms.

Agriculture and the rural sector are key to efforts to deal with climate change and food security, two of the major challenges facing mankind today. Consequently, it is essential to lay the groundwork for the agriculture of the future so that it will be able to meet these challenges.

The agriculture of tomorrow will require greater investments in: a) research on and development of varieties better adapted to expected changes in climate, irrigation technologies that make more efficient use of water, and environmentally more sustainable production systems; b) restoration of agrobiodiversity, local production systems and traditional knowledge, and food products to help diversify diets; c) promotion of healthier food habits and development of production systems and products with a reduced environmental impact (e.g., in terms of water and energy requirements and generation of greenhouse gases); and d) financial and non-financial mechanisms for the management of risks related to markets and climate change.

In LAC, a region with a great potential to contribute to global food security in the future, the long-term vision is fundamental. Consequently, emphasis is placed on the need for more and better investments in research on and development of production systems with lower energy requirements, greater use of renewable energy sources, reduced greenhouse gas effects, and in general, in research on and development of technologies and innovative production and management techniques that will lead to significantly higher crop yields.

Realization of these goals will require the participation of all members of the agricultural community in the Americas: renewed efforts on the part of all businesses, from microenterprises to small and large agricultural or related enterprises; a new impetus on the part of the governments of countries in the region, using strategies formulated by consensus; cooperation between the public and private sectors, and more international cooperation.

We, the undersigned, encourage other institutions to take part in this joint effort, to which we have pledged to contribute as international cooperation organizations.



*Alicia Bárcena*  
Executive Secretary, ECLAC



*José Graziano da Silva*  
Regional Representative, FAO



*Chelston W.D. Brathwaite*  
Director General, IICA



## Executive summary

The economic crisis, together with recent economic events, has produced an unprecedented international scenario of highly volatile food prices. At the same time, Latin America and the Caribbean (LAC) have lost the gains in reducing poverty and hunger they had achieved in the past 15 years. The region is facing both short-term challenges, linked to the economic slowdown and its impact on well-being and the soundness of government budgets, and long-term ones, involving the need to ensure economic development, and use the region's potential as a provider (and self-supplier) of food, while making sure to preserve its natural resources. All of this is taking place in a more insecure international environment due to the volatility of markets and the probable effects of climate change.

ECLAC, FAO, and IICA believe in the leading role to be played by the rural environment and agriculture, understood in its broadest sense, in dealing with these challenges, and they are of the view that an integrated, intersectoral, long-term approach is needed, as proposed in this document, along with more and better investment to trigger inclusive economic recovery.

This book is divided into three sections. The first one covers structural factors underlying the evolution, recent trends, and outlook of the agricultural sector and its four main subsectors: agriculture, livestock, forestry, and fishing and aquaculture, with an emphasis on policy recommendations. The second section takes the same approach to addressing rural well-being and agricultural and rural institutions. The third section is devoted to the current economic situation—namely, price volatility, and its causes and future uncertainties—which is particularly relevant for decision-makers in the sector.

## Section I– Sectoral Analysis

**Sectoral context** – Not to diminish its economic importance, but the sector's relevance goes beyond its contributions to GDP, since agriculture is an important source of foreign exchange and, above all, a generator of employment and income. The sector has demonstrated its dynamic nature in the past, but due to its heterogeneous geography, climate, and production, important differences are apparent among countries and groups of countries. Moreover, in the short run, both the economic crisis and the increased volatility and lack of investment (for instance, in research and transfers of technology) limit opportunities for growth in production. This means that LAC has an enormous potential to contribute to food security in the world because of its food supply, but this does not per se guarantee a reduction in domestic poverty, especially during a period of economic contraction. Agriculture is also facing challenges, such as the need to become a supplier of energy in a scenario of unstable production due to climate change. The sector must maximize its efficiency and use of resources, by taking a new approach, based on sectoral integration.

**Agriculture** – Intraregional differences were seen in 2007 and 2008, with gains in the agricultural terms of trade in some countries, and losses in others. Despite the expected increase in demand for agricultural products, the increase in international agricultural commodity prices was not necessarily reflected in prices paid to the producers, who at the same time saw their production costs rise. In order for LAC to realize its potential in production of food and biofuels, it should adopt not just sectoral policies, but integral ones, that provide public goods (research, technology transfers, public services, etc.)

and support services to increase the competitive advantage of commercial agriculture and foster inclusion and the contribution of small- and medium-scale agriculture, which plays a key role in agricultural production and sectoral employment in LAC. Moreover, the region should look for ways to adapt to and mitigate climate change, invest in productive infrastructure, and effectively guide small-scale agriculture, with differentiated policy instruments in keeping with the quantity and quality of the assets involved.

**Livestock** – Livestock production will benefit from the growth in domestic and global demand for animal products. In addition, small-scale production provides jobs and food security to millions of persons in the region. However, specific investments and policies are required for it to strengthen its productive and social role. The important position of the sector as a global exporter was achieved to a great extent at the cost of serious environmental consequences, but production will be unsustainable in the long run if productivity cannot be increased and the environmental impact reduced. A sustainable increase in productivity is possible, because the required technologies exist. Producers need policies that give priority to the sustainable use of resources, and to better animal health, to improve production and reduce the impact of zoonoses. To accomplish this, investment in research, development, and technology transfers is needed, and in lines of credit so that commercial breeders, including small operators, can recover degraded areas, form sustainable agri-forest-livestock systems, and improve productivity, while reducing pressures on the environment. Systems of payment for environmental services could help mobilize resources, so that producers could incorporate technologies to improve efficiency in use of resources and respond, in the medium and long run, to a growing demand for products capable of reducing the carbon footprint.

**Fishing and Aquaculture** – Due to their comparative advantages, their economic importance in the region is expected to grow rapidly. Small-scale aquaculture and fishing make

a substantial contribution to employment and food security in rural areas in various countries of LAC. The vulnerability and risks facing fisheries and aquaculture have become apparent in recent years, which will require them to manage the natural resources on which these activities rely in a responsible and sustainable manner. A strengthened capacity to adopt sustainable production technologies and integration with other productive sectors are critical to achieving lasting development. Moreover, strengthening vaccination and traceability systems will enable small producers to be competitive by incorporating them into value and market chains. These factors, together with the development of organizations and clusters, will offer the sector better development opportunities and the chance to achieve self-sufficiency in production, economic sustainability, and a better quality of life for the businesses and workers.

**Forestry** – The sector suffers from a lack of up-to-date, reliable information. Despite this, it occupies an important economic place in Latin America and the Caribbean, and especially in the Southern Cone where, due to the scale of the countries, it is a key factor in forestry production and exports and has good prospects for expansion in the coming years. Public policies should be strengthened to take advantage of the great potential of the sector to generate positive environmental, economic, and social spill-over effects. This potential is best expressed when emphasis is placed on the synergies of the forestry sector with other production activities and services. Forests are also a strategic natural resource, capable of providing irreplaceable services, such as a source of biodiversity, carbon capture, and protection of water and land. The use of mechanisms capable of identifying and paying for these externalities should be a priority of the governments in the region. Development of the sector can be achieved only when the stakeholders who work and live from the forests are involved in designing policies for their management, and the property and use rights of persons or communities are recognized, as long as such use is sustainable.

## Section II – Rural Well-being and Institutional Framework

**Rural well-being** – Agriculture together with rural areas are a driving force for economic development, and governments should focus more attention on them in their efforts to revitalize their economies. At the same time, donors should fulfill recent financial commitments to international agricultural cooperation. Rising food prices could present an opportunity for small-scale family farmers to contribute to rural development, but only if governments provide effective support, through short-, medium-, and long-term policy packages. The governments of the region should invest in integrated policies for social protection, food security, rural development, and environmental protection that offer the rural population opportunities to produce more food and obtain more income in a sustainable manner, while at the same time reduce negative environmental effects and social risks. Moreover, a greater effort is required in development and transfer of technologies that take into account the new challenges of climate change, among other things, and in creation of public goods in rural areas, and improving access to productive assets. These policies may not produce benefits overnight, but in the long run, they are needed to protect the most vulnerable members of society from price volatility, to improve food security, and to reduce the migration of youth and the flight of skills from rural areas to the cities. By giving rural youth hope in the future and breaking the poverty cycle, governments will be doing a favor for future generations.

**Institutional arrangements** – The process of change in institutions for agriculture and rural development has been analyzed and planned in some countries of the region. Institutional modernization is critical, and governments should assign it priority and resources. The new paradigm of rural development is oriented towards territorial integration that goes beyond a sectoral approach. There are also adjustments in the legal framework and in organizations and new forms of work that

favor consensus-building, decentralization, and participation of new civil society actors. The new legal frameworks and institutional arrangements also address the problem of food security, and in some cases, small and medium-scale agriculture with scarce resources. An analysis of key agrifood market chain structures in the region show a growing concentration in links where there is greater integration of value and knowledge, and of matters related to logistics and distribution. However, because of the limited availability of public assets, operators are dispersed, and they are usually small producers and consumers, with relatively little organizing and negotiating skills. In this situation, the use of practices that limit competition is increasingly frequent in the agrifood sector. It is important to focus attention on an increasingly widespread phenomenon of appropriation of land by states and multinationals, adding a potential factor for conflict.

## Section III – Volatility of agricultural prices

**Volatility** – The volatility of prices of most food raw materials has intensified, especially in 2008, as the result of new factors that are expected to continue influencing the global market in the medium- and even the long-term. Countries that have specialized in a limited number of agricultural exports are particularly exposed to the effects of volatility. In addition, heightened uncertainty poses the risk of discouraging production and investment in the agricultural sector, weakening the local food supply, and exacerbating the challenge of food security for the poorest families. Given this scenario, the state plays a key role in controlling volatility and in mitigating its most serious effects on vulnerable groups.

**Price transmission** – The real effects of the volatility of international prices on local markets and the income level of farmers are not really known and have been little studied. Two studies

endeavor to interpret these phenomena and offer the possibility of making a few comments. Price transmission is seen on some markets more than on others, depending primarily on protectionist policies and on the defects of wholesale markets. Although transmission of international prices to domestic markets in the long run allows for a better allocation of resources, in the short run it can affect and significantly complicate decision-making by producers. Finally, based on available data, some producers have benefited from higher prices of products sold, even with increased production costs. Therefore, in some areas, and under certain conditions, the more efficient farmers have improved their net income.

**Policy options** – Agricultural production requires long-term investments, but the market so far has not offered income protection mechanisms

that go beyond one or two agricultural cycles. Thus government participation would appear to be needed to guarantee the income of sensitive groups (producers and consumers), in accordance with its own policy objectives. The short-term objectives and long-term effects should be adequately weighed by governments in adopting policies, so that the tools applied lead to effective progress in reducing the vulnerability of the affected segments, and measures that could ultimately prove to be counterproductive by promoting greater protectionism or increased market distortions are avoided. At the same time, government action should take into account the complexity of the socioeconomic effects triggered by price volatility. To deal with this complex situation, government policies should generate synergies and ensure coordination, to maximize the positive effects of public and private investments.





# Macroeconomic context

## From the crisis in prices to volatility and a global crisis



### Box 1. Probable scenario:

- The world economy will experience a 2-year slowdown before returning to moderate growth rates beginning in the second half of 2010 (IMF, 2009b).
- In Latin America and the Caribbean (LAC), GDP is predicted to decline between 1.5% (IMF) and 1.9% (ECLAC), with a 9% increase in unemployment, an expansion of the informal sector, and a negative impact on poverty. Recovery is expected to begin in the second half of 2009, and gain strength in 2010, with a growth rate ranging between 2.3% (IMF) and 3.1% (ECLAC) (IMF, 2009d; ECLAC, 2009b).
- The speed of recovery in LAC will depend on the government's capacity to implement counter-cyclical policies within a tight macroeconomic space (ECLAC, 2009b).
- A response to the greater-than-expected supply of agricultural products, especially in developed countries, resulted in lower prices in 2007-2008. Widespread economic weakness will cause prices to remain at that level for the next 2 to 3 years. However, real prices of agricultural crops in the next decade are projected to average 10-20% more than during the 1997-2006 period (OECD-FAO, 2009).
- The reduction in prices of farm products, and in production and consumption, associated with the drop in income, is expected to have a moderate effect on agriculture, provided recovery occurs within 2-3 years; this shows the resistance of agriculture to crises. (OECD-FAO, 2009).

### • From economic growth to the global crisis

According to the IMF—in its July 2009 Report on the World Economic Outlook—by mid 2009 the global economy was beginning to show signs of recovery from the greatest decline recorded in the past 50 years. However, forecasts continue to point to a contraction of economic activity in most regions of the world in 2009, and a modest recovery in 2010, on the assumption that efforts to ensure a sound financial sector will be stepped up, at the same time as support for demand and nonrestrictive fiscal and monetary policies are continued (IMF, 2009b and 2009d).

The widespread drop in economic activity was evident at the end of 2008, after strong economic growth from 2004 to 2007. Similar behavior affected trade, as the global growth rate in terms of volume in 2008 was less than half of what it was in previous years (Graph 1).

In 2009, growth rates are expected to be significantly less than in 2008, and prior to April, forecasts were increasingly pessimistic, both for production and for trade.<sup>1</sup> However, this tendency stopped towards the middle of the year for 2009 projections, especially in the case of production,<sup>2</sup> and was reversed for 2010. In July 2009, 2010 forecasts were for growth rates higher than those projected in April in all regions, for both production and trade (Graph 1).

In LAC, signs of an economic slowdown also began to be felt in the last quarter of 2008, as a

1 After March 2008 predictions of a 3.8% growth in the global product (and 5.8% in the trade volume) in 2009, in April 2009 a 1.3% decline was forecast (along with an 11% reduction in the trade volume), with declines in all regions, except for the average of emerging and developing economies, due to the weight of China and India.

2 In July 2009, GDP growth rates projected for 2009 were relatively similar to those estimated in March 2009. However, they continued to be progressively more negative for Latin America and the Euro Zone. As for trade, July 2009 forecasts show a continued downward trend, with large reductions in comparison with March estimates.

result of the substantial reduction in domestic demand in developed economies and the fall in international prices of basic commodities exported by the region (ECLAC, 2008b). At the end of 2008, ECLAC was estimating a 1.9% growth rate for GDP in 2009, based on a scenario of slow, gradual recovery of the world economy starting in

the second half of the year. More recent forecasts show a 1.9% drop in 2009 and a 3.1% increase in 2010, a situation that contrasts significantly with growth rates in the past 5 years (ECLAC, 2009b). For its part, the IMF projects a decline in regional GDP of 2.6% in 2009 and a 2.3% increase in 2010 (IMF, 2009d).

**Figure 1.** Rates of growth in GDP and trade in 2006-2008, and 2009-2010 forecasts



**Sources:** IMF: World Economic Outlook, October 2007 (2005 data), World Economic Outlook, March 2008 (2006 data), World Economic Outlook Update Nov. 6, 2008 (Projections for 2009); World Economic Outlook Update Jan. 28, 2009 (projections for 2009 and 2010); World Economic Outlook April 2009 (projections for 2009 and 2010). World Economic Outlook Update July 2009 (2007 and 2008 data and projections for 2009 and 2010).

The strong reliance of Latin American and Caribbean economies on demand from United States markets, income from remittances, and exports of oil and other basic products affects the depth and duration of the economic slowdown and the possibility for recovery of the countries of the region. In fact, four importance factors will be determining the growth of LAC in the coming years: a) recovery of demand in the developed economies (principal markets for the region's products); b) the revitalization of emerging economies, where there is a high potential for expansion of imports; c) recovery of the global credit market; and d) the evolution of international prices of agricultural commodities.

The length and depth of the economic slowdown will also depend on the domestic production structure and the efficiency of national policies. At the end of 2008, when the outlook for the magnitude of the recession was still relatively optimistic, various sources agreed in giving a positive assessment to the region's capacity to cope with the current crisis in comparison with previous ones, essentially because various countries had been reducing their fiscal deficit, international reserve levels were high, and trade was more diversified. This view held sway until mid 2009 (IMF, 2009d; ECLAC, 2009b), when the depth of the crisis was greater than what was estimated only a few months earlier.<sup>3</sup>

Even considering the fact that the dimensions of the current financial crisis and economic slowdown cannot be compared with any of the crises experienced in the past 50 years, it is clear that this time LAC has taken on a more pro-active role in its own recovery. The economies of the region, which have demonstrated a capacity to generate and implement efficient recovery policies, could even come out of it stronger, with a potential to invest, once the developed economies and the global credit market begin to recover.

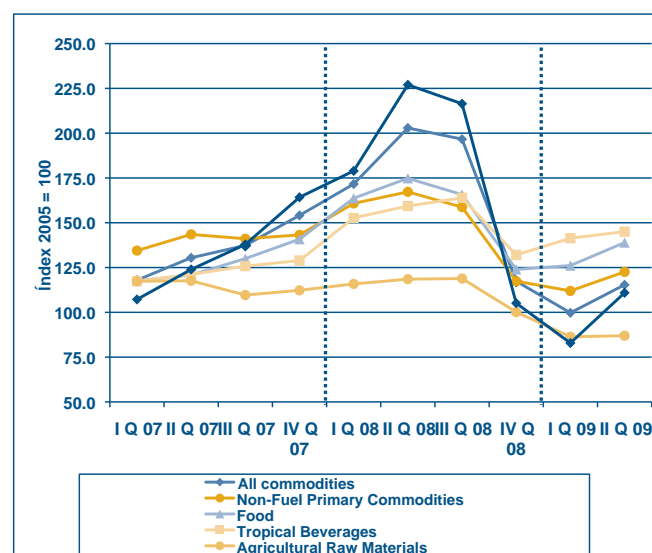
## • Price volatility and uncertainty

The prices of agricultural raw materials, fuel, and fertilizers have increased significantly since 2005, with an important surge beginning in 2007. Between 2005 and 2008, UNCTAD and IMF food price indices rose at average annual rates of 22.4% and 16.2%, respectively. These increases contrast with growth rates from 1980 to 2008, which were less than 1%.<sup>4</sup> Moreover, in both cases 2005-2008 rates were double those of 2000-2008.

The magnitude of the drop in the second half of the year, in comparison with the growth in the first half, made 2008 (together with 1973) the year with the greatest volatility in commodity prices since 1960.

Figure 2 (with the IMF indices for raw material prices) illustrates the drop that occurred in the

**Figure 2.** Prices of raw materials (Quarterly averages, 2007-2009, 2005=100)



Source: IMF (Raw material price data base). 2009

<sup>3</sup> For instance, the IMF subtitled its report on the outlook for LAC indicating that: "The most solid policies pay dividends." (IMF, 2009b).

<sup>4</sup> According to the UNCTAD index, 0.9%, and 0.8% for the IMF index.

second half of 2008 and the recovery during 2009, especially in the second quarter (the subject of price volatility is discussed in greater depth in the special section of the report).

Despite the price drop in the last months of 2008, a return to the low prices of recent decades is not forecast. On the contrary, the upward trend in the first half of 2009 is evidence that as the world economy shows signs of recovery, the forces that took international prices of raw materials to historic highs prior to the September 2008 crash (e.g., increased demand in emerging economies) are coming back into play. In addition, it remains to be seen to what extent the increase observed in recent years, including the recovery of the past few months, is indicative of a new supply and demand adjustment cycle, similar to the ones that occurred at the end of the 19th and the beginning of the 20th centuries, and between 1945 and 1970. In this context, OECD-FAO (2008) predict that real prices of agricultural crops during the next decade will average 10-20% more than in 1997-2006, since agricultural supply will barely grow enough to meet demand in the next ten years.

- **Regional heterogeneity and differentiated effects of price increases and the economic crisis**

In many LAC countries, the positive evolution of the prices of some of the main items in their export baskets has meant a substantial improvement in their terms of trade, which has enabled them to finance economic growth in recent years (ECLAC, 2008a). This was the case in the South American countries, which are major exporters of agricultural products, primarily grains and oilseeds, as well as in oil exporting countries. In these countries, the drop in commodity prices during the second half of 2008 led to a slowdown in one of the principal engines of growth in recent years. In contrast, in Central American and Caribbean countries, net importers of basic foods and oil, there was a

reversal in the deterioration in their terms of trade experienced in the past two years.

The improvement in their terms of trade—in some cases combined with a restrictive monetary policy—resulted in the revaluation of many national currencies. On average, the real effective exchange rate of LAC appreciated by 4.2% in 2007, with an average real effective appreciation of 5.1% in the South American countries versus 0.7% in Central America, Mexico and the Caribbean (ECLAC, 2008a). The trend changed in the second half of 2008, with the international financial crisis and the drop in the price of commodities. For instance, between August and December 2008, the Brazilian real depreciated 48.8%, the Mexican peso 32.8%, the Chilean peso 25.6%, and the Colombian peso 21.7% (ECLAC, 2009b, p. 32).

A decline in the terms of trade is expected in 2009, and is estimated at around 11% for the region as a whole. In Chile and Peru, metal exporters, the drop will be around 21%, whereas in fuel exporting countries, the reduction will be close to 28%. And, in MERCOSUR countries, where farm products represent a significant proportion of exports, the estimated decline is around 6%. In contrast, in Central America and the Caribbean, net commodity importers, the reduction in oil and grain prices will provide relief that will partially offset the drop in remittances and the effects of the decline in world growth. For example, in Central America a 4% improvement in the terms of trade is expected (versus a 4% drop in 2008), and in the English-speaking Caribbean, excluding Trinidad and Tobago, since it is an oil exporter, the improvement will be 11% (versus a 10% decrease in 2008) (ECLAC, 2009b).

Due to shrinking demand associated with a decline in economic activity in developed countries, a drop in the volume of exports is also expected. In fact, the contraction began in the fourth quarter of 2008 and deepened in the first quarter of 2009

in terms of both value and volume. For the region on average, the value of exports fell at inter-annual rates of around 10% to 30%, in each of those periods<sup>5</sup>(ECLAC, 2009b).

In the case of agricultural exports, the final effect of the recession will depend on their relative distribution by destination markets, since the emerging economies are expected to experience less of a decline in economic activity (see Figure 1). This is why the negative impact will be greater in Mexico and Central America than in South America, where commodity exports have a greater weight and go primarily to emerging economies, which are expected to continue growing at high rates (ECLAC, 2008b).

Increases in prices observed in 2007 and 2008 also had a considerable impact on inflation, since most of the countries are net importers of foods derived from the products that had the highest price increases (e.g., grains), in addition to oil, vis-à-vis price increases of agricultural exports (e.g., tropical products). Measured as a weighted average, the inflation rate increased from 5% in 2006 to 6.4% in 2007 and 8.4% in 2008. The upward trend was highly influenced by an increase in the prices of food and energy products. It is precisely for that reason that the rate of increase in prices declined significantly as of September 2008. In May 2009, annual inflation was reduced to 6.1%, with more significant declines in the Central American countries (ECLAC, 2009b).

Since agriculture is an important activity in many countries of the region and is more labor-intensive than the energy sector, an abrupt drop in international commodity prices also has a negative impact on regional economic activity, through employment and the income of producers and employees in the agricultural sector.

The current context of the economic crisis also has differentiated effects from one country to the next. ECLAC identified three major channels of these effects: a) the impact stemming from the drop in

demand in developed countries, which affects the exports of countries that are major exporters to those markets; this is the case with Mexican and Central American exports to the United States; b) the drop in remittances sent by Latin American migrants to their countries of origin, a phenomenon that primarily affects Central American and Andean countries; and c) the drop in tourism, which has the greatest impact on the countries that are important tourist destinations in the Caribbean basin. In the case of remittances, they attained a historic high in 2008, yet the amount was very similar to the 2007 figure (IADB, 2009) (See country data in the statistical annex.) For 2009, a decline of 5% to 10% is expected (ECLAC, 2009).

The differentiated impact in the behavior of commodity prices, and the drop in remittances and tourism, are repeated at the level of households, since both agricultural production and remittances are more important sources of income in poorer households. Moreover, food costs have a greater weight in these households, which indicates that the main impact of price volatility and the drop in remittances is concentrated in this segment of the population. (These issues are discussed in greater detail in the chapter on “Employment and rural development.”)

- **Impact of the economic crisis and price volatility on rural development**

An increase in the coverage and efficiency of public investment in the agricultural sector in rural areas is essential, in order to prevent the deterioration of poverty and indigence rates, and takes on additional importance in the context of the current crisis. If such investment is not made, global food insecurity will increase, with the related social and political risks.

The agricultural and rural population demands more productive investment and social protection,

<sup>5</sup> During the first quarter of 2009, the sharpest drops were in Mexico (in terms of both volume and value), South America (in value), and oil countries (in value).



## Box 2. Fulfillment of the Millennium Development Goals (MDGs) at risk:

The positive economic situation in LAC in 2003-2008 favored the creation of jobs on the formal market, investment in social protection systems, and ultimately the reduction of poverty. In contrast, in the present slow growth scenario, there are fewer job opportunities, which, together with the drop in remittances and high food prices, has engendered an increase in poverty.

The decline in tourism could have an important negative impact on rural economies, especially in those countries where a substantial percentage of tourism is linked to rural amenities, as in the case of ecotourism.

The lower growth reduces employment and income and puts pressure on public finance, thereby affecting social expenditures, which have played a key role in the recent reduction of poverty in the region.

but the government's capacity is limited and diminishes during times of an economic slowdown. In the case of LAC, agriculture has suffered for a long time from a low level of government spending, less than its contribution to the regional economy and below levels observed in economies that have managed to make the leap to increased urbanization and creation of higher quality jobs for their rural population.

To deal with this situation, the priority in public policy matters should be to create jobs, both in agriculture and in the nonagricultural rural economy. The basic ingredients of a dynamic rural economy are rapidly growing agriculture and a favorable investment climate (World Bank, 2008). There is a great growth potential in agriculture in the region, as was demonstrated in recent years with the sharp increase in international prices. However, the climate for private investment is not favorable at present, in view of the sharp contraction in credit and the losses of firms on financial markets.





# Section I: Sectoral analysis



## ***Sectoral context, Agriculture, Livestock, Forestry, Fishing and Aquaculture***

**Latin America has great potential to contribute to global food security**



**Box 3.** Some anticipated trends in food production, consumption, and trade

- Once the global economy recovers, most of the growth in production and consumption of agricultural products will come from developing countries.
- For most agricultural products, imports and exports are expected to increase, and this will have a particular impact on developing countries. In this scenario, South-South trade will become much more important, in view of the projected long-term trends in population growth and income. Global food production should increase by 40% between now and 2030, and by 70% by 2050, as compared with the 2005-2007 average.
- Due to considerable amounts of available land, Latin America is expected to expand agricultural production. However, use of much of this land could entail heavy investments, as well as social risks and environmental costs.
- Persisting structural problems in various developing countries will limit their capacity to produce food. In view of this situation, policy reform and more investment in agriculture are critical.

**Source:** OECD-FAO, 2008.

The definition of the agricultural sector in the national accounts includes both crops and livestock, forestry, fisheries and aquaculture. The quantitative information offered in this section thus refers to the aggregate of these activities.

- **Agriculture continues to play an important role in LAC economies**

Although the share of these activities in the Gross Domestic Product (GDP) has declined in most of the countries in the region over the past three decades, the contribution of agriculture is much greater than is apparent from the national statistics.

Regional agriculture was responsible for around 5% of GDP on average in 2008, with significant differences among countries, fluctuating from close to 1% in various Caribbean Island states to some 20% or more in countries such as Nicaragua (18.2%), Haiti (20.3%), Paraguay (21.2%), and Guyana (30.2%) (ECLAC-Badecon).

In the last decade, this scenario has remained virtually unchanged, except for certain Caribbean states (Dominica, Saint Vincent and the Grenadines, Saint Lucia, and Haiti), where the share fell by more than three percentage points, and in Paraguay, where it increased by over five percentage points in comparison with the 1995-1999 average (see the Statistical Annex).

The general panorama of the region shows that the agricultural sector contributes substantially more to the generation of foreign exchange than to

GDP. In 2000, the regional average of the share of agricultural exports out of total exports was almost 14%, more than double its contribution to GDP (the main exceptions are oil exporting countries, such as Mexico, Venezuela, and Trinidad and Tobago). Agriculture is also an important sector for generating jobs and income in rural areas, especially among the poor. The percentage of persons working in agriculture fluctuates between less than 10% of total employment, as in the case of Venezuela, to over 30% in countries such as Bolivia, Guatemala, Honduras, Nicaragua, and Peru.

In addition, the real contribution of the broadly defined agricultural sector is greater than what is shown in the national accounts, which only records the value added of the primary phases of production. If we add to this the chains—upstream and downstream—of agricultural, livestock, forestry, and fishery activities, the economic contribution of the sector is greater. These chains expand as economies develop, reducing the weight of primary activities.

Studies by Dirven (2002), IICA (2004), and Ferranti et al (2005) provide significant evidence in support of this finding. Using an input-output table, Dirven estimated that in 1996, the direct contribution of the agricultural sector to GDP in Chile increased from 4.4% to 15.1% of total GDP, while its contribution to employment rose from 14.8% to 22.1% of total employment, and its contribution to total exports went from 4.8% to 19.9%.

In a study by IICA, in which multipliers were estimated on the basis of social accounting matrices (SAM) for 11 countries,<sup>6</sup> it was estimated that every unit of the primary sector used generated a derived production that ranged from 3.0 (Canada) to 5.5 (Argentina) additional units. Moreover, it was determined that the positive effect of a one dollar increase in primary agricultural exports on the remuneration of factors of production ranged from 1.4 dollars in Canada to 3.34 in Argentina.

These data show the importance of agriculture in generating household income, through its direct and indirect chains involving other sectors.

Finally, using both input-output tables and social accounting matrices, in a World Bank report, de Ferranti et al estimated that the contribution of the agricultural sector to GDP increased from 4.5% to 9.3% in Chile (1996 input-output table), from 14.4% to 18.5% in Colombia (SAM - 2000), and from 5.3% to 8.0% in Mexico (input-output table - 1980 and GDP- 2000).

The role of agriculture and the rural sector as generators of employment and engines of growth is essential during recessions (see macroeconomic context). However, at the present time, the capacity of agriculture and the rural environment to mitigate the negative impact of the crisis and contribute to recovery is limited by the low levels of investment in it for at least the past two decades. In view of this situation, throughout this paper we emphasize the need to increase investment in the agricultural sector and in rural areas in general, both in terms of quantity and quality. This investment should favor the creation of decent work and territorial cohesiveness, and help safeguard the environment and improve living conditions in rural areas. In short, it should contribute to inclusive agricultural and rural development.

It should also be noted that an important characteristic of agriculture in Latin America and the Caribbean is its structural heterogeneity, both among and within countries. At both levels there is a diversity of production units and systems that differ on the basis of agroclimatic conditions, scales of production, use of technologies, and access to resources. This diversity reflects different policy needs and potentials, in the following areas, among others: a) provision of public goods for the primary sectors (e.g., investment in agricultural R&D) and for environmental protection, to ensure that expansion in production is consistent with environmental goals; b) efficiency in public expenditures (e.g.,

<sup>6</sup> Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Mexico, Peru, Uruguay, United States, and Venezuela.

evaluation of investments, governance of agricultural institutions); c) integration of small producers into already established productive and commercial chains; d) promotion of public-private alliances to encourage production, employment, and integration into markets; e) policy differentiation, based on the type of producers and territories; f) development of the potential of the domestic market vs. exports; g) integration of sectoral policies, beyond production, to include education or integrated production systems, for instance; and, h) implications for integration of institution frameworks at national, regional, and local levels.

### ● Recent developments in the sector

The evolution of the agricultural sector during this decade has been uneven, with a general contractionary trend in the Caribbean (except in Antigua and Barbuda, Suriname, and Trinidad and Tobago), and an increase in the rest of the region.

In the first half of the decade, the increase in the agricultural value added for the entire region was, on average, greater than the growth of the total regional GDP (3.1% vs. 2.6%), and this was also true for a large number of countries, including the three principal agricultural economies in the region (Brazil, Mexico, and Argentina, respectively).

During 2005-2008, the sector's high growth rates remained above those for the previous period (2000-2005) in the regional aggregate (4.1% vs. 3.1%), although they were less than the GDP growth rate (4.1% vs. 5.2%). In various countries, the sectoral growth rates were over 5%, and in some cases higher than global economic growth (Brazil, Ecuador, El Salvador, and Paraguay).

In 2008, the sector's growth rate decreased for the region as a whole, but it remained dynamic in various countries. For instance, from 2005 to 2007, the sector grew at higher rates in Brazil, Mexico,

Bolivia, Ecuador, Nicaragua, Panama, Peru, and Uruguay, and at rates higher than GDP growth in Bolivia, Brazil, Colombia, Cuba, El Salvador, Mexico, Nicaragua, and Venezuela. Negative growth was recorded only in Argentina, Costa Rica, and the Dominican Republic, and in a number of Caribbean economies.

Taking the total for the decade, two trends in the sector's evolution can be identified: in the first place, the drop observed in the aggregate for the Caribbean, to increasingly more negative rates; and, in the second place, the dynamic performance of Brazil, Bolivia, and Paraguay, with growth rates rising above the GDP in all the periods considered. The sector's growth was highly influenced by expansion of the soybean crop in these three countries, where the area under cultivation increased by 7.8%, 9.3%, and 10.4%, respectively, between 2000 and 2007.<sup>7</sup>

### ● Latin America can contribute even more to global food security

Various LAC countries currently account for an important share of global agricultural production and trade. The most notable cases are Argentina and Brazil, especially in grains and oilseeds. Argentina ranks first in world soybean oil exports, third in corn and soybeans, fifth in wheat, and sixth in grains. Brazil is the largest exporter of meat, ground coffee, and sugar, and is second in soybeans and soybean oil and fourth in corn.

However, other countries also stand out in specific segments. For instance, Chile ranks fourth in apples and fifth in wines, Colombia is second in ground coffee exports and fourth in bananas, Costa Rica ranks first in pineapple exports and third in bananas, Paraguay holds fourth place in soybean exports, Bolivia is seventh in soybean oil, Uruguay is eighth in rice, Honduras in ninth in pineapples, and Ecuador and Guatemala are first and sixth in banana exports, respectively.<sup>8</sup>

<sup>7</sup> Argentina also experienced considerable growth in GDP, also influenced by the growth in soybeans (8.6% from 2000 to 2007), but its agricultural value added dropped between 2007 and 2008.

<sup>8</sup> Based on FAOSTAT data.

**Table 1.** Average annual rates of change in the Gross Domestic Product and the Agricultural Value Added, by country

	2000-2005		2005-2008		2007-2008	
	GDP	VAA	GDP	VAA	GDP	VAA
<b><i>Caribbean</i></b>	<b>3.9</b>	<b>-0.6</b>	<b>4.3</b>	<b>-0.9</b>	<b>2.3</b>	<b>-1.5</b>
Antigua and Barbuda	4,4	1,8	8,3	3,0	2,5	2,8
Bahamas	0,5	-2,6	3,0	-5,2	1,5	1,0
Barbados	1,4	-3,5	2,7	-1,4	1,5	-0,7
Belize	5,4	9,4	3,2	-8,6	3,8	2,9
Dominica	0,7	-1,6	4,0	-1,0	3,4	0,0
Grenada	2,2	-8,3	1,2	14,0	2,1	14,3
Guyana	0,5	2,3	4,5	0,3	3,1	-5,8
Jamaica	1,5	-2,6	1,2	0,0	0,0	-6,0
Saint Kitts and Nevis	3,3	3,7	6,3	-5,5	9,7	-2,7
Saint Vincent and the Grenadines	3,5	-2,4	6,0	2,6	1,0	-7,3
Saint Lucia	2,6	-13,4	2,5	5,8	2,3	7,2
Suriname	5,4	2,5	5,4	2,5	5,0	3,5
Trinidad and Tobago	8,6	-3,9	6,9	1,3	3,5	11,0
<b><i>Latin America</i></b>	<b>2,6</b>	<b>3,2</b>	<b>5,3</b>	<b>4,1</b>	<b>4,2</b>	<b>3,6</b>
Argentina	2,0	2,9	8,0	3,5	7,0	-1,5
Bolivia (Plurinational State of)	3,1	3,5	5,2	3,9	6,1	8,2
Brazil	2,8	4,2	4,9	5,4	5,1	5,8
Chile	4,2	7,0	4,1	2,6	3,2	2,1
Colombia	3,9	2,6	5,7	3,5	2,6	2,7
Costa Rica	4,1	2,0	6,5	5,0	2,9	-2,3
Cuba	5,0	-2,3	7,8	5,2	4,3	5,0
Ecuador	5,4	4,9	4,3	4,9	6,5	5,4
El Salvador	2,3	1,2	3,8	7,8	2,5	7,3
Guatemala	3,0	3,0	5,0	2,4	4,0	2,0
Haiti	-0,5	-1,0	2,3	-0,5	1,3	-5,7
Honduras	4,7	2,7	5,6	5,5	4,0	3,4
Mexico	1,9	2,2	3,2	3,0	1,3	3,2
Nicaragua	3,2	2,9	3,6	3,4	3,0	5,5
Panama	4,3	4,6	9,7	3,9	9,2	6,0
Paraguay	2,6	5,4	5,7	8,7	5,8	8,5

Cuadro 1 (continuación).

	2000-2005		2005-2008		2007-2008	
	GDP	VAA	GDP	VAA	GDP	VAA
Peru	4,2	2,7	8,8	6,1	9,8	6,7
Dominican Republic	3,5	3,4	8,1	2,0	5,3	-3,4
Uruguay	0,9	4,5	7,0	1,1	8,9	5,7
Venezuela (Bolivarian Republic of)	2,6	2,7	7,8	3,2	4,8	5,6
<b><i>Latin America and the Caribbean</i></b>	<b>2,6</b>	<b>3,1</b>	<b>5,2</b>	<b>4,1</b>	<b>4,2</b>	<b>3,6</b>
<b>Source:</b> ECLAC, on the basis of official information (Economic Statistics and Indicators – BADECON) – using information revised on May 8, 2009. Notes: preliminary figures						

Moreover, Latin America has a great potential to increase agricultural production, hence to contribute to global food security, since it is one of the few regions in the world with enough available land and water to increase farm production. It is estimated<sup>9</sup> that the region has about 21% (416 million hectares) of land with adequate or highly adequate potential for agricultural use that was not under cultivation around 2000, and that is not part of forest ecosystems (2.541 billion ha.), a percentage surpassed only by Africa. This represents 2.6 times the amount of land under cultivation in the region (159 million ha.), with and without irrigation (Fischer et. al., 2001). However, this potential is concentrated in the countries in the southern part of the continent, and especially in Brazil, Argentina, Bolivia, Colombia, Uruguay, Paraguay, Peru, and Venezuela.

The possibility of bringing these lands under production will require investments that may be significant, both for development of the lands and mitigation of environmental impacts (e.g., reduction of the carbon footprint), and for infrastructure, as well as research, innovation, and extension services, especially if this development is to be inclusive. In addition, there is a possibility of environmental and social conflicts, since the region also has a large amount of suitable or highly suitable land that is currently part of forest ecosystems (281 million ha.), or 47% of the world total (601 million ha.).

It is also important to consider alternative uses of land with a potential for food production outside forest ecosystems, including production of biofuels



#### Box 4.

#### G8: \$20 billion increase for rural areas

At its recent meeting in L'Aquila, Italy (July 10, 2009), the leaders of 40 countries and international organizations expressed alarm at the growing number of undernourished persons and at the inadequate level of investment in agriculture, and stated that they considered the "global food problem the most important item on the G8's agenda."

The agreement will grant \$20 billion to poor countries over three years, to support agricultural development. The strategy seeks to ensure that poor subsistence farmers produce more than their own food supply by improving productivity, rather than by focusing on an aid-based approach. The plan provides for new answers to food insecurity, regarded as a threat to political stability, and also responds to the expected increase in the planet's population of around two billion persons in the next 20 years.

Source: "L'Aquila" G8 Joint Statement on Global Food Security, L'Aquila 10 July 2009

<sup>9</sup> The data are taken from the study by Fischer, et al (2001), in which he used a modelling approach based on geographical information systems, where land evaluation methods are combined with criteria for socioeconomic analysis. The data correspond to around 2000.



and forests, or urban use. In the case of lands within forest ecosystems, there is a considerable economic potential in the context of carbon markets, under schemes that may be developed in the near future and are currently under discussion within the framework of the Climate Change Convention (e.g., prevention of deforestation). This could provide an important opportunity for resources for rural populations, who could become the guardians of these ecosystems, with economic, social, and environmental benefits.

- **There are economic factors preventing an increase in short-term production**

The extreme volatility of commodity prices (see the special section), and the high costs of production and inputs, together with credit restrictions, deter long-term agricultural investment as well as production, and set the stage for new food crises (Von Braun, 2008). Investment in productive infrastructure is hampered by the difficulty in predicting the timing of capital recovery, and ultimately its economic return. In view of this uncertainty and the shortage of capital, financial institutions are restricting credit, reducing opportunities to develop investment.

It is therefore necessary to protect capital formation in agriculture from any significant adverse effects generated by the current crisis situation, involving either cancellation or deferral of investments and programs directed to basic agricultural infrastructure, or activities that indirectly benefit agriculture (as is the case with infrastructure and sectors related to agriculture). In the private sphere, many farmers who had benefited from high prices and who responded to the new conditions by making investments could now face problems in repaying their debts in this new scenario.

According to FAO, between 1985 and 2001, agricultural and rural public spending in Latin America and the Caribbean (19 countries) decreased from \$205 to \$140 per capita, although this drop was not seen in most of the countries studied (Soto, et al, 2006). Perhaps even more relevant is the fact

## **Box 5.** Reduced funding for public agricultural research

Financing for agriculture fell significantly during the last two decades, and this has particularly affected agricultural research. The reductions are seen in both bilateral and multilateral financing, as well as in public expenditures for agriculture in developing countries (United Nations, 2008).

Despite the fact that development aid has been an important source of financing for agricultural R&D, since the 1980s agriculture has lost its place on the list of priorities for bilateral financing. As a percentage of total bilateral aid, agriculture's share diminished from 15.2% in 1988 to only 4.2% in 2003 (Pardey, et al, 2006, p.21).

Also, Pardey, et al (2006) indicate that cuts in public financing of agricultural research in developed countries could restrict the spillover of ideas and new technologies from developed to developing countries. Further, they point out that this situation could be exacerbated by reductions in financing by developed countries to support agricultural research in developing countries. The depth of this trend could limit their possibility of obtaining productivity gains in important food crops, since developed countries still contribute around 40% of financing for global agricultural research. In fact, along with the drop in agricultural R & D financing, a tendency toward stagnation of the yield on some crops, especially corn, wheat, and rice, has been observed in recent years.

Asia is the only region in the developing world that showed an increase in government spending on agriculture during the 1980-2000 period, with a tripling of that spending in real terms. In contrast, LAC is the only region in the developing world where these expenditures have gone down in absolute terms, although a recovery trend has been noted since 1990 (Akroyd & Smith, 2007).

In LAC, a recent study estimates that spending on agricultural research in PPP dollars in 2005) in 27 LAC countries increased at an average annual rate of only 1.05% from 1981 to 1986. Moreover, from 1991 to 2001, growth was virtually nil (0.02% annually). The three largest countries in the region (Argentina, Brazil and Mexico) accounted for almost 75% of spending (Stads & Bientema, 2009).

that the spending structure favors efficiency, by giving preference to public goods over subsidies. In this context, it is noteworthy that between 1985 and 2001, in the region on average, the trend was towards a greater share of public goods and a growing delinking of transfers. This was not the situation in all countries, however.<sup>10</sup>

Market defects and the retraction of public spending have created a serious shortage of investment in agricultural research and development (see Box 5). This contraction is linked to a drop in the rate of increase in productivity for some crops, and is in turn one of the reasons why the growth in supply has been inadequate to meet increased demand. Consequently, if increases in productivity are needed if agriculture is to play a dynamic role in the region's economic recovery, investment in the generation and dissemination of specific technology for family production will be required.

Moreover, the role of public spending as a determining factor of private investment in agriculture cannot be ignored, due to the link between capital formation and agricultural growth, and between this and reduction of rural poverty (Bisaliah, 2008). And, it is not just the amount of public spending that is important, but also its structure (Soto et.al. 2006), which should favor the financing of public goods.

### ● A global vision is needed

The need to increase the world supply of agricultural products creates technological challenges, because growth must be achieved with a limited environmental impact. This poses challenges to institutions involved in organizing networks for the generation and transfer of technology from developed to poorer countries. The financial resources available in developed countries, which are currently being used to maintain high levels of subsidies to protect domestic agricultural production, would be better used in developing countries more suited to agriculture, where there is a shortage of capital of all

types for technological development and sustainable agricultural growth.

After experiencing the food crisis of 2008, countries should be more aware that the problem of availability of and access to food affects everyone, and that it cannot be solved just by closing borders to trade in products or by giving heavy support to domestic production. These policies tend to aggravate the problem in the long run. In contrast, international cooperation is in the best position to contribute to agricultural and rural development, in a context in which financial and technological resources are reserved for the greatest growth potential of this activity.

In addition, the policies adopted by various countries both within and outside LAC in response to the sharp increase in food prices in mid-2008 revealed the institutional risks involved in a crisis of this type. The danger of a sudden, substantial increase in global food insecurity will continue to be present as long as no progress is made in addressing structural issues that now limit the growth in the world food supply, especially in developing countries (low investments in agriculture and the low productivity of most producers). This scenario could cause a resurgence of protectionist policies, as countries try to safeguard their domestic food supply and national employment. It would jeopardize the progress in trade liberalization achieved in the past 25 years, especially as it relates to inclusion of agriculture in international agreements and to reaping the benefits derived from international trade.

It is also important to point out that in future, agriculture will be facing an increasingly complex international environment, due to the need to comply with stricter plant and animal health standards. The tightening of this type of standards, with limited national capacities, could restrict the export potential of many countries in the region. This is compounded by the increasing importance of private standards in developed countries, and especially in the environmental area. These standards are generally imposed by supermarket chains to meet the demands of consumers, who

<sup>10</sup> More recent information on agricultural and rural public spending is not available.

are more and more exacting and concerned about global environmental problems.

One area in which private standards are taking on growing importance has to do with the “carbon footprint” (i.e., the generation of greenhouse gases throughout the whole production chain). This is seen in labeling, with information on emissions and emission certification, and generally is first applied to food products. Thus it could have important implications for LAC, where agro exports carry a great deal of weight in many economies. For developing countries, initiatives of this type arise in the context of concerns over climate change and other related global environmental changes, such as deforestation. For LAC countries, they have implications for trade and productive development, and ultimately for public policies in these areas.

- **Agriculture facing challenges linked to energy supply and climate change**

Energy supply and climate change are the two challenges that will be increasingly confronting agriculture in the coming years. Energy consumption is estimated to increase by 50% between 2005 and 2030, and the price of oil in the long run is expected to stabilize at around \$70 a barrel (IEA, 2008).

Given this situation, the higher priority given to energy supply (biofuel production) on international agendas places agriculture at the center of the debate. In fact, the increased production of biofuels was one of the causes of the spike in food prices in recent years. The debate is heating up, because in many developed countries, the growing use of biofuels has been driven by subsidies to both producers and consumers, and because in many cases, raw materials also important as food, such

as corn, are used to produce them (FAO, 2008f). Although the subject of biofuels has lost ground in the past year, it will undoubtedly return to the fore, once the world economy recovers and oil prices go back up.

The region could use this situation to its advantage, as many of the countries have the potential to produce biofuels, especially bio-ethanol from cane sugar, since it is a known technology and the raw material is produced in virtually all of them. Brazil is well known for its global leadership in developing a biofuel industry linked to sugarcane production, due to the long time span entailed and the comprehensive nature of the effort.<sup>11</sup> Moreover, the debate will certainly arise again around the possible trade-off between food and biofuel production, and its implications for the price of food and global food security.

In fact, the increase in energy demand favors the biofuel sector, and from 2008 to 2017, production of both ethanol and biodiesel are projected to increase substantially, by 5.2% and 6.6%, respectively,<sup>12</sup> driven by the behavior of oil prices and by the institutional evolution of biofuels (e.g., international agreements, creation of a market, and political support).

The challenge is to invest in the development of technologies that will significantly improve the yield in processing raw materials and in the creation of biofuels capable of using organic agricultural waste based on more advanced technologies, as well as in the possibility of producing biofuels from raw materials that can be grown on land that does not lend itself to food production.

Climate change is another factor that exacerbates uncertainty in the agricultural sector, due to the risks that the change poses for long-term rainfall and temperature trends, and the increased incidence of extreme climatic conditions. In

11 *The process has been going on for over 30 years, and has involved the entire production chain, from research and development of varieties suited to different climate conditions, and improvement of the efficiency of production in its different agricultural and industrial phases, to development of the automobile industry. For more detailed information, see: BNDES, CGEE, FAO, ECLAC (2008).*

12 *According to FAO-OECD (2008) and BNDES, CGEE, FAO, and ECLAC (2008)*

LAC, this subject should be relevant in most countries, since agriculture is an important sector throughout the region, and the effects would not be negative in all cases. For instance, crops that could gain from this change, such as soybeans in South America, have been identified in the region, as have potentially losing crops, such as rice. Also, the greatest negative impact is expected to occur in countries located in tropical and subtropical zones. For these countries, the priority in the area of climate change and agriculture is adaptation, although these are usually the countries least prepared to adapt. (Magrin, et al, 2007).

In a context of increased climate variability many farmers without insurance are at risk of losing everything due to extreme events like flooding or hurricanes. Disaster evaluations carried out by ECLAC show that agriculture is one of the sectors hardest-hit by extreme weather-related events. Agriculture and livestock losses caused by Hurricane Mitch, for example, which struck Central America in 1998, accounted for 21% of total losses in Nicaragua, 39% in El Salvador, 51% in Honduras and 68% in Guatemala (IICA et.al. 2005)

The trends described above will also have enormous repercussions on non-agricultural activities, positive and negative, depending on local circumstances, not only through the productive linkages of agriculture, agro-industry and infrastructure and related services, but also through the consumption of households depending on income from those activities.

Political awareness about climate change has increased in recent years but so far government policies to adapt to the new climate scenario are scarce. Farmers can adapt to climate change at a local level by, for example, changing crops or plant varieties in response to changing precipitation patterns, using different harvest and planting/sowing dates or relocating. Those autonomous adaptations, however, can be environmentally

counterproductive, especially relocation, if they are not guided by adaptation policy frameworks that are multi-sectoral in nature.

Thus, international and national public investment designed to improve the capacity of agriculture to adapt is a novel prospect and absolutely essential for the agricultural and rural sector of the region. Genetic improvement of traditional varieties and development and dissemination of new varieties better adapted to foreseen climate changes, provision of infrastructure to manage water shortages and surpluses (e.g., irrigation and drainage), development of insurance plans that protect small producers from climate risks, and early warning systems are some potential areas for investment that would not only improve the capacity of agriculture to adapt to climate change, but would also help make it more competitive. In that case, there would have to be a significant increase in resources and projects that would positively coordinate an environmental and social approach to adaptation and reduce the mutual effects between agriculture and climate change, with “traditional” agricultural and rural investment creating important synergies for the sustainable development of this activity. This would undoubtedly make a key contribution to inclusive development, and not only in the rural environment.

- **Some recent policy responses to the international crisis<sup>13</sup>**

Various countries have implemented policies to support the agricultural sector, as part of the measures to cope with the impact of the international crisis. The following list is illustrative of the type of activities developed:

**Brazil:** \$6.47 billion in support to the agricultural sector, including: \$2.190 billion in advances by the Bank of Brazil; \$2.410 billion increase in resources banks allocate to the agricultural sector;

13 Based on ECLAC (2009a), using information as of May 31, 2009.

increase in the quota of the compulsory deposit on rural savings from 65% to 70%, equivalent to \$1.090 billion; use of \$220 million in resources from constitutional funds; \$440 million in aid to agricultural cooperatives; and, allocation of \$150 million from the Worker Protection Fund to family agriculture.

**Bolivia:** increase in budget allocations, with agricultural production projects valued at \$150 million, equivalent to 8.1% of the budget.

**Chile:** increase in incentives for forestry and support for the salmon industry (Decree-Law 701), through credit guarantees granted by the Production Development Corporation (CORFO) totaling \$120 million.

**Guyana:** support for the sugar and rice sectors; increased support to the agricultural sector, especially through the “Grow More” campaign, the Agricultural Export Diversification Programme, and the Rural Enterprise and Agricultural Development Program; direct intervention in the flour, rice, and sugar markets through cash transfers to producers and suppliers and subsidies.

**Honduras:** measures adopted in 2008 to increase available productive resources in the agricultural sector, specifically to guarantee the supply of basic grains and avoid price speculation; loans of up to \$30 million to agricultural producers; \$42 million in bonds for payment of agrarian arrears and titles to urban property; \$32 million in support for the social sector of the economy, to finance micro- and small agricultural enterprises.

**Mexico:** under ANFEFE, 10% increase in credit to the rural sector, through Financiera Rural

and Fideicomisos Instituidos en Relación con la Agricultura (FIRA), up to \$5.945 billion. In addition, to compensate for damages caused by swine flu, \$71 million went to hog farming.

**Panama:** \$17 million allocation to strengthen the Food Production Program; simplification of procedures to receive exemption benefits for essential goods for the agricultural sector; and, tax exemptions granted.

**Paraguay:** development of a policy to support the agricultural sector to reduce the impact of the drought and insure the 2009/2010 crop. This includes credits, technical assistance, and seed distribution; \$50 million allocation to the Financial Development Agency to finance the crop and exports; establishment of an agricultural development system and preference margins in government and municipality contract processes; application of preference margins of up to 70% in favor of agricultural products coming from the family subsistence production system; establishment of \$30 million in lines of credit for 30,000 small producers (150,000 recipients).

**Dominican Republic:** increase in financing granted by the National Housing and Production Development Bank (BNV) for development of the sector; subsidies equivalent to 0.17% of GDP; exemptions granted on advance payment of taxes on income and assets, and withholding of the income tax from payments made by the state.

These activities show that the sector was given important consideration during the current crisis. Public policies are discussed in greater depth in the special section, with reference to the problem posed by increased price volatility.





# Agriculture

## Three pending tasks: increase yields, include small-scale farming, and prepare to deal with climate change



### FACTS

- The Americas is a powerhouse in production of grains, oilseeds, and sugar, products that represent 68% of the world's daily calorie consumption. The United States and Canada account for most of the production of these items, although Latin America and the Caribbean (LAC) are increasing their share, thanks to the contribution of the Southern Cone countries.
- In 2007, LAC contributed over 27% of grain production, and more than 56% of the production of oilseeds and vegetable oils in the Americas. Despite this increase, the majority of LAC countries continue to be highly dependent on imports of these products.
- With the exception of the Southern Cone, all the regions of LAC are net importers of grains; in fact, net imports of grains in the region have increased at an average annual rate of 6.7% since 2000.
- The subregions of the Caribbean, Central America, the Andean region, and Mexico, in that order, are highly dependent on grain imports to supply their domestic market. In 2007, the share of imports in the domestic supply fluctuated between 32% (Central America) and 51% (Caribbean) in vegetable oils, and between 31% (Mexico) and 51% (Central America) in the case of grains (FAOSTAT).
- For sugar, the situation is different, since over 96% of sugar cane production is concentrated in LAC.
- According to FAO-IDB studies (2007), the share of small and medium-scale agriculture with scarce assets<sup>14</sup> in the sector varies from 27% in Chile to 76% in Nicaragua, while the share of sectoral employment ranges from 57% in Chile and Colombia to 77% in Brazil.<sup>15</sup>

### Recent trends

#### *South America leads agricultural performance in LAC*

According to FAO data (2009a), the gross value of agricultural crops in LAC amounted to \$110 billion in 2005, and accounted for 11% of the value of crop production worldwide. Because of its vast land areas and its competitiveness in grain and oilseed production, South America is not only the subregion with the largest share of crop production in LAC (80%), but also the area with the largest growth in the value of its output (22% on average for 1999-2001), more than 10% over the growth for the Americas and the world.

The crops that cover the largest area under cultivation in LAC are, in order of importance, soybeans, corn, wheat, sugarcane, and dried beans. Of these, soybeans and corn are the ones with the highest average annual growth rates in the past 20 years (7.5% and 3.4%, respectively). In the case of soybeans, 20% of this increase can be explained by the inclusion of newly seeded land in the Southern Cone, while the growth of corn production is attributed exclusively to increased yields, since the land under cultivation has remained virtually unchanged.

What is happening with corn is repeated in grain and oilseed production, since, as a result of application of technological innovations, commercial agriculture in the Southern Cone has managed to achieve yields that have contributed as much to production increases as in the most productive regions of the world. However, these same countries have enormous technology gaps between large commercial agricultural enterprises and small-scale agriculture, where many production systems still use traditional technologies.

<sup>14</sup> In general terms, this refers to subsistence farming, small and medium scale agriculture, and family agriculture, and their different modalities (subsistence, consolidated, and transitional family farms), according to FAO/IDB (2007).

<sup>15</sup> In Brazil, family farms produce over 67% of beans, 84% of yucca, 49% of corn, and 52% of milk; in Colombia, they provide over 30% of annual crop production, and in Ecuador, they cover 64% of potato production, 85% of onions, 70% of corn, 85% of sweet corn, and 83% of lamb production.



A different reality—with a much smaller use of technologies—is seen in agriculture in the Caribbean countries, Central America, and the Andean region, as it consists in a mixture between production of basic grains for domestic consumption and production of tropical fruits, roots, tubers, and coffee for export.

### *Two agricultural realities: the northern and southern regions vs. the tropical belt*

The increase in international prices of agricultural commodities in 2007 and the first half of 2008 had highly divergent effects on LAC agriculture. During

this period, prices of grains and oilseeds recorded the highest growth, while tropical fruits and sugar increased to a much lesser extent.

The rise in grain and oilseed prices widely benefited agriculture in the Southern Cone countries, such as Argentina, Uruguay, and Brazil, where their agricultural exports underwent a huge price increase, while the price of their imports of tropical products did not grow significantly. As a result, this group of countries improved its agricultural terms of trade (Tot) and its level of international monetary reserves (IMR).<sup>16</sup>

In contrast, Central America, the Caribbean, and the Andean countries, which make up the tropical belt, did not benefit from significant increases in the prices of their primary agricultural exports—tropical fruits, roots and tubers, coffee, and sugar—and had to pay much more for their main agricultural imports, mainly grains and oilseeds. Consequently, these countries were harmed from the standpoint of both their agricultural terms of trade and changes in their international monetary reserves. This in turn exacerbated access to and the availability of food for their people.

### *Biotechnology in the hands of a few*

Since biological research is highly complex and requires enormous investments, the vast majority of genetic transformation technologies used in agricultural production are private goods in the hands of transnational firms. The scanty participation of governments in generating and disseminating these technologies causes a serious problem of access to them and of their availability on national markets, which considerably limits any attempts to develop the potential of small- and medium-scale agriculture in the region.

Nine of the 25 main producers of genetically modified crops are located in Latin America (Argentina, Brazil, Paraguay, Uruguay, Chile,

#### **Box 6:**

#### Asia: a strong competitor of the tropical belt in LAC

For 2000-2007, the countries of East and Southeast Asia increased their citrus production at average annual rates of 10%, while Central America was the LAC region that attained the highest growth rate in citrus production, at less than 1.5% a year.

In tropical fruit production, the highest growth region in Asia (East Asia) tripled the growth rate of the best LAC region (central region). In vegetables, and in roots and tubers, the Asian regions doubled the growth rates for the best-performing regions of LAC.

In citrus fruits, Asia produced 27% of the world total in 2000, and 39% in 2007. Asia's increased share of world citrus production was mainly at the cost of LAC, which saw its share of the world market for that product decline by 5%.

<sup>16</sup> For example, in Argentina, the agricultural Tot increased by over 15% in 2007, while in Brazil, IMR measured in food import months rose from 260 to 403 that same year.

Colombia, Honduras, Mexico, and Bolivia), which together account for 33% of the land cultivated with this type of crop in the world (Clive, 2008). However, within this group of countries, only Brazil, Mexico, and Argentina have a substantial capacity to use both modern and conventional technologies (IFPRI, 2009). Colombia, Chile, Peru, Costa Rica, and Uruguay have an intermediate capacity to use conventional and modern biotechnologies, while the rest of the Central American countries and Bolivia, Ecuador, Paraguay, and the Dominican Republic have little or no capacity or facilities for use of biotechnologies.

Among the main biotechnological crops in the region are herbicide-tolerant soybean varieties, insect-resistant (IR) and herbicide-tolerant corn (HT), and high-lysine corn, and IR and HT cotton.

## ● **Agricultural outlook**

### *Tropical belt most affected by the crisis*

Following the increase in international commodity prices and its differentiated impact on agriculture in the Southern Cone countries versus the tropical zone, there is reason to believe that the impact of the economic recession will be more harmful to tropical agriculture. This is because demand for exports of fruits, coffee, roots, tubers, and vegetables is more responsive to changes in income of the destination markets, and in the current scenario this income is reduced by the recession.

However, the final impact of the economic recession on the demand for agricultural products from the tropical belt countries will depend on the following factors, among others:

a) *Length of the recession:* If it is a short-term recession and does not allow consumers to adjust their tastes and preferences to their reduced income, agricultural exports of tropical countries will not change



## **Box 7:**

### **Tropical belt: the most vulnerable to climate change**

In addition to suffering to a greater extent from the impact of the economic recession, agriculture in the tropical and subtropical countries could be more adversely affected by climate change. (Cline, 2008). Vulnerability to the effects of climate change is greater in these tropical countries because agriculture, like other activities sensitive to climate change, such as hunting, fishing, and tourism, the forestry sector, and the like, occupies a more important place in national production, temperatures are close to the limit of tolerance of commercial agriculture, and it is more difficult for these countries to adapt to and mitigate the impact of climate change, especially due to costs and institutional shortcomings.

substantially. However, if the recession lasts a long time and income reductions trigger substitutes in consumption, agricultural exports of tropical fruits, roots, tubers, and coffee will be seriously affected.

- b) *Inclusion of tropical products in diets:* a growing awareness of healthful food means that tropical products, such as bananas, other tropical fruits, and coffee, are now an integral part of the diet in the United States and Europe. This new reality could mean that the anticipated reduction in income of countries will have less of an impact on demand for tropical products in the destination markets.<sup>17</sup>
- c) *Positioning of agricultural exports of LAC in niche markets:* since niche markets, including organic products, ethnic markets, and fair trade, have higher income levels and differentiated tastes, it is possible that with the contraction of the economy, the demand for agricultural products on those markets will vary to a lesser extent than on other international markets.

<sup>17</sup> Fruits, coffee, roots, tubers, and vegetables have high income elasticities and low price elasticities, in contrast to grains, oilseeds, and vegetable oils.

**Table 2.** Grain Production in Latin America and the Caribbean  
(millions of tons)

	Wheat			Secondary grains			Rice (hulls)			Total grains		
	2007	2008 estim.	2009 forecast	2007	2008 estim.	2009 forecast	2007	2008 estim.	2009 forecast	2007	2008 estim.	2009 forecast
<i>LAC</i>	26,8	22,1	23,0	128,2	137,0	119,1	24,5	26,5	27,0	179,5	185,7	169,1
<i>Central America and the Caribbean</i>	3,6	4,2	3,6	34,8	35,8	34,2	2,5	2,5	2,6	40,8	42,5	40,4
Mexico	3,6	4,2	3,6	30,4	31,6	29,9	0,3	0,3	0,3	34,3	36,1	33,8
<i>South America</i>	23,2	17,9	19,4	93,4	101,3	84,8	22,0	24,0	24,4	138,6	143,2	128,7
Argentina	16,3	8,3	11,0	26,6	27,0	17,9	1,1	1,2	1,3	44,0	36,6	30,2
Brazil	4,1	6,0	5,1	53,9	61,4	53,7	11,3	12,1	12,5	69,3	79,5	71,3
Colombia	0,0	0,0	0,0	1,8	1,8	1,8	2,4	2,6	2,6	4,2	4,4	4,4

**Source:** FAO, 2009a.

Estim = estimates.

***Grain output will decline, but once the crisis is over, demand will remain buoyant***

After a record harvest and an increase in the stocks of grains in the world in 2008/2009, the outlook is for about a 3.1% reduction in output in 2009.

In LAC, 2009 grain production is estimated to go down by about 8% from 2008 levels (FAO, 2009a). Despite the fact that the vast majority of countries developed programs to increase food production in 2007/2008, various factors, such as reductions in seeded land (6% less than in 2008) and a prolonged drought at the end of 2008 in the Southern Cone, caused yields to decline by 11% in the primary producing areas.

LAC grain production in 2009 will also be affected by the intensive rainfall in Guatemala and Nicaragua at the end of 2008, limited access to diesel fuel during the seeding season in Bolivia, widespread competition for farmlands, the upward trend in prices of the main agricultural inputs, and the reduction in credit for agriculture.

However, rice production will achieve an unprecedented level, with an approximate 3%

increase over the previous harvest. Thus, anticipated increases in grain production in Brazil, Bolivia, and Venezuela could offset the reduced production in Argentina and Uruguay (FAO, 2009a).

On the demand side, grains and oilseeds will be less affected by the income decline in destination markets, which makes it likely that the main agricultural exports of the Southern Cone countries will not be affected to a great extent by the economic recession (IMF, 2009c).

***Uncertainty over the earning capacity of LAC agricultural producers***

Economic revitalization will stabilize and subsequently raise once again the international prices of agricultural raw materials. However, the policy measures adopted by countries to stabilize, control, and reduce domestic price volatility, together with their international trade policy and local market defects, could prevent high international prices from being reflected in national markets.

In addition to not benefiting from the rise in food prices, agricultural producers could face increased costs, since a scenario of a sustained increase in

the price of fertilizers for the next 3 or 4 years is foreseeable (FAO, 2008e). This is due to the pressure of the estimated 2% per annum increase in world demand for agricultural inputs, such as fertilizers, herbicides, insecticides, and fungicides, for the period 2008-2012. LAC will not be the exception; in this region, the increase in demand is expected to rise to 3.5% a year for the same period, according to FAO estimates. This situation could worsen if the strong reliance on imported fertilizers facilitates the transmission or pass-through of these prices to national markets.

However, in the medium and long run, the price of fertilizers will also depend on the price of oil and the adoption of new agricultural technologies to increase the production and efficiency of fertilizers (including biotechnology).

***New international market conditions will influence the agricultural performance of LAC***

The revitalization of the global economy will stimulate demand for the principal crops exported by LAC. On the one hand, global demand for grains and oilseed, the main exports of the Southern Cone, will rise thanks to the increased use of crops for biofuels and to growth in the production of animal protein. On the other hand, the demand for tropical products will be boosted by an increased demand for health products (low in carbohydrates and fats) and by an increase in consumption of fruits and vegetables by fast growing developing countries (primarily China and India).

Nevertheless, the consolidation of international markets for tropical products will depend on the producers' capacity to meet the required technical health and quality standards, to establish traceability mechanisms, and to achieve the necessary production volumes, among other things. Otherwise, the tropical countries of LAC could lose ground to new competitors in fruit and vegetable markets, especially the Asian countries.

LAC commercial agriculture has successfully gained a position on world markets, and it has made substantial contributions to the world food supply. This agriculture, which is integrated into international agrifood chains, could increase its contribution to future food security even further. But this is not the only way: small-scale agriculture, with less access to productive assets, has a great productive and commercial potential, due to the fact that it has considerable margins for increasing its contributions to food security. If this agriculture were strengthened, not only would it increase the supply on national and regional markets, but it would also increase the income of the rural sector, thereby improving its access to food.

● **Policy recommendations**

In times of crisis or economic recession, agriculture has acted as a buffer for the economy, not only because it absorbs a large number of the unemployed in other sectors, but also because its activity is not reduced to the same extent as other economic sectors.<sup>18</sup>

Nonetheless, this panorama shifts to the negative if, with the arrival of workers from other sectors, agricultural production levels fail to increase, leading to an inevitable process of “redistribution of poverty.” Thus, short-term anti-recession policies should include improved efficiency and increased investment in rural areas. Only in this way can the yield and income of every new worker increase, thereby enhancing the contribution of agriculture to the national product.

In the long run, if agriculture is to produce enough for food and for biofuels, it needs to be given higher priority on countries' agendas. This should be reflected in integral policies that take into account the heterogeneity and diversity of the region. In this package of integral policies, the policy for the

18 This is due to the fact that agricultural income is the least elastic of all economic activities.

agricultural sector should be designed to generate conditions conducive to the development of all agriculture, including small- and medium-scale agriculture, which should be granted better access to public or social goods and support services, according to its needs. This is the only way to boost the contribution of these small and medium-sized farmers, who have found their development potential limited in the past by lack of access to social goods in agriculture.

To achieve this, policies along the following lines are recommended:

### *Promoting access to R&D on the part of small and medium-sized farming*

The next 50 years will see a rise in the need for crops to feed the population—which will have increased globally from 6 to 9 billion persons within that period—and to provide feed for animals and produce biofuels.

If the region wants to participate actively in the global supply of food crops while at the same time improving the socioeconomic conditions of its rural population, countries should not only improve and increase agricultural investment, but also promote access to the results of research and development. The benefits of the current technological revolution should reach small agricultural producers and guarantee growth, by exceeding the limits on the yield of existing varieties and making maximum use of their genetic potential. At the same time, democratizing access to R&D should also offer opportunities to greatly enhance environmental sustainability, by reducing the use of agrochemicals and maximizing the natural potential of plants to combat pests and diseases, thereby preserving biodiversity.

To achieve this, technological innovations, transfers, and technical assistance will have to be developed, based on the needs of small- and medium-scale producers. To this end, the government, with the support of the private sector, should develop alternative technologies for crops such as tubers, tropical fruits, green vegetables, and other native varieties. These products are very important components in the baskets of tropical countries, and some of them could be replaced by grains and cereals that are dominant in diets

### *Increasing investment in irrigation*

Even though LAC has 24% of the agricultural land in the world, there is a high degree of erosion and degradation which, together with depletion of the most fertile lands and the impact of the green revolution, have considerably reduced the growth rates of crop yields in the region.<sup>19</sup>

Irrigation is an alternative for adaptation to a reduced water supply, and it can also offset the impact of erosion and degradation. Nonetheless, the number of new irrigation projects has decreased and the current systems are relatively inefficient.

## **Box 8:**

### Biotechnologies for small- and medium-scale agriculture

Biotechnology is not confined exclusively to genetic transformation technologies. On the contrary, there is another line of biotechnologies that do not require huge investments (e.g., tissue cultivation, seed cleaning, improvement by molecular markers, etc.), that have proven to have a considerable impact on agricultural productivity. However, LAC countries have hardly participated at all in generating and disseminating these technologies.

A policy to ensure access to and the availability of biotechnologies on national markets needs to be developed. Such a policy should promote the generation of technologies adapted to each ecological and productive situation and to different socioeconomic situations, and should include a legal framework to regulate the activity.

<sup>19</sup> *The rate of growth in per-hectare yields of grains and oilseeds declined by 2% a year from 1970 to 1990, and by 1.1% from 1990 to 2007, and USDA estimates a 0.8% decline for the 2009-2017 period (Banse, Nowicki y Meijl, 2008).*



To date, improvements in water supply and sanitation infrastructure, water resource management, and development of irrigation and drainage continue to be inadequate and major shortcomings persist in management of water for agriculture, including irrigation.

In order to take advantage of the agro-ecological potential of LAC, it is essential to manage water resources with heavy investments in infrastructure, institutions, and management capacity, which is extremely weak in developing countries. Moreover, water resource management projects need to be formulated and implemented in a way that meets the needs of small- and medium-scale agriculture, which has a great potential to increase agricultural yield, but lacks its own funds or financing capacity to make the required investments in irrigation and drainage.

#### *Solutions for adaptation to the effects of climate change and other natural risks*

The increase in environmental risks affects all agricultural producers in the region. However, since many of the small- and medium-scale farms in the tropical belt of LAC are on extremely environmentally vulnerable lands and do not have the resources to carry out projects to mitigate the effects of climate change and natural risks on their own, it is critical for governments to implement urgent comprehensive measures for adaptation of these lands to climate change.

Efforts are needed to boost agricultural research to facilitate the adaptation of these countries to climate change. This research should include the development of varieties resistant to drought and heat stress, and development of technologies for flood zones. Locally, drainage and irrigation techniques are needed to manage excess rainfall and to return flooded lands to production.

Research should also be undertaken on changes in farmland management, such as conservation tillage, agroforestry, and rehabilitation of degraded lands, among others. In addition, small- and medium-scale



The importance of irrigation technology is clear, since the crop yields that can be obtained with irrigation are more than double those obtained by dry-farming (FAO, 2003).

farmers should have mitigation plans that reduce both the risk and the probability of crop losses in the wake of natural disasters (for example, insurance, early warning systems, or improved forecasting capacity). In the most extreme cases, some agricultural activities on land with high environmental risks may have to be relocated.

#### *Exploiting the potential in production of biofuel crops*

The revitalization of the global economy and recovery of oil prices will entail increased demand for agricultural raw materials for production of biofuels. The role played by LAC in this global expansion in biofuel production will depend on the availability of farm land, capital, financing, technology, management capacity, the size of the domestic market, and development of a global biofuel market.

According to FAO and ECLAC studies (e.g., FAO, 2000; Razo et al, 2007a y 2007b), LAC countries with the greatest potential for expanding area under cultivation are in the Andean and Southern Cone regions (Peru, Venezuela, Colombia, Bolivia, Argentina, and Brazil). However, this does not necessarily mean that these countries have potential for biofuel production (Gazzoni, 2008). To confirm their comparative advantages for biofuel production, the countries must: a) guarantee legal conditions governing compliance with contracts and the free flow of capital, with a view to directing international investment flows to financing biofuel production; b) promote multilateral technical cooperation and establish links with research institutes and/or universities



that promote development of technology for both the production and processing of raw materials; c) strengthen management of businesses and decision-makers in the area of biofuels, to take advantage of lessons learned from successful processes around the world; d) promote the growth of domestic biofuel markets, to ensure the economic sustainability of the activity; and e) ensure that development of the biofuel industry does not have a negative impact on the food security of vulnerable populations.

### ***Integrating small- and medium-scale agriculture into agrifood chains***

In LAC, there is a segment of small- and medium-scale farmers that sustainably develop natural resources with agrarian potential, have sufficient agricultural income to cover their basic needs and reinvest in their productive units, and have greater access to technological innovations. However, despite the fact that they have a great potential for commercial agriculture, and the possibility not only of reducing the adverse effects of the economic crisis on the rural sector, but also of accelerating the economic and social development of the region, they have limitations and have not been successful in integrating not only in international agroindustrial chains but also in increasingly demanding national markets. These limitations are related to the availability of and access to basic agricultural support services, and they have prevented them from complying with purchase requirements of supermarkets and major processors, such as quality and safety standards, container and packaging standards, costs, volumes, consistency, payment practices, etc.).

Like the rest of the business sector in the region, agriculture requires infrastructure development to improve links and transit times between national and international markets, better access to financial capital and risk coverage instruments (development banking, incubation centers for agribusinesses, guarantees, crop insurance, etc.), as well as the efficient support of export promoting institutions.

The government and private enterprise must also join forces to manage technological innovations, in consideration of the needs of this agricultural

sector with competitive capacity. This effort should include formulating and implementing agricultural health standards and procedures to facilitate compliance with international standards, promoting the modernization of agribusinesses, boosting the development and modernization of domestic markets, promoting related services to facilitate value-added in the chain and/or integration into consolidated agroindustrial chains, and generating information services for decision-makers.

The creation of these collective goods and support services to enhance the competitiveness of small and medium-scale agriculture will lead to an increase in the local food supply, generate attractive jobs in rural areas, increase the demand for related nonagricultural services, and boost development of new rural enterprises.

### ***Small- and medium-scale agriculture, rural businesses, traditional technologies, and food security***

The role of small and medium scale farming with scarce assets needs to be strengthened by creating rural businesses, reassessing the value of traditional technology, and improving food security.

Unlike small and medium scale farming with a commercial potential, the vast majority of small and medium-sized agricultural enterprises in the region faces serious limitations in its access to productive assets and in its management capacity, among other things. Even though it has low crop yields in comparison with commercial agriculture, and in most cases it does not have the capacity on its own to meet the requirements of international agroindustrial chains, small- and medium-scale farming fulfills an important function by ensuring access to and supplies of food for the rural population. Moreover, it plays a critical role in substituting for food imports and in generating rural income, especially for the poorest sectors.

Policy recommendations for this type of farming depend primarily on its access to productive land and on hiring labor.

*Small and medium scale agriculture with some available productive land and the possibility of hiring labor outside the family* has the potential to engage in the intensive production of higher-value differentiated goods (market niches), that do not require large economies of scale to produce. According to Schejtman (2008), in all the successful cases studied in the region, the common denominator that determined the ability of this type of agriculture to occupy market niches had to do with development of new institutional arrangements, such as hiring systems, quality standards, rules of conduct that emphasized responsibility in meeting commitments, and the performance of rural organizations.

The experience of Spain and Portugal in forming family farming “clusters” shows the importance of promoting an association between small and medium-sized producers (associative enterprises of small farmers), as a way of increasing production volume for the market, managing market information for decision making, increasing trading margins in crop sales, improving prices in purchases of inputs and machinery, and generally improving their capacity to integrate into local agroindustrial chains. In addition to associations, the forming of clusters with the participation of family farmers requires the government to implement support policies to develop and modernize domestic markets and promote rural agroindustries.

On the production front, the yield of traditional or native crops must be substantially improved, through the use of basic biotechnologies, such as micropropagation of plant material, in vitro reproduction, molecular markers, seed cleaning, and the like. This would make it possible to obtain higher production yields from the limited farm land available.

*Small and medium scale agriculture with minimal land and no possibility of hiring labor:* The possibility of integrating into value chains are very slight, and in most cases are reduced to the sale of crop surplus on local markets, although cases have been documented where, with support, they have managed to export “native” products to foreign cities where migrants from these territories have settled (ethnic trade).

In view of their potential in food production, both for their own consumption and to sell on local markets, as well as their potential to generate rural employment (self-employment) and their importance as a “reducer” of rural poverty, it is important for these farmers without access to sufficient productive assets to be targeted by comprehensive policies that go beyond sectoral agricultural policies. In addition to improving their agricultural production capacity, this group of small farmers needs policies that will enable them to have greater access to productive resources (land, water, financing, technical assistance, training, etc.) and social resources (health, housing, basic services, and education).

In the short run, policies must first be designed and implemented to limit the negative effects of the economic crisis on these small subsistence farmers, which, if it lasts, could increase their levels of poverty, malnutrition, and unemployment. To this end, activities to protect the food and nutritional security of the most vulnerable populations need to be developed and implemented.

At the same time, with a view to improving marketing channels between agricultural producers and end consumers, the role of local markets should be strengthened as spaces for trade (local fairs where goods are sold and traded, local markets, etc.), while at the same time new circuits for placement of surplus farm crops should be sought.

In order to boost the value of their products and their technology, small and medium-scale agriculture should be targeted in government product diversification programs that recover the use of traditional technology, promote agrotourism and other rural amenities, and encourage the consumption of traditional foods (such as potatoes, quinoa, etc.).

## ● Conclusion ●

The events of 2007 and 2008 had differentiated effects on agriculture in LAC, as Southern Cone countries saw the prices of their agricultural exports

increase, while the rest of the region experienced a decline in their agricultural terms of trade.

Although it is true that the global economic recession could have a more severe effect on agricultural exports from the tropical belt, the revitalization of the global economy will once again boost demand for farm products exported by LAC. However, this is no guarantee that the earning power of agricultural producers will increase. The rise in international commodity prices may not be reflected in the prices paid to the producer, because of problems involving transmission of international prices to local market and, the heavy reliance on imports in the domestic supply of fertilizers will exacerbate the situation by increasing production costs.

The region could benefit from an expansion in the global demand for food, once economies have recovered from the recession. But, if LAC wants to develop its potential to produce food and biofuels, and contribute to the goals of reducing and mitigating climate change, it must adopt comprehensive policies that take into account the region's heterogeneity and diversity. In this context, agricultural sector policy should not only provide collective and social goods and support services to increase the competitive advantage of commercial agriculture, but it should also promote the inclusion and contribution of small and medium-scale farming with scarce assets, as it fulfills a key role today in agricultural production and sectoral employment in LAC.



## Livestock

There are opportunities for Latin America's livestock industry to grow, but not at the cost of the environment.<sup>20</sup>



### FACTS

- The livestock sector contributes 45% of the gross domestic product from agriculture in Latin America and the Caribbean with an annual value of US\$79 billion and represents 13% of total livestock production in the world. The sector has grown close to 4% annually in recent years, doubling the global average of 2%.
- Livestock includes cattle, pigs, poultry, sheep and other farm animals. Beef and milk production is the most important in terms of value, accounting for 62% of total regional livestock production. Poultry production (meat and egg) has also grown in the last decade, and now accounts for 30% of the overall livestock production value, led by Brazil and Mexico which are among the world's biggest poultry meat and egg producers, respectively. In third place is pork production with 7%.
- South America is the leading exporter of beef in the world, accounting for 43% of total world beef exports in 2008 led by Brazil (56.1% of the region's beef exports in 2008), followed by Argentina and Uruguay with 11.7% each, Paraguay with 8.5% and Colombia with 5%. Altogether, those countries account for 93% of total beef exports from Latin America.
- The main world importers of beef are the United States and Russia, with China growing strongly. Latin America and the Caribbean accounts for 20% of world imports led by Mexico, Venezuela, Chile and Brazil.
- As for milk exports, Latin America and the Caribbean accounted for just 4.7% of world exports in 2006 but exports from the region are growing ahead of world exports. Argentina leads this growth with 56% of regional exports, followed by Uruguay with 18% (2006).
- European countries are the main world importers of dairy products while Latin America and the Caribbean accounts for 6% of world imports led by Mexico, Brazil and Venezuela.
- The demand for beef products is growing 2.5% annually in Latin America compared to 0.5% in developed countries. The average Latin American household spends 19% of its budget on meat and dairy products.
- Land degradation and deforestation is widespread in the region due to 'extensive' cattle farming, which is the predominant system in Latin America, as well as soy bean production in sensitive areas, with huge swathes of forest cleared for those purposes. The livestock sector is the main sector responsible for methane gas emissions, which contribute to global warming.
- Diseases such as foot and mouth, rabies and new world screwworm are a constant threat to the livestock industry causing millions of dollars in economic losses. For example, outbreaks of foot and mouth disease in Argentina and Brazil in 2005 and 2006 resulted in economic losses over US\$10 billion. Annual direct and indirect losses in the region from cattle rabies are US\$44 million. Moreover, a 2006 IDB simulation of a potential avian flu outbreak in the region estimates it would cost US\$1.6 billion.
- Zoonotic diseases, transferable from animals to humans, pose a threat to human health. The alarming increase in the number of such diseases, including A H1N1 flu recently, is of global concern. Some 61% of contagious diseases come from animals and, of these, 75% are considered emerging diseases.

<sup>20</sup> Given the limited scope of this report, this chapter focuses on beef and dairy production, although some policy options apply to livestock production in general.

- **Recent Trends**

*Between growth and environmental threats*

With its large areas of pastureland, mild climate and sound use of inputs including foods (grain, soybean) and fertilizers, Latin America has all the natural ingredients to be a major livestock producer.

In fact, the region is the world's leading exporter of beef and, given world demand projections, exports

are expected to continue rising in coming years creating opportunities for local producers to sell to new markets and expand market share.

Economic growth and higher incomes are also driving up domestic demand for beef and other livestock products. However, the continuing economic crisis is expected to reduce world demand for beef as consumers switch to cheaper alternatives like chicken or pork, which could have an impact on production in the long-term.

Meanwhile, there are serious concerns about the impact of livestock production on the environment including deforestation, land degradation, loss of biodiversity and greenhouse gas emissions. Cattle production has huge environmental costs that are not often factored into the price of steak sold in North American or European supermarkets.

In North America, the common practice of 'intensive' cattle and dairy farming involves confining animals into feedlots, and feeding them corn, soybean or other grains. This type of farming is intensive in the usage of fertilizers and additives, often polluting the surrounding soil and waterways with animal waste and chemical run-off.

In LAC, animals eat healthier and live more natural lives but 'extensive' farming, as the name suggests, requires large areas of land for animals to graze. As a result, the number of cattle produced in the region per unit of land is very low – an average 0.7 animals per hectare – and could get lower if land degradation continues unchecked.

Small producers account for more than 60% of the total production of meat products in LAC including cattle, poultry and pigs while production of other animals including rabbits, goats, sheep, South American camelidae and guinea pigs is also an important source of food and employment in many rural communities. However, family farmers and small producers are more vulnerable to climate change than commercial producers since they are usually forced to graze their animals on marginal land where environmental conditions including water supplies and pasture quality can be precarious.

## **Box 9:** Livestock and natural resources

An estimated 70% of pasture in the region is estimated to be in the process of moderate to severe degradation, which is reflected in the low production of meat per hectare and low economic profitability. Moreover, faced with falling productivity on existing lands, cattle ranchers could resort to clearing more hectares of forest.

While developed countries in North America and Europe have already cleared large areas of their forests, LAC is in the process of catching up. In LAC, changes in land use including deforestation account for 46% of greenhouse gas emissions, compared to 18% in developed countries.

In addition to deforestation, cattle production contributes to climate change through methane emissions. The Latin American model of extensive production is particularly inefficient in terms of carbon emissions per unit of product. In fact, the agriculture-livestock sector is the second biggest contributor of greenhouse gas emissions after the power generation sector in most countries, according to the World Bank's (2008) climate change report.

Climate change also has a negative impact on livestock production; for example, it facilitates the spread of emerging diseases and, due to a reduction in rainfall in some areas, severe droughts occur and the production of pastures and crops needed to feed animals declines.

Small livestock producers also tend to be more exposed than commercial ranches to the volatility of input costs and international food prices. For example, the recent increase in input prices compared to meat prices has reduced the comparative advantage of livestock production. Between 2004 and 2008, while average prices of beef, pork and poultry meat varied by 54%, -9% and 31% respectively, inputs costs grew by 380% for beef (mainly pasture fertilizers) and more than 85% for pork and poultry feeds.

### *Increased risk of disease for small producers*

Government-imposed sanitary and trade restrictions have squeezed cash-strapped small producers that are forced to comply with international norms in this regard.

The spread of diseases is a major threat to small producers unable to afford veterinary attention or, in many cases, to access public health services that tend to be precarious in rural areas. In South America, foot and mouth disease has had the greatest economic impact on the cattle and pork industries. It was eliminated from North America in the 1950s, but not in South America where the disease is still present. Chile is the only country in the region free of the disease without vaccination; Uruguay is free with vaccination while Argentina, Brazil, Colombia and Peru have free-areas with and without vaccination. Finally, the disease is endemic in Ecuador and Venezuela, which have high rates of annual outbreaks.

Bovine spongiform encephalopathy (BSE), or mad cow disease, has also caused global concern because of its economic and commercial impact (US\$5 billion in North America) as well as its potential to be passed from animals to humans. This disease is not found in LAC yet, but it could arrive with infected animals or animal products. Prevention is costly and requires coordination along the whole cattle production chain. FAO has provided technical support for veterinary services within the region since 2002 to help prevent the disease.

Finally, the Highly Pathogenic Avian Influenza (HPAI) H5N1 strain of 'avian flu' has not reached LAC yet, but even so outbreaks in Asia have increased monitoring of domesticated and wild birds in the region. Both poultry and pork sales have been affected by the recent outbreaks of bird and A H1N1, wrongly named swine flu, seriously affecting these sectors.

### ● **Livestock outlook**

#### *Increased efficiency or productivity is required to increase sustainable production*

The outlook for livestock production in LAC is promising due to the rising demand and prices of animal products worldwide, but the challenge in the future is how to increase productivity while reducing greenhouse gas emissions and deforestation.

Although developed countries still consume far more meat per capita than in the rest of the world, emerging countries are expected to drive future world demand growth for meat in the coming decade. Indeed, as incomes rise, China is expected to become ravenous for beef. This country represents a huge market: one kilogram of meat consumption per capita in China is equivalent to Canada's current annual production.

It's not yet clear how long it will take countries to recover from the economic crisis but meat prices are expected to recover soon. Although agriculture prices have fallen due to the lower oil price and demand for beef as consumers substitute cheaper types of meat such as poultry and pork, prices are not expected to fall below their 2005 levels. Moreover, once demand recovers, the price of beef is expected to rise 50% from its current level by 2017 (OECD-FAO, 2009).

In the long-term, rising prices for meat should persuade governments and producers in the region to increase investment in livestock technology and innovation. But given environmental concerns and stricter regulations, producers have to figure out how to increase productivity per hectare without clearing more forests or degrading existing pasture.



## Box 10: Markets will demand carbon footprints

Complying with international emissions targets is not the only reason for producers to reduce emissions. In the near future, it is expected that international markets will demand to know the carbon footprint of all meat and dairy products, and consumers will prefer those products with the smallest footprint, which means companies will need to reduce emissions per unit of product to remain competitive. Those producers able to reduce their carbon emissions will likely gain a larger market share so investments aimed at reducing emissions are likely to be very profitable in the long-run.

There are opportunities for the livestock industry to grow, but not at the cost of the environment.

Brazil currently dominates exports from the region and will likely increase its production in the next decade, probably by recovering degraded soils and intensifying beef production in cleared forest land. With its vast pampas and famous grass-fed beef, Argentina also has potential to increase exports, but government intervention in the form of export taxes makes the outlook there uncertain. Colombia is a relatively new beef exporter in the region, but it is expected to gain market share in the future thanks to its recently obtained status as a Foot and Mouth disease-free country.

Given the extensive farming system practiced in LAC, livestock productivity per hectare is below the world average. But, as demand for exports increase, livestock productivity must improve for Latin America to maintain its market share.

The challenge is to increase production without using more land, especially because competition with biofuel and basic grains is strong in countries

like Brazil and Argentina. Moreover, continued deforestation would only increase greenhouse gas emissions, potentially becoming a trade barrier for export if importers start to discriminate based on a product's carbon footprint, which is already happening in some countries.

The technology to increase productivity without degrading the land exists but the adoption rate is low in LAC because new technology, usually developed in the Northern Hemisphere, must be imported and it must be adapted to local conditions. In many countries, policies do not exist to facilitate investment.

On the bright side, the economic crisis could drive an increase in productivity through the more efficient use of resources. With less investment due to the crisis, producers are forced to maintain production using fewer inputs which means that when the global economy and demand eventually recover they will be better positioned to supply more meat using sustainable methods.

Small-scale livestock production, which is an important source of employment and food in many rural areas, is more vulnerable to lower prices and higher input costs than larger producers. Small-scale farming also faces competition from large commercial farms, which usually have better access to more markets, as well as better biosafety management capacity and stricter regulation of animal production practices based on international norms.

Small producers should be better prepared to manage these pressures but they need government and private sector support to become more productive and obtain better access to markets. Without state programs, small producers could either be forced out of business, causing unemployment and potential food shortages in rural and vulnerable urban areas, or they could be forced to increase production at the cost of more deforestation and land degradation. Small producers need financial incentives and technical support to survive during the crisis and increase productivity in an environmentally and socially sustainable way going forward.

Sustainability is important given the mounting pressure on emerging countries and livestock producers to reduce their greenhouse gas emissions. Since access to animal products from developing countries could be affected by new global environmental agreements, it is important that they begin to prepare now for this future scenario.

Governments can also help producers reduce emissions as a way of strengthening their negotiating position over carbon emissions. The livestock sector, through methane emissions and deforestation, is the second major contributor to climate change after the energy sector in most countries of the region. But reducing methane emissions and increasing production without deforestation requires financial incentives and sustainable public policies.

Protecting livestock from trans-boundary (cross-border) animal diseases depends very much on public investment to help producers. This can be achieved through better coordination between international animal health organizations and national veterinary services to stop diseases such as foot and mouth disease from spreading between countries, causing a potential sanitary problem and millions of dollars in economic losses.

International coordination could also help to control possible outbreaks of new emerging diseases like the avian flu or A H1N1 flu, which could arrive anytime and, if not controlled, could spread quickly within the region due to lax border controls in some areas. Governments should improve veterinary services especially for small producers that may not be able to afford private veterinary services in isolated areas.

- **Policy recommendations**

*The livestock sector, if properly managed, can contribute to the environmental and economic sustainability of rural areas*

Latin American countries need an environmentally and socially responsible policy framework for animal production and health to reduce the impact

of livestock production on the environment and improve productivity.

Part of the reason such a framework does not exist is that governments, producers and consumers are ill-informed about interactions between livestock and the environment. In addition, sustainable farming methods take longer to implement than the short-term political vision of most governments allows. In fact, short term political measures to reduce domestic prices or increase domestic food supplies, such as taxes on beef exports in Argentina, could have a detrimental effect on the industry in the long-term.

Governments must accept that sustainable livestock policies could have a political cost in the short term because consumers may end up paying more for meat. That does not mean governments should give up, rather they should work to make consumers and producers understand the connection between livestock production and the environment so they value meat that is produced in a sustainable way.

It's a fact that the only contact many inhabitants of large LAC cities have with livestock is in the meat section of their local supermarket. Since people are alienated from their sources of food in general, there is less awareness and governments tend to neglect the needs of agriculture and livestock producers. In addition, the remoteness of livestock production in many areas, such as the Amazon basin or other poor rural areas in the region, makes it difficult, though not impossible, for governments to enforce regulations and health standards in these areas.

In developed countries there is a recent surge in interest in organic farming and consumers are demanding food that is produced with lower social and environmental impacts. This means that if Latin America wants to continue leading the world in beef exports in coming years, policies are needed that help producers increase productivity while at the same time lowering emissions, using available land more efficiently and improving safety and quality of food products.

Other countries have already shown it is possible to increase productivity while reducing negative

environmental impacts. New Zealand, for example, has limited land area for farming but uses sustainable intensive pasture management techniques and has increased animal density to an average of three head of cattle per hectare, more than three times as many as LAC (0.7 heads/hectare) by the strategic and sustainable use of new technology, fertilizers and improved feeds. To follow this example, producers in LAC need stronger institutions, improved access to new technology, more funding for research, and sustainable rural development policies.

### ***More Investment needed in technology, research and development***

Governments can help livestock producers by investing in research and development through universities and public institutions. The technology for increasing productivity exists, but it must be adapted to local environmental conditions to be used throughout LAC. To achieve this, public and private resources should be used for technology development and technical assistance programs to teach farmers how to use the technology most efficiently at a local level.

In the past, investment in agriculture has focused on subsidies in rural areas but this makes farmers dependent on government assistance. In addition to subsidies, public investment should include low-interest loans and improved access to credit aimed at small producers as well as help entering new markets.

Governments could also help improve productivity and reduce environmental impacts simultaneously by paying producers for environmental services such as carbon fixation, restoring degraded land, water conservation and biodiversity.

Carbon fixation projects, which help offset carbon emissions from livestock production, can include planting trees on pasture land and planting types of grass that capture more carbon and feed more animals. In this way, countries can reduce emissions, comply with possible future emissions limits and even participate in the international carbon market, for example through certifying carbon fixation projects

as Clean Development Mechanism (CDM) projects able to sell carbon credits to foreign companies.

Universities and research institutions in LAC and other parts of the world have developed a range of technologies to recover land degraded by livestock grazing and to facilitate the sustainable intensification of cattle farming using integrated agriculture-livestock-forestry systems. Latin American governments and universities should strive to increase international cooperation in order to facilitate the transfer of knowledge and expertise in this area.

As regards the use of water, artificial irrigation is not common in LAC, over 90% of pastureland is rain fed, but rainwater can be used more efficiently. This can include building reservoirs to store water, installing drains to prevent floods, developing grasses and forage that are more tolerant to droughts, and using seasonal pasture land management techniques suitable to specific areas.

Paying farmers to increase biodiversity including flora, fauna (birth) and micro fauna (soil microorganism) would also help prevent deforestation and soil degradation, while diversifying the number of animal products for export or sale in the domestic market and generating new sources of income through agri-tourism.

Universities can also play an important role in livestock productivity through the development of genetically modified or enhanced animal resources. Genetically enhanced crops, for example, can reduce the exposure of producers to climate change and limit the environmental impacts of the livestock sector.

Governments should support universities by updating regulations and legislation in line with international agreements on the use of genetically modified food and agriculture resources.

### ***Livestock for food security and poverty reduction***

Family and small-scale livestock production are important for food security, poverty reduction and

rural development in LAC. Small producers are especially important in non-exporting countries where they supply most of the domestic demand for meat and dairy products.

However, although meat consumption in the region is growing, it is still much lower than in developed countries. The participation of meat in the protein intake of low-income families in developing countries is just 22% compared to 60% in developed countries.

Public policies aimed at improving nutrition and food security should focus on small livestock producers to help them increase productivity and incomes and allow them to continue supplying a variety of animal products for consumption in vulnerable urban and rural communities.

In the short term, small-scale farmers need programs to help them survive the economic crisis; otherwise many of them may be forced out of business taking jobs and food supplies with them.

In the longer term, small producers need access to markets, which are usually dominated by big companies. This can be accomplished by facilitating partnerships or the creation of clusters of producers to increase their production capacity and negotiating power. Small producers also need assistance to access niche markets in developed countries directly rather than through intermediaries, especially niches for gourmet products made from native species.

To access new markets and boost productivity, producers need access to information and technology which they could obtain in exchange for environmental services, as mentioned above.

### *Efforts to coordinate disease control among small producers*

Funding and support for veterinary services is needed to prevent diseases and control outbreaks if they occur. Veterinary services should coordinate with public health services to better prepare for health emergencies and coordinate in the event of outbreaks of diseases such as BSE, new world



## **Box 11:**

### International cooperation to face the Avian Influenza (HPAI) H5N1 epidemic

At the time this report was published, the American continent was free from HPAI-H5N1. However, since its first outbreak at the end of 2003, the disease has spread quickly to more than 60 countries in Asia, the Near East, Europe and Africa, accompanied by mounting concern as 262 people have died and direct losses are close to US\$10 billion in Asia alone. Faced with this threat, several Latin American countries have asked for FAO emergency technical assistance to prevent possible outbreaks of the disease. In May 2006, the FAO answered their demands by approving four regional projects involving all 33 countries in the region. The projects strengthened veterinary services through direct technical assistance, laboratory equipment and staff training. The training approach was adopted to benefit as many public and private veterinary staff as possible at the country level.

The FAO's response has been well coordinated and integrated with other international agencies such as OIE, PAHO, OIRSA and IICA. The benefits of the training process were demonstrated during the recent influenza A H1N1 pandemic as veterinary services were able to monitor and control the transfer of the disease from swine to humans.

screwworm and avian flu, which can be transferred from animals to humans.

Large commercial ranchers also have an interest in ensuring that small producers have access to veterinary services because one infected animal can infect hundreds of others and affect the whole industry if not detected in time.

Better coordination is also needed at a regional level in the Southern Cone, the Andean countries, Central America and the Caribbean, to control animal diseases and prevent them spreading to other regions. Although regional agreements exist, a lack of political will means they are often not implemented properly.

International cooperation can also play an important role in the sustainable management of the livestock industry. International agreements exist on biodiversity, genetic resources, animal health, climate change, water and desertification amongst others but these need to be implemented at a local level.

International organizations can help by facilitating cooperation between countries and the exchange of information between local research and technology institutions. FAO, for example, has developed the technical and operating capacity to support governments in making decisions about the major challenges facing the livestock sector with an emphasis on developing countries.

## ● **Conclusion**

The growth of Latin America's livestock industry is based on exports, but domestic demand for animal products is also expected to rise. The small-scale production of livestock provides jobs and food security to millions in the region, but it needs to be strengthened. The livestock industry is unsustainable in the long-term if productivity cannot be increased without negative environmental consequences.

To increase productivity in a sustainable way, producers need policies that reward sustainable land use, water conservation, biodiversity and emissions reductions as well as better animal health to prevent zoonoses.

Soft loans are required to let commercial producers recover degraded land, create integrated sustainable agro-forestry-livestock systems and improve productivity. Small producers, in particular, need access to financing and technologies that help them improve productivity on existing land without being obliged to clear new land for grazing.

These policies could lay the groundwork for a sustainable and profitable livestock industry in the long-term but they require political will, strong institutions and cooperation between ministries, research institutions, non-governmental organizations and other stakeholders.

LAC's livestock industry has an opportunity to grow to meet world demand, but increasing productivity should not be at the cost of the environment. The technology and skills exist to do this, but governments must invest more in the right areas and implement integrated agriculture-environment-rural development policies.



## Capture fishing and aquaculture

The region presents comparative advantages in aquaculture and the sector has the potential to grow more rapidly than the global average, but the industry faces important challenges<sup>21</sup>.



### FACTS

- Protein from fish and aquaculture products represents almost 20% of the total animal protein consumed by some 2.6 billion people worldwide.
- In Latin America the annual per capita supply of fish products averaged 13.6kg in 2005, varying from less than 1kg in the Bolivian plateau to more than 20kg in some parts of the Caribbean. This is slightly lower than the average global annual fish supply of 16.4 kg per capita (FAO, 2008).
- Production and export is led by industrial fishing and aquaculture entities owned by private consortia. These organizations rely on integrated production processes and well established commercialization chains.
- In the last 15 years, the proportion of global fish stocks overexploited or at their maximum production has remained stable. Of total fish production worldwide, 75% is destined for human consumption while the remaining 25% has other uses not directly related to consumption such as fertilizer or fishmeal.
- As far as capture fisheries are concerned, Latin America has two countries (Peru and Chile) among the top ten producing countries of the world, with 7% and 4.2% of the global total fish production by volume respectively. The anchovy and sardine fisheries are the main contributors in these two countries.
- Small-scale fishing continues to contribute to rural development as a source of food, jobs and income. There are around 2 million small-scale fishers in Latin America with annual estimated production of 2.5 million tons valued at US\$3 billion.
- On a global scale, aquaculture continues to be the fastest growing food sector with annual growth averaging 8.8% since 1970. By comparison, capture fisheries production (marine and freshwater) in the same period grew 1.2% on average (FAO, 2008).
- Aquaculture in Latin America grew an average 22% annually between 1970 and 2006, making it the region with the highest growth worldwide (though it only contributes 3% of global production). Mexico and Guatemala are in the top 10 list of countries with highest growth in aquaculture, but 80% of the production in the region comes from Chile, Brazil Mexico and Ecuador mainly through aquaculture of salmon, shrimp and tilapia.
- Salmon has overtaken shrimp as the top aquaculture species in Latin America as a result of the rapid growth in salmon production in Chile. However, Chilean salmon farms have been hit by severe disease outbreaks in the last few years, which are expected to cause a reduction in production between 30% and 50% in 2008 and 2009.

<sup>21</sup> *The lack of statistics about fishing and aquaculture in many Latin American countries makes it difficult to generalize across the region, but some trends can be seen emerging.*



- **Recent trends**

*Commercial aquaculture has high dynamism but negative environmental impact*

Capture fisheries have been an important source of food and income in rural areas of LAC since ancient times and they are closely linked to rural development. Aquaculture, in its modern concept, was first introduced in the region in the late 1960s aimed at providing rural communities with high quality protein at an affordable price through household fishponds. Since then, through the adoption of a business vision, export oriented aquaculture has expanded quickly and has become an important source of income in many countries. Capture fishing and aquaculture generally contribute positively to rural development, but in some cases the impact has not been as good as expected.

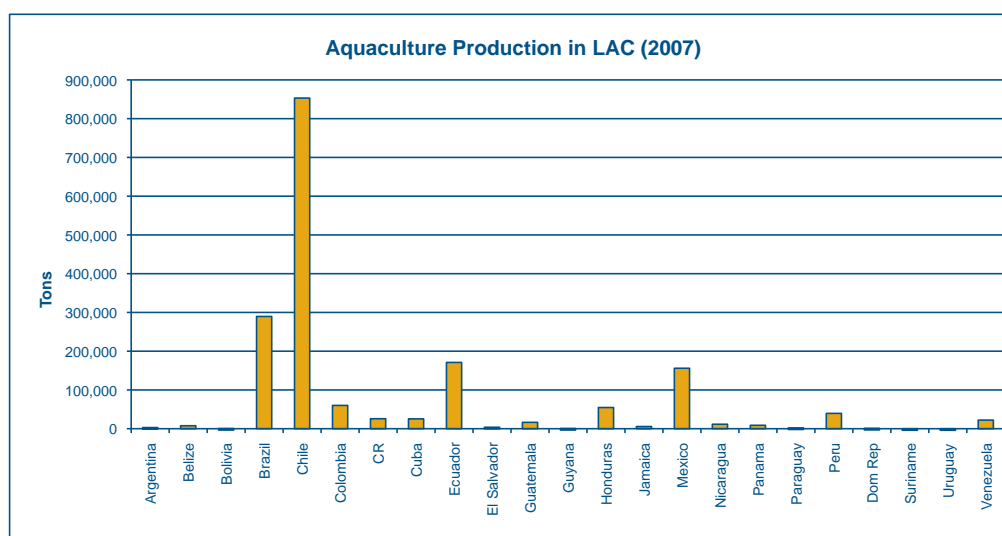
Capture fishing activities include small-scale (artisanal) ocean fishing, freshwater fishing and commercial (industrial) ocean fishing. Aquaculture activities are basically divided into small-scale aquaculture (usually in freshwater ponds) and commercial aquaculture (usually in closed water

systems, raceways or open water cages in lakes, reservoirs or the ocean).

Traditional artisanal fisheries have a direct impact on rural development by employing fishers and feeding their families. But the arrival of commercial aquaculture operations in the last 30 years has had an important impact on rural development through increasing employment and technology transfer in rural communities. However, without corporate social responsibility, industrial aquaculture operations can have little or no impact on nearby rural communities, because capital intensive fish factories employ few local workers, import seed and feed and export their fish to other countries, often giving little back to the community.

During the last few years, commercial aquaculture has increased in Chile, Brazil, Ecuador and Mexico, which specialize in salmon, shrimp and tilapia (see graph). Those products are cultivated using technologies that allow farmers to intensify production in a more efficient way and, if responsibly adopted, have a big potential to contribute to rural development in the Latin American and Caribbean region, given the vast areas with suitable conditions for growing fish products. Many of those areas are

**Figure 3.** Aquaculture production in LAC 2007.



Source: FAO, 2008.

not suitable for agriculture. Therefore aquaculture allows the enhancement of production capacity in marginal areas with low or very low agricultural productivity and employment opportunities.

Some positive impacts of aquaculture in the region have included settlement in rural areas, limiting net migration to urban areas or other countries, formal employment and higher incomes as well as better education and training for local workers and their families. But there is a down side. Large-scale aquaculture operations are dependent on export markets, increasing employment uncertainty during low demand or low price periods, and are not sustainable without responsible management of environmental risks.

The increase in the intensity of aquaculture methods in some countries like Chile and Ecuador has surpassed the maximum biological capacity of ecosystems and the tolerance of some organisms to living in high density. This has resulted in disease outbreaks with negative economic and environmental consequences. Both countries have recently suffered from outbreaks of viral infections amongst farmed salmon and shrimp respectively. In Chile, for example, a disease outbreak affecting salmon farms produced a very high mortality rate, forcing companies to let go thousands of workers. This outbreak has hurt aquaculture companies at the same time as they are facing lower demand in export markets as a result of the financial crisis.

***The small-scale fisheries sector is growing, but lacks political and institutional support***

Small-scale fisheries are an important source of income for many rural communities but the public policies aimed at supporting these activities tend to be scarce, obsolete or ineffective.

During the past decade, fishers in LAC have increased efficiency and productivity. In some places fishers have organized into clusters or cooperatives to manage the processing, packaging and sale of their products. Women are also playing



**Box 12:**

**From Sisal fiber to fishing: An example of how an employment crisis and the resulting migration to coastal areas impacts fishing**

For more than a century the production of sisal fibers in the Yucatan, Mexico, sustained both rural and urban economies of the region. Suddenly, during the 1970s, the introduction of synthetic fibers derived from petroleum, replaced sisal used to make ropes, sacks, carpets and many other goods.

In rural areas of the Yucatan, before the invention and commercialization of synthetic fibers, more than 40% of the available jobs were linked to the sisal production and processing chain. The collapse of the industry caused thousands of rural farmers to lose their livelihoods.

To respond to this crisis, the local government introduced a subsidy for families of farmers who lost their jobs in the sisal plantations. This subsidy was maintained until the early 1990s. Once the subsidies ended, however, hundreds of former agricultural farmers abandoned their hometowns and migrated to coastal areas looking for better opportunities; many of them became improvised fishermen. The problem is that the original population of artisanal fishers was in balance with the available fishing resources of Yucatan's coastal region. Migrant rural farmers put added pressure on fish resources by increasing fishing. This phenomenon indirectly affected the livelihoods of traditional farmers and, at the same time, the income generated by fishing activities for newcomers was not enough to ensure a decent standard of living.

an important role in small-scale fisheries and processing plants, though their role often goes unrecognized by governments. Despite the growth in small-scale fisheries, however, there is a lack of specific legislation for this type of fishing and a low level of compliance with environmental norms.

Policies have generally failed to control the development of sustainable small-scale fisheries with the result that fishing stocks in many

coastal areas have been overexploited, leading to unemployment and poverty when fisheries resources collapse. Furthermore, many coastal communities in Mexico, Ecuador and Brazil have developed rural aquaculture with government support. For many of these communities, exporting shrimp (Mexico, Ecuador) and tilapia (Brazil, Honduras, Costa Rica) has become the main economic activity. However, conflicts between aquaculture and capture fisheries over water use and access to resources in some areas remain unresolved.

### ***Environmental costs are linked to irresponsible aquaculture and fisheries***

Over fishing and lack of regulation can contribute to the depletion of fish resources in coastal areas and inland waters. Economically depressed coastal areas often have suitable conditions for the development of large-scale aquaculture and many countries have designed specific policies to support this kind of scheme to create many jobs quickly, even if they are only temporary. But this kind of aquaculture must be managed in a socially and environmentally responsible manner, to prevent serious environmental, social, economic, and health costs for rural communities.

In terms of the environmental costs, fish feed often contains antibiotics and other drugs that should be regulated in terms of quantity and quality. Excess feed and feces that smother the ocean floor beneath and around net cages can cause significant damage to the natural habitat. The transfer of diseases from farms to the marine environment is also a serious concern.

As for fisheries, there are several capture techniques that are banned or questioned in many countries or at international level. For example, some fishing equipment such as “sweeping nets” severely damages the ocean floor. Such equipment has been banned in many countries, although there is still strong pressure from industrialized fishing companies to continue using them.

### ***Limited access to technologies and markets for small-scale aquaculture***

The development of large-scale aquaculture projects in rural areas has brought technological benefits (e.g. in Chile and Ecuador) by giving workers and their families access to communications technology like the Internet and cellular phones. Other positive impacts of industrial aquaculture and fisheries in rural areas include the education of workers about food safety and hygiene practices used in food processing operations. Workers pass these good hygiene and safety practices on to their families and the wider community.

But new technology is not widely accessible to small-scale farmers who, with limited resources, may be unable to buy inputs, thus maintaining their relatively less competitive position in the sector. Moreover, small-scale producers are often unaware of food safety standards required by export markets or these are too expensive and complicated to implement, which makes it almost impossible for them to enter into high value markets.

## ● **Aquaculture and Fishery Outlook**

### ***Aquaculture in LAC is growing faster than the global average***

LAC’s comparative advantages in terms of fisheries and aquaculture include its vast water and land resources, also available in areas barely suitable for agriculture; climate diversity with conditions suitable for the production of several species and the availability of inputs for the production of relatively inexpensive fishmeal. Given these advantages, aquaculture in LAC should continue to grow at a higher rate than the global average. Growing demand and the tendency of food prices to rise in the long-term should stimulate fisheries activities throughout the region.

But the industry faces a number of challenges including: rising prices for feed and energy, climate

change, overexploitation of fish stocks and lack of access to technology and markets. Governments need to address these challenges to ensure that fisheries activities are sustainable.

In Latin America and the Caribbean, the projected fish consumption by 2015 will be 20% higher than in 2005 (1 – 1.2 million tons more per year) due to population growth and increased per capita consumption, which is expected to rise to 9.2 Kg annually from 8.7 Kg in 2005. The 60% of consumption increase will be due to population growth while the per capita consumption will reach 9.2 Kg from 8.7 Kg in 2005.

A special mention should be made of the opportunities for urban-based aquaculture enterprises to become a particularly dynamic sub-sector, since their proximity to a rapidly growing market could stimulate investments in modern aquaculture. This is particularly true for countries such as Nicaragua, where recent aquaculture development plans are oriented towards stimulating urban aquaculture farms.

***Rising feed prices are a challenge for fish producers, but demand for fish products is growing***

The trend of rising prices for food products globally represents an opportunity but also a challenge for fish producers. Although higher prices and increased demand should stimulate production of fish products, higher prices for energy and feed will increase costs especially for energy-intensive aquaculture and processing operations. Moreover, the high dependency of commercial aquaculture feeds on fishmeal as the main source of protein puts added pressure on the natural fish population providing the raw material. Increased demand for fishmeal also lifts prices and boosts production costs for small-scale producers that may not be able to afford higher prices.

Aquaculture companies have already been hurt by higher feed prices, disease outbreaks and lower demand for exports as a result of the financial crisis. Many of these companies have been forced to lay

off workers to survive. This trend of increasing input prices and production risks will continue in the medium and long-term, driven by uncertainty in the supply of basic grain and other inputs due to the impact of climate change on crops.

On the positive side, higher feed prices are forcing companies to grow more inputs such as grain locally instead of importing feed from abroad, which creates jobs in impoverished rural areas. For example, this is the case with lupin seed mainly grown in Argentina which is sold to feed mills as a partial substitute for fishmeal. The integration of agriculture and aquaculture will likely continue to be a key element for rural development in Latin America and the Caribbean.

Small-scale aquaculture also faces rising costs of feed, as well as more serious problems in the long term, such as: the lack of management skills to make decisions in times of market volatility or production problems; lack of good quality fingerlings; lack of technologies; and stricter global food safety standards that are difficult for them and for artisanal fishers to meet.

Demand for some products has also fallen in recent months due to economic constraints in foreign markets, but global demand is projected to grow in the long-term due to population growth and changing patterns of consumption.

***Productivity of tropical ocean fishing could decrease because of Climate Change***

An important challenge facing the fishing industry globally is climate change. The impact is not limited to LAC and may be positive or negative depending on where fishing activities are and how species react to temperature changes in the ocean. Overall, climate change will result in changes in production, commercialization and transport costs, changes in prices for fishery and aquaculture products, and increased risk of damage to infrastructure, tools and housing. This is particularly relevant to coastal areas and insular countries such as those in the Caribbean.

In terms of physical and biological impacts, climate change is modifying the distribution of marine and freshwater species. In general, warmer-water species will continue to be displaced towards the poles and experience changes in habitat size and productivity.

In a warmed world, ecosystem productivity is likely to decline in lower latitudes (i.e. most tropical and subtropical oceans, seas and lakes for example in Brazil and the Caribbean) and increase in higher latitudes (for example Chile and Argentina). Increased temperatures will also affect fish physiological processes, resulting in both positive and negative effects on fisheries and aquaculture systems.

Fishing-dependent rural communities may also face increased vulnerability in terms of less stable livelihoods, decreases in the availability and/or quality of fish for food, and risks to their own health if, for example, fishing under harsh weather conditions or farther from their home base (FAO, 2009).

### ***Opportunity for biodiversity to open niche markets***

The expansion of the aquaculture sector will continue to be strongly linked to salmon, shrimp and tilapia farming. But there is an opportunity for native species, particularly in the Amazon basin, to obtain a greater market share, provided that their culture technology is fully developed and market niches are created.

### **● Policy recommendations**

#### ***Policies should consider the impact of aquaculture and fisheries on rural development***

Many of the problems with fishing in rural areas stem from a political vision that fails to integrate fishing and aquaculture with other aspects of rural development. Fishing and aquaculture are often seen as separate from their impact on poverty

reduction, job creation and protection of natural resources, all of which must be considered to ensure the long-term sustainability of the industry (see FAO ecosystems approach).

Except for temporary employment, some aquaculture companies contribute little to growth in rural communities and, if not properly regulated or integrated into the territory, they could even have a negative impact. In contrast, some socially-responsible aquaculture and fishing companies are showing how these sectors can contribute to employment, social security and in situ capacity building in rural communities.

Policy options should stimulate the adoption of socially and environmentally responsible codes of conduct, such as the FAO's Code of Conduct for Responsible Fisheries. For this reason, governments must implement policies that protect the environment and rural communities from the impacts of large-scale aquaculture. This should include studying the biological density capacity of aquaculture projects to ensure environmental sustainability.

Good management practices for large-scale aquaculture include adequate site selection (assessing the carrying capacity of a cage site for example, to determine the maximum allowable tonnage of fish to be produced); adequate environmental management of the farm; limiting the use of antibiotics and other drugs; and using non-polluting feeds, among others.

Small-scale fisheries can also be damaging for long-term growth if unregulated, but they have a more direct impact on rural development by providing stable employment and a source of food. The first priority of governments, therefore, should be to protect the livelihoods of fishers and their families from the current economic downturn.

To ensure that small-scale fisheries are sustainable in the long term, programs are needed that give fishers new skills, technology, soft loans, infrastructure and gender balance. It is important that sector specific public policies focus on allowing fishers and their families to be self-sufficient and economic sustainable.



The FAO, for example, has implemented a sustainable aquaculture program in Africa based on experiences in different parts of the world to support the livelihoods of small scale producers, which, if adapted and implemented in LAC, could have an important impact on rural development.

This program, in line with the Millennium Development Goals, is based on recognizing the importance of small-scale aquaculture farms in economic development, social relationships and the environment. The program focuses on skills creation to fight poverty and lead to sustainable development in the long-term while also strengthening health, literacy, education and training.

Aquaculture can readily integrate with traditional agricultural systems in rural areas. Although this is an ancient practice in Asia, it has only recently been adopted by small-scale agricultural farmers in LAC. Integrated aquaculture/agriculture/animal husbandry systems are employed in Mexico and Central America. For example, the production of fowl in fish ponds fertilizes fishponds and water from the ponds is enriched and used for irrigation of agricultural crops, thereby increasing agricultural productivity and local food production.

### *Skills creation vs. dependency*

Rural policies in the past have often been motivated by short-term political needs, leading to quick-fix solutions like cash transfers or subsidies. However, these often make fishers in rural areas dependent on subsidies instead of creating skills and promoting sustainable development.

Policies with a long-term vision should focus on small-scale fisheries in rural areas to stimulate *in situ* capacity building aimed at integrating fishers into food production chains that produce more economic and technological benefits for their communities. Policies are needed to help fishers and aqua culturists become economically independent to ensure sustainability and a commercial focus.

### *Better research and regulation for sustainable development*

Many policy instruments aimed at the sustainable development or management of fisheries and aquaculture are gradually being developed worldwide. These range from the so called 'soft laws' such as '*best management practices codes*' voluntarily adopted by local fishers and farmers, to internationally-adopted regulatory frameworks for the sustainable use of fisheries resources. Countries of the region should carry out a diagnosis of the current state of both their fisheries and aquaculture sectors as a basis for creating national strategies focused on small-scale, resource-scarce, rural fishers and aqua culturists.

Fisheries and aquaculture are often included in general agricultural legal and institutional frameworks. Given the differences in the nature of these economic activities and their complexity, governments should promote the creation of specific legislation and institutional frameworks for the fisheries and aquaculture sectors.

Policy instruments aimed at the full integration of small-scale fishers/farmers in production and value chains are necessary to let this sub-sector achieve self-sufficiency. As a first step, they should be included in national agricultural censuses, strengthening their organization and creating specific programs to link large-scale producers with rural producers.

New technology schemes between fisheries and aquaculture can have positive and negative effects that need careful consideration and strict regulatory frameworks. In the case of aquaculture-based fisheries, for example, tilapia and carp reservoir-based fisheries in Mexico and Cuba use hatchery-reared fingerlings. In this case, the effect is positive as regular replenishment of fish stocks makes the fishery sustainable. On the other hand, fishery-based aquaculture, for example, tuna fish fattening of wild-caught juveniles in ocean cages in Mexico, can have a negative impact on wild stocks if not managed properly. Therefore, efforts must be made to encourage strengthen research and the development of technology that can be applied in



a scientifically controlled and environmentally sustainable manner to the complete production cycle. Aquaculture, if properly managed, does not have to be harmful for the environment and, in the near future, could help to replenish and regenerate species that are in danger of extinction, as is the case already with land animals.

For the analysis and design of strategies for aquaculture in a new county or region, FAO has proposed the ecosystem approach. This approach includes considering the costs and benefits of aquaculture from the environmental, social and economic point of view, to ensure its sustainability.

Agriculture-aquaculture integration is an effective productive system able to positively impact the economy of the rural family, provided it is part of an overall sustainable economic framework. Such integration would enhance agricultural productivity and, at the same time, reduce the environmental impacts with aquaculture waste becoming an agricultural fertilizer rather than a pollutant.

There are also some lessons to be learned from the recent disease outbreaks and stock depletion in the region. Firstly, fisheries and aquaculture activities must be regulated to prevent environmental problems and overexploitation. In countries where regulations exist, they are not always enforced which means environmental problems can become unsustainable and in some cases irreversible. This has a negative impact on rural employment and the environment.

Even if the magnitude of the environmental impact is directly related to the size and intensity of the production centre, the overall effects of many small scale units can have the same effect as a big industrial plant. Aquaculture and capture fishing can provide employment and food in rural areas in the long-term, but governments must implement policies that support sustainable fisheries activities. Policies must not be limited to subsidies in times of crisis, but must increase access to productive assets, skills training and technology.

### ***Globalization opens a gap in competitiveness for rural producers***

In a globalized world in which international markets demand high food safety standards, it is difficult for small-scale producers to comply with these standards because they lack basic resources and knowledge. Adhering to food safety standards can be costly for small companies or individuals, but local institutions can help them obtain quality certifications like HACCP or ISO and implement traceability.

Even with these certifications though, it can be hard for rural producers to compete in export markets that demand low prices and high volumes. One option is to organize into clusters or cooperatives of fishers. This model has been successful in countries like Spain and France and is going to be implemented in Chile, Mexico and Brazil. Clusters can take advantage of economies of scale in production and the cost of inputs such as feed and seed can be reduced by bulk purchases.

### ***Promote exchange of technology and know-how***

Although most of the research and development in fishing and aquaculture technology takes place in the Northern Hemisphere, most of the opportunities for growth in both sectors are in Southern Hemisphere countries. Governments should work to increase North-South cooperation and cooperation among the countries of LAC to share technology and know-how.

In addition, governments and local entrepreneurs should promote the creation of aquaculture and fishing research centers in their own countries to develop local scientific expertise and create business opportunities in the future.

An example of potentially beneficial technology transfer could be the land-based aquaculture systems in artificial ponds or hydroelectric reservoirs, an important source of income and food in Mexico, Cuba and Brazil. This type of aquaculture,

if managed properly (i.e. correct species are selected and biosafety procedures are adopted), is environmental friendly and can be implemented in other LAC countries. Before land-based aquaculture is implemented however, a comprehensive analysis of possible impacts is needed as well as a careful selection of species and production systems.

Finally, workers in fisheries activities need skills training to use and maintain new technology necessary to improve the competitiveness. Governments should promote skills training through the provision of scholarships for students to study abroad in countries where the sector is more advanced as well as bringing foreign experts to local universities and institutions. Governments should make education a priority and a vehicle of development in rural areas.

## • **Conclusion**

Small scale aquaculture and fisheries currently provide employment and food security in the rural areas of many countries in LAC. This happens despite a lack of economic and technological resources, tailored regulatory frameworks able to deal with the new environmental challenges, and policies focused on promoting skills development for producers in rural communities.

To promote the sector's development, governments must help small producers strengthen their competitiveness, technological development and access to food production chains and markets. Only with this kind of public support will producers be able to achieve economic sustainability and self-sufficiency as well as a better quality of life.



# Forestry

## Latin America and the Caribbean's forestry sector stands tall



### FACTS

- **A forest region.** As of 2005, Latin America and the Caribbean (LAC) had an estimated 924 million hectares of forests, representing 46% of its total land area. However, this is the region of the world with the worst loss of forest cover.
- **GDP contribution.** The contribution of forests as a percentage of GDP is notoriously difficult to calculate but forestry in South America contributes around 1.9% of GDP, one of the highest rates in the world.
- **Forest livelihood.** Forests are fundamental for rural development and, in LAC, have great potential to improve rural livelihoods and reduce poverty.

### Recent trends

#### *Forestry's economic contribution is underestimated*

The economic contribution of the forestry sector to the regional economy is still a matter of debate. For this reason, the FAO's Forest Commission for LAC launched a regional study to better understand the overall impact of the forestry sector's contribution to Gross Domestic Product (GDP). According to FAO (2009), the output of LAC's forest sector - including forestry, logging, wood products, pulp and paper - reached US\$40.2 billion in 2006, accounting for 1.9% of regional GDP as compared to a world average of 1.0%. In South America alone, the figure reached 2.1%, the highest for any region except West Africa (2.2%).

The report estimates that, in 2006, the forestry sector accounted for 0.7% of total employment in LAC (some 1.5 million jobs). In Brazil and Chile, the figure reached 1.2%, while the highest in the region are Belize (2.6%), Suriname (2.2%) and Guyana (1.9%). LAC's forests are key international suppliers of wood products. With total forestry exports of US\$ 16 billion in 2005, and US\$ 23 billion in 2007 the region accounted for 13% of world output of industrial round wood, 10% of sawn wood and 8% of wood pulp (led by Brazil and Chile). Special mention should be made of Uruguay where the forestry sector has been especially dynamic during the last 25 years. In that period Uruguay's planted forest area grew from 50,000 to 900,000 hectares. Nowadays, the country exports more than US\$1 billion a year in forestry products.

Between 2005 and 2007, LAC wood pulp exports increased as producers brought new mills on-stream to process maturing plantations and, by 2007, LAC countries, which produce mainly for export, accounted for 10% of world output. However, since mid-2008, there has been a sustained drop in pulp prices while exports of other wood products, including higher value-added manufactured goods, dropped as the U.S. housing market weakened in the wake of the subprime mortgage and economic crisis.

Non-wood forestry products, such as plants for medicinal or cosmetic uses, fruits, essential oils, resins and edible nuts, have traditionally been exploited by indigenous communities, either for their own use or for sale. However, much of this trade takes places informally and its value is, therefore, difficult to estimate.

The figures in the FAO study almost certainly underestimate the forestry sector's economic contribution, due to the different ways countries classify

forestry products and to the fact they do not incorporate either the informal sector, as mentioned for non-wood products, or the positive externalities of forests such as protection of water sources and conservation of biodiversity. This apparently small economic contribution helps to explain why the forest sector is often a low priority for policy-makers. Indeed, in national accounts, forestry is often considered simply just another branch of agriculture, despite its different needs and sometimes conflicting interests. A number of countries have, however, begun to review their forestry sectors in a bid to remedy this problem.

***Environment: LAC responsible for 65% of global net loss of forest cover***

According to the 2005 Global Forest Resources Assessment, a five-yearly survey by FAO, LAC had 912 million hectares of natural forests and 12 million ha of plantations. This represented 47.7% of the region's total land area (as compared to a global average of 30%) and 23% of the world's forests.

Deforestation in LAC accelerated between 2000 and 2005 when, according to the Global Forest Resources Assessment, the region lost 4.7 million hectares of forests per year, up from 4.5 million hectares annually in the previous decade. As a result, LAC accounted for 65% of global net loss of forest cover in 2000-2005. The loss was most acute in Central America where, despite a small gain in Costa Rica, forest cover diminished at an annual rate of 1.2%. However, the Caribbean saw a 0.9% annual increase, due largely to growth of secondary forest in Cuba.

South America accounts for 90% of LAC's forests but the annual rate of loss reached 0.5% in 2000-2005, with all countries apart from Chile and Uruguay showing a decrease. These two exceptions were explained by large-scale industrial planting. More recent figures may also show a similar trend in Argentina and, possibly, Colombia. Tree planting helps to compensate for loss of natural forest and increase carbon fixation, but without the biodiversity benefits of old growth forests.

**Table 3.** Forest Distribution in Latin America and the Caribbean, 2005 (thousands of hectares and % of the total in America)

Region	Ha (Thousands)	% of total area
South America	831,540	90,0
Central America	22,411	2,4
Caribbean	5,974	0,6
Mexico	64,238	7,0
<b>Total</b>	<b>924,163</b>	
<b>Percentage of world forests in LAC = 23.4%</b>		
<b>Source:</b> FAO, Global Forest Resources Assessment 2005.		

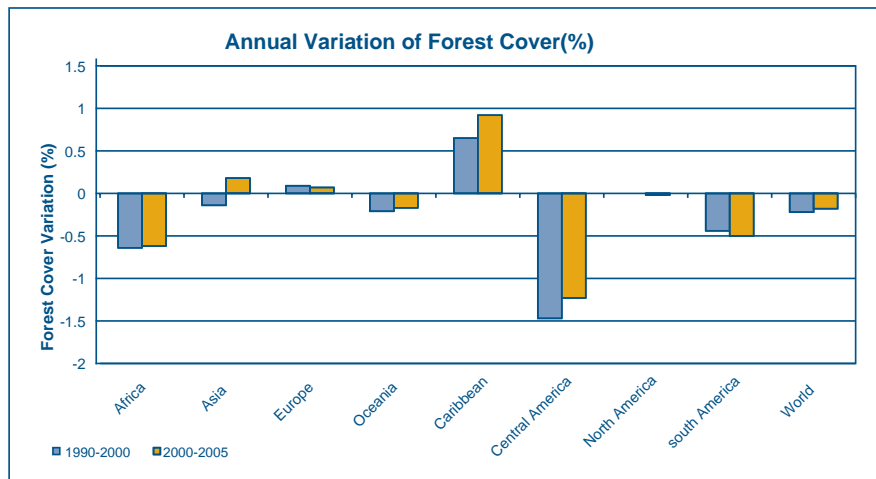
In recent years, rising global demand for agricultural and livestock products is increasing pressure on forests around the world. The advance of farmland into forested areas is one of the main reasons for loss of forest cover and explains the increase in the rate of deforestation in the Amazon in 2008, after deforestation had slowed in each of the previous three years. Increased deforestation is attributed partly to higher world food prices, which are an incentive to clear land for agriculture and livestock purposes.

***Conservation: A mostly private affair***

At present, 19% of LAC's forests are protected, ranging from 8% in Mexico to almost 46% in Belize. However, some countries lack national conservation policies and institutions responsible for the management of national parks and other protected areas tend to be weak. The income that national parks generate, mostly from admission fees and charges for the use of facilities, often goes into a central fund. This deprives individual parks of incentives for increasing their revenues and renders them dependent on the fiscal budget and its constraints.

However, private protected areas have shown a sustained increase in recent years, particularly

**Figure 4.** Annual variation of forest cover.



Source: FAO 2008.

in export-driven economies. Companies are increasingly aware that, in the eyes of consumers in industrialized countries, private land conservation - even if not directly related to their core business - can serve as an attractive addition to their credentials. This process would be hastened if legal mechanisms and tax incentives, which are still lacking in most LAC countries, were introduced.

According to the International Tropical Timber Organization (FAO, 2009d), LAC had 12 million hectares of certified forests by 2007 (4% of total forests certified globally), which, although equivalent to only 1.2% of the region's forests, represented an important increase from just 0.4% in 2002. The vast majority of certification work is carried out by the Forest Stewardship Council (FSC), although Brazil and Chile have developed their own systems. However, particularly for small producers, the costs of certification can outweigh the benefits.

***Institutional and legal framework:  
The national forestry programs (NFP)  
as the first widely agreed upon sustainable  
management framework***

In most countries of the region the forestry sector remains a low public-policy priority in relation to its economic, environmental and social importance, but significant progress has been made in recent

years towards sustainable forest management. A number of countries have drawn up or implemented national forest programs while cooperation in areas such as the prevention and control of forest fires has increased, and some countries are pointing the way forward through innovative schemes that include payment for environmental services.

In the context of LAC countries' development of stronger legal frameworks for forestry, National Forest Programs (NFPs) have been put in place as a vehicle for formulating and implementing forestry policy at the local and national levels. Twenty-six LAC countries, out of 33, have so far adopted the concept of NFPs, although implementation is still very mixed and significant challenges remain in many countries. The importance of NFPs lies partly in the fact that they are the first commonly-agreed sustainable management framework that is applicable to all countries and all types of forests. As well as their local benefits, they also serve as a basis for implementing international sustainable management agreements.

Civil society participation in the design of NFPs is crucial for their legitimacy and the effectiveness of the governance they provide. In this context, 14 LAC countries and three sub-regional organizations have joined the National Forest Program Facility, a funding mechanism and information initiative launched in 2002 to promote stakeholder

participation in drawing up NFPs. The Facility, financed through a multi-donor trust fund supported by 13 funding partners and hosted by FAO, provided grants in LAC for a total of some US\$3.3 million, mainly to NGOs, between 2002 and 2008.

Regional cooperation has also increased through the Puenbo Initiative, supported financially by the Dutch and German governments, and led by the Central American Commission for Environment and Development (CCAD), the Amazon

Cooperation Treaty Organization (ACTO) and FAO through its Latin American and Caribbean Forestry Commission (LACFC).

The Initiative was set up - after a workshop held in Puenbo, Ecuador in 2002 - as a forum for regional debate about forestry policy issues. Through its links with multinational organizations, the Initiative has been able to assist LAC countries in implementing international forestry conventions and, through information sharing, in drawing up or improving NFPs. Its first phase came to an end in 2008 but it will probably be extended for a second three-year phase with support from the Netherlands.

In response to the so-called Forest Principles recommended by the 1992 United Nations Conference on Environment and Development (UNCED), LAC countries have gradually begun to draw up legal frameworks for their forests (as distinct from agriculture in general). This process has accelerated over the past five years during which time six LAC countries drew up new forest laws, creating improved conditions for investment in the sector.

In one of the most important initiatives, Brazil - which alone accounts for just over half of LAC's forests - introduced legislation in 2006 that uses concessions to regulate the management of public forests (see Box 13). In 2007, Chile and Argentina went on to approve laws to promote the sustainable management of native forests and in 2008 Honduras approved a new forest law that consolidates all existing legislation on the management of forests, protected areas and wildlife.

## • Forestry Outlook

### *Good economic perspectives for the forestry industry*

The region has very good wood and pulp production conditions including modern technology, low input and labor costs, good sunlight and public incentives that make its forestry sector very competitive in the

## Box 13:

### Brazil's Public Forest Management Law (PFML)

Environmentalists initially opposed Brazil's new forest law, which came into force in March 2006, because it was seen as an attempt to privatize public forests. However, it is now widely celebrated as a milestone for sustainable management and the combat of illegal logging in the Amazon where the vast majority of land is public.

The law created the Brazilian Forest Service to implement and supervise a system of concessions for the use of forest products and services for periods of up to 40 years, subject to an independent auditing system. In addition, it established a National Forest Development Fund to promote sustainable forest activities and technological innovation, financed through income from these concessions.

Brazil still does not have an explicit national forestry policy. The Public Forest Management Law (PFML) is an implicit policy within the framework of the Forest Code. However, the government is negotiating some amendments to the Code, but a number of actors are struggling against this process. For this reason, the government, with the financial support of the EC and the technical advice of FAO, is implementing a project along the Road 163, connecting Cuiabá (in the State of Mato Grosso) with Santarem, (in the State of Pará), aiming at identifying viable approaches for the integrated territorial development process to be scaled up in other areas of the Amazonia.



long-run. Moreover, the recent introduction by the Russian Federation of a 50 Euro per metric ton export tax on wood pulp has dramatically reduced the competitiveness of European products and created an opportunity for LAC countries. Once the world economy and export markets recover, activity and industrial forestry investment in LAC, both domestic and foreign, should pick up. This will, however, depend on a number of other factors, including the ability of the region's forestry industries to retain their competitive edge over producers in industrialized countries. This will, in turn, be determined largely by land prices that, in Chile and Brazil, have been rising sharply in recent years. Southern cone countries, principally Argentina and Uruguay as well as Brazil, are the prime candidates to attract foreign direct investment in forestry, but potential investors will be looking closely at legal guarantees for potential projects.

On the other hand, income from non-wood products could surge exponentially in coming years with a more sophisticated type of marketing for which small producers lack the scale and know-how. One example of the potential of these products is provided by Sambazon, a California-based start-up company that, by 2007, was generating sales of US\$15 million from açai berries, an antioxidant, that grows wild in the Amazon. However, this example also highlights some of the potential hazards of such developments. While Sambazon uses local families to pick the wild berry, its success has encouraged other investors to establish plantations, raising concern that the berry could eventually lead to a loss of the diverse forests in which it grows wild.

In many cases, non-wood products overcome wood in terms of overall value. Moreover, the exploitation of non-timber products has a lower environmental and better social impact for the rural communities than timber products. In the Amazonian region, there are many products already used like natural gum, natural drugs and foods (like Acai, Cupuacú, Guaraná, Castaña, and many others).

Ecotourism is also growing in LAC. The Caribbean, Costa Rica, Ecuador, Panama and Peru appear to be most active countries or regions in this field

while Brazil, Mexico, Guatemala Chile, Argentina and Bolivia are considered to possess important untapped potential.

### ***Environment: Forest cover continues to shrink***

FAO anticipates that forest cover in LAC will continue to shrink. It estimates that, by 2020, forest cover will have dropped to 881 million hectares, 43 million hectares less than in 2005. While forest area in the Caribbean region is expected to remain stable, both Central and South America will continue to show net losses, although the annual rate of loss will probably decrease. Furthermore, new planted forests will partially offset the losses in terms of area but not in terms of ecological value.

The international economic crisis may provide a temporary respite by slowing the expansion of agriculture and cattle-breeding. However, fiscal revenues are also expected to drop sharply in 2009, and probably 2010, as the region's export markets weaken and rising unemployment creates new pressures on government spending. This situation, combined with tight international liquidity and the weak institutional and legal framework, means that in the coming years LAC will face challenges in maintaining the funding required for progress in the management of its forests.

### ***Climate Change: Forests are more than just carbon sinks***

An estimated 17% of greenhouse gas emissions worldwide are the result of deforestation, mostly in developing countries, and some studies suggest that, in the case of LAC, the figure may be close to 50%. However, climate change in the form of reduced rainfall also poses a threat to forest cover in LAC. This vicious circle, of declining forest cover and lower rainfall, is reinforced by the increased risk of forest fires as a result of higher temperatures and drier conditions.

FAO's Latin American and Caribbean Forestry

Commission (LACFC) has assisted countries to draw up regional and sub-regional strategies as well as a set of guidelines for preventing and managing fires. Many countries have developed efficient methods of forest fire prevention involving the private sector in the process. Nevertheless, most countries still need to substantially improve their prevention systems especially in conservation areas. However, further progress will depend on funding for training and equipment from public and private institutions. For that reason, LACFC is very concerned about the reduction of the financial and technical support from the international community for forest fire management in LAC.

Although more research is still required, knowledge about the likely impact of global warming on

LAC's forests has been increasing in recent years. According to the Intergovernmental Panel on Climate Change (IPCC), the consequences in the region are likely to include the replacement of tropical forests in the eastern Amazon and central and southern Mexico by savannah, replacement of semi-arid vegetation by arid vegetation in parts of northeast Brazil and most of central and northern Mexico, more frequent forest fires in much of South America and degradation or loss of cloud forests in mountainous areas.

The Clean Development Mechanism (CDM), established under the Kyoto protocol, does not include reductions in deforestation and forest degradation rates - as opposed to reforestation - as criteria for classification as a CDM project, due largely to difficulties in measuring their contribution. This could change under the post-Kyoto system, currently being debated, although nothing has been decided yet.

It is by no means clear that an agreement will be reached at the COP15 meeting that will take place in Copenhagen at the end of 2009, or that a new agreement will extend carbon credits to "avoided" deforestation and degradation. Two international initiatives were, however, launched in 2008 to promote efforts to reduce emissions from deforestation and forest degradation in developing countries (REDD):

- The World Bank's Forest Carbon Partnership Facility (FCPF) seeks to strengthen countries' capacities to access a future system of financial incentives for REDD and to test a program of performance-based incentive payments in some pilot countries as preparation for a much larger future system of incentives and funding.
- FAO, the UN Development Program (UNDP) and the UN Environment Program (UNEP) joined forces to form UN-REDD. With a multi-donor trust fund, this initiative also seeks to strengthen country capacity in REDD as well as providing support for the development of methodologies and standards.

#### **Box 14:**

### Forest Fires: Information and Cooperation for Progress

According to the 4th International Wildland Fire Conference, held in Spain in 2007, it is difficult to accurately assess the damage - in terms of deforestation, degradation, CO<sub>2</sub> emissions and the health and livelihood of surrounding communities - caused by forest fires in LAC. At this conference, a panel on the region found that reliable information on the prevalence of fires is almost totally lacking - or not disclosed - in the Caribbean while, in South America where the panel described fires as a "severe problem", almost half of the countries do not have, or do not publish, comprehensive and reliable fire statistics.

However, cooperation between LAC countries in improving their management of forest fires has strengthened in recent years. Three Sub-Regional Networks for Forest Fire Management - for Central America, the Caribbean and South America - have been established and incorporated into the Global Wildland Fire Network (GWFN). In addition, Brazil, for example, is providing technical assistance to Colombia and Bolivia and is also discussing a possible cooperation agreement with Chile.

In the context of growing concern about climate change, it is important not to focus exclusively on forests as carbon sinks. REDD mechanisms also need to protect the rights of people who depend on forests for their livelihoods and provide benefits for these communities.

### *Treethanol: Cellulose based ethanol derived from wood products*

An estimated 60% of harvested wood is used to produce energy either by being burnt directly or in the form of charcoal, pellets or the black-liquor residues of pulp mills. However, it is probably only a matter of years before wood is also used to cost-effectively produce cellulosic ethanol or 'treethanol'. Forests based fuel production could be economically viable especially where it can be done in vast land-degraded areas and, thus, in the southern cone.

According to FAO (2009), the consumption of wood fuel will continue the positive trend registered in the last 25 years and will reach an annual figure of 290 million cubic meters by 2020.

Ethanol — nowadays mainly produced in Brazil from sugar cane and in the United States from maize, but with significant differences in the energy and emission reductions balances — offers an alternative to fossil fuels in reducing emissions of greenhouse gases and mitigating climate change. Treethanol is particularly promising as an alternative for biofuel production because it could yield 16 times more energy than required to produce it whereas, according to most estimates, sugar-cane ethanol yields around eight times more energy and maize-based ethanol a mere 30% more.

Moreover, these latter forms of ethanol create pressure for deforestation while commercial production of treethanol would require extensive new plantations that could be established on existing degraded lands. It would, however, dramatically change the economics of forestry, posing important new regulatory challenges and calling for analysis of its social consequences and impact on the livelihood of communities that currently depend on forests.

## ● Policy recommendations

### *Enhance conservation and valorization of forests and forest products*

LAC offers numerous opportunities for forestry investments that would increase the sector's contribution to economic growth and help to alleviate rural poverty while, in some cases, also providing financial incentives for their sustainable management. An example could be the commercial use of unknown forest species, which could create economic opportunities and opportunities to relieve pressure on species already commercialized. However, in most countries, some of the necessary conditions for the materialization of these investments have yet to be put in place.

A change in prevailing public attitudes is required. The economic importance and potential of the region's forests is still not fully appreciated and its role in job creation is underestimated, partly because much of the employment it creates is in the informal sector.

Moreover, large sectors of the population and the business community perceive a contradiction between conservation of forests and economic benefit, a belief that facilitates deforestation as a legitimate and, indeed, beneficial economic activity. As an additional handicap, this also means that the value that could be added to the region's exports by certified sustainable practices can easily be lost.

Updated data and information for sound policy-planning also remains a scarce commodity. This is a theme that recurs constantly across the forestry sector ranging from macro issues - like its contribution to GDP, job creation and its role in the alleviation of rural poverty - to micro issues such as the revenues generated by ecotourism or the overall impact of forest fires.

This is a key barrier to the incorporation of forestry planning as part of integrated national strategies for sustained economic development. As well as a long-term concern, this also has pressing implications in the more immediate crisis context of worsening

economic conditions and increasing rural poverty. The lack of reliable information, in fact, is a limiting factor for decision making on natural resources sustainable management and public policy design. Governments should be aware of this weakness and take action to reduce the information gap.

***Biofuel: Cellulose based ethanol offers economic opportunities for the forestry industry***

Nowadays, in addition to biodiversity conservation, wood-based ethanol and climate change are two long-term challenges for LAC's forests that override all others. These two phenomena will be crucial in shaping the future of the sector and preparation is, therefore, vital.

A number of LAC countries, particularly Brazil and Chile, are already engaged in research on the commercial development of cellulosic ethanol. This would open up vast new economic opportunities for the region's forestry industries, but also important new policy challenges.

Policy development in this area is still in its infancy but it is clear that a new regulatory and, probably, institutional framework would be required. Commercial production of ethanol would imply an extension of the area under planted forests, with the possibility of bringing marginal or degraded land into production, but would also have social consequences calling for careful analysis and, probably, mitigation.

***Climate Change: Mitigation through payment for environmental services***

Payment for environmental services provided by a forest in terms of, for example, protection of water sources, promotion of ecotourism, carbon capture, prevention of erosion and desertification or the conservation of biodiversity can also help to make sustainable management economically viable. These services have always existed, but were previously regarded simply as positive externalities.

**Key tasks:**

- **Sustainable management.** In order to implement and maintain sustainable practices, these must be more profitable than deforestation or degradation.
- **New sources of forest income.** Strategies for achieving economically viable sustainable forest management include product diversification as well as the development of non-wood forest products, payment for environmental services and private concessions for activities such as ecotourism.
- **Funding.** In the short term, as fiscal revenues shrink and social pressures on government spending increase, new sources of finance will be needed to fund sustainable forest management initiatives.

**Key issues:**

- **Climate change.** Global warming poses a threat to forests in LAC, but their role as carbon sinks could also mean new economic opportunities as well as challenges to improve this role.
- **Wood energy.** The commercial development of wood-based ethanol would mean a major shift in the economics of forestry in LAC, opening up the possibility of a variety of upstream and downstream activities, but also posing important new regulatory challenges.
- **Small Scale Integrated Production Systems.** The integration of community development, forestry, livestock, agriculture, aquaculture and ecotourism is a win-win strategy which can benefit from mutual synergies and reduce negative environmental impacts.

In order to correctly pay for environmental services they need to be properly quantified and their externalities taken into consideration in terms of their public contribution. In other words, from a modern and integrated management perspective, regardless of the production potential, landowners should benefit from the positive externalities they provide to society.

In LAC, Costa Rica has pioneered the use of this mechanism. In a forest law introduced in 1996, it identified four services (water services, carbon capture, conservation of biodiversity and scenic beauty and recreation) for which the government can pay private landowners. In addition, it allows landowners to charge electricity generators and water companies operating lower down the same river basin for reforestation or conservation.

At present, Costa Rica is paying landowners who manage their forests in a sustainable way or undertake reforestation between US\$226 and US\$580 per hectare annually. This is financed out of a tax on oil-based fuels, the sale of carbon credits and international donations.

A number of other countries, including Colombia and Mexico, now also have laws regulating payment for environmental services. However, in other countries with environmental service payment initiatives, the system exists only informally.

Climate change, as discussed before, is closely connected with forest loss. At the same time, the adoption of financial mechanisms to prevent deforestation and soil degradation through the selling of carbon credits, would introduce a very important new incentive for sustainable forest management in the region. Under those circumstances, sustainable forest management would be an important alternative for climate change mitigation.

Although weaker international markets may temporarily slow the advance of farmland, forestry industries and communities that depend on forests will have an incentive for unsustainable practices, with the risk of deforestation and degradation, as they seek to reduce costs and maintain cash flow.

The international economic downturn has already had a severe impact on fiscal revenues around the world. This means that LAC governments will have fewer resources to devote to sustainable forest management initiatives and capacity building and are also less likely to receive support from governments in industrialized countries and multilateral organizations.

Economic incentives for sustainable management are doubly important in order to make it more profitable than deforestation or degradation through over-harvesting and other poor practices. In this context, incentives for responsible private-sector practices in the form of concessions of public forest areas for sustainable forest management and payment for environmental services may be the most efficient and effective way of making sustainable management more lucrative than clear cutting and degrading land. This, however, requires higher levels of education and training to enable poorer sectors to tap into such schemes and benefit from those incentives.

Incentives for sustainable management that are effective for large-scale forestry companies may not necessarily be appropriate for small companies for whom certification or registration for support programs can be difficult and, in some cases, prohibitively expensive. This is particularly a concern where small-scale forest owners are under pressure from export-driven agriculture, livestock farming and urban expansion.

However, in order to take advantage of this potential opportunity, the region would have to invest in research such as baseline studies and improved auditing systems that would, in themselves, be a plus for the future of the region's forests, its sustained economic growth and the development of its rural communities.

### ***Institutional strengths and weaknesses***

Although economic exploitation of forests is not the main cause of deforestation, weak enforcement of regulation is a factor that needs to be substantially strengthened. The performance of public forestry institutions, undermined by insufficient human and financial resources, is generally considered deficient, particularly if measured in terms of preventing loss of cover.

However, structural problems also exist. It is relatively common to find responsibilities divided among different institutions - typically, the ministries of agriculture and the environment.



This situation, as well as reducing accountability, tends to increase the complexity of regulation, the costs of compliance and, therefore, the incentives for illegal activities. The institutional partition between forest management and production, that involves 60% of the LAC countries, together with the lack of coordination between the Ministry of Agriculture and the Ministry of Environment and Natural Resources, disrupts the balance between production and environmental protection policies, thus reducing their effectiveness.

In recent years, there has been a trend towards more decentralized control of forestry sectors both in countries with a central political system, such as Chile and Colombia, and in those with a federal structure such as Argentina and Brazil. However, although promising the benefit of increased civil society involvement, this process has been hampered by a lack of technical and administrative capacity at the local level.

Demand for the inclusion of civil society organizations, and local communities, in the policy-making process is one of the main challenges for forestry institutions. Their involvement is regarded as essential, both in order to provide access to local information about the costs and benefits of alternative measures and to ensure policy legitimacy. For these reasons, FAO, together with the National Forest Programs (NFP) Facility, is promoting and financially supporting, in 14 LAC countries, the participation of all relevant stakeholders in the process of policy formulation and enforcement and the promotion of a decentralized structure of forest management. A growing number of countries are interested in this approach and are going to be involved in the NPF-Facility program.

Land ownership is an additional problem for the forest sector and it requires more analysis. Forest ownership rights are often unclear or only informally established. Estimates by NGOs indicate that only around 10% of private land in the Amazon is covered by a solid title deed, making enforcement of the rights of the other supposed holders extremely difficult.

Uncertainty over land ownership reduces the producers' commitment to forest and land conservation, thus, encouraging deforestation. Typically, a cattle farmer claims the land and sells the timber rights to a logger. Once the land is cleared, the farmer sows pasture, using the land until it is exhausted before moving on to a new area and repeating the process. This practice left behind thousands of hectares of degraded land.

Moreover, even where tenure is established, it can be challenged by indigenous communities. This is the case in the south of Chile where indigenous Mapuche communities claim an ancestral right to land acquired by forestry companies in the second half of the 20th century.

A number of Latin American countries, including Brazil, Colombia, Ecuador and Bolivia, have transferred legal ownership of forest lands to indigenous communities. However, due to ongoing disputes over ownership and lack of enforcement, this has not prevented illegal occupation or necessarily resulted in sustainable management.

Countries like Brazil, Argentina and Chile are in the process of revision of their forest codes and legislation to address the ownership rights issue. The challenge they will probably face is the enforcement of the revised legislation and in particular the overall strengthening of the institutions in charge of the forest resources.

In most countries it would be necessary to revamp the institutional architecture for forest governance, increase investment and promote expanded forest-based trade, based on assessments and achieving a balance between production and conservation. In addition, it will be necessary to revise or remove the constraints placed on local communities to establish their own regulations, ensure accountability of local authorities, strengthen forest tenure rights, to foster sustainable forest management and expand or create opportunities for more transparent and participatory decision making.



- **Conclusion**

Despite the lack of reliable information, the forestry sector in LAC is economically very important. LAC, especially in the Southern Cone with its economies of scale, is an important world actor in forestry production and export. Moreover, it has very good perspectives for expansion in the coming years. However, the traditional forestry wood production only represents a part of its overall economic, social and environmental importance.

Public policies should be strengthened in order to valorize the huge potential of the sector to produce

positive environmental, economic and social externalities. This potential is better expressed when attention is paid to synergies of the forestry sector with other production and service activities.

Forestry is also a strategic natural resource able to provide important services like biodiversity, carbon sequestration and water and land protection. To have mechanisms able to identify and pay for those externalities should be a government's priority. Governments in the region should have a wider vision of the sector, paying due attention to its potential as a source of economic dynamism in times of crisis.



## **Section II: Rural well-being and institutional framework**



## ***Employment and rural development***

**More investment to reactivate rural economy, generate rural employment, improve food security and preserve natural capital and the environment**



### **FACTS**

- **Poverty** is endemic in the rural regions and while the rural population— as per the each country's definition— represents some 22% of the LAC region's total population, rural poor people represent a third of the total poor and rural indigents a half of the total indigent people. Improvement tends to be slower than in urban areas when the economies grow solidly (e.g. the 2002-2007 period) but in economic downturns, rural areas tend to fare less worse, as in the current crisis of rising food prices, falling exports, increasing input costs, rising unemployment and falling remittances.
- **The increase in non-agricultural employment** and salaried employment has been changing the profile of rural employment. Youth till middle-age and women are particularly to be found in non-agricultural employment while among those occupied primarily in agriculture there is a preponderance of very young and third age as well as less educated, mainly males. Average income is among the lowest of all occupations; so is productivity.
- **Public infrastructure and services** are much more expensive to provide in rural settings where population density is low, human settlements are dispersed in often mountainous or otherwise complex geographic settings. Therefore and because of the lack of political voice, rural populations tend to have less access to potable water, electricity, roads, telecommunication and other infrastructure as well as health, education and other public or private services.
- **Basic needs** tend therefore to be less well covered in rural areas than in urban ones. In fact, as population density decreases unmet basic needs increase. However, in areas with similar population densities, as the population primarily occupied in agriculture increases, unmet basic needs also increase.

Even though a reduction in rural poverty in many countries of the region was foreseen, this has not yet become a reality for the rural population of LAC in the last two years as a result of rising food prices, the impact of the global financial crisis on employment and also the effects of global warming on crops. However, in face of the challenge of the food and financial crises, investing more in agriculture can help governments improve food security, provide employment, reactivate their economies and improve environmental management.

As it was indicated in previous chapters, a trend of rising prices in food products is expected in the long run, which should stimulate agriculture-related activities in rural areas and create employment opportunities in the long term. However, historically, lack of opportunities in rural areas and low wages have led to a drain of youth from the countryside in search of better opportunities. Policies are needed to reverse this trend and give youth hope in the future of their communities.

Moreover, developing rural areas and increasing food production is in the best interests of all citizens because everyone is affected by higher food prices and unemployment. A strong rural sector is an excellent way to ensure local and regional backward and forward linkages, a necessary condition to provide employment and drive economic development in Latin American countries.

But this requires long-term integrated policies that address different kinds of assets, infrastructure and services. Indeed, public policies tend to treat poverty, food security and the environment separately, but in rural areas they are closely linked. Fighting poverty means improving food security and protecting the environment. And improving food security means fighting poverty and making agriculture environmentally sustainable. Therefore, governments should choose policies for rural development that integrate all of these issues.

Welfare payments and subsidies can help in the short-term, but in the long-term they may become a heavy fiscal burden and create perverse incentives.

### • Recent Trends in Rural Development

Although there is a lack of updated statistics on some key development indicators, especially for rural areas, some inferences can be made

- *Rural areas continue to be overrepresented in poverty statistics.* Despite an overall reduction in rural poverty in LAC in the last decade (11.0 percentage points in poverty and 9.5 percent points in extreme poverty, between 1997 and 2007), in 2007 more than half of the rural population was poor (52.1% vs. 28.9% in urban areas) and more than a quarter were extremely poor (28.1% vs. only 8.1% in urban areas (CEPAL, 2008c).
- *Self-employed farmers are worse-off.* The majority of self-employed farmers suffered a decline in their incomes during the 1990s and first half of the present decade with the exception of

farmers in Chile, Paraguay and Colombia. In many countries, average farm incomes do not exceed the poverty line (Dirven, 2007).

- *Level of public investment has declined.* Public investments in agriculture and rural areas have declined over the past decades in per capita and agricultural GDP terms. Moreover, an important portion of rural investments have gone towards private goods, with a low social return (Soto et al, 2006).
- *Workers migrate to urban areas in search of work, better services and a brighter future.* Although the overall rural population increased in 19 countries (mainly Central America and Andean countries) in the region as a whole, there was a total decline of about 2.3 million residents (CELADE, 2008). As a result of that trend and the natural growth in urban population the proportion of people living in rural areas declined from an average 28.9% in 1990 to 22.5% in 2005. It should be noted that the definition of 'rural population' varies from country to country. If the OECD definition of less than 150 inhabitants per square km is used, the rural population in the region has risen sharply to 46% of the total population, around 2000 (Chomitz et al., 2005).
- *The rural population has aged due to migration (especially youth), lower birth rates and longer life expectancies.* While the rural population increased from 120.3 million in 1970 to 156.8 million in 2000, it is expected to decrease to 140.7 million in 2030 due to migration and a sharp decline in birth rates. The proportion of children and youth (0 to 29 years of age) within the total rural population went down from 71% in 1970 to 51% in 2000 and is expected to decline further to 42% in 2030. In the meantime, the proportion of the rural population over 60 years of age remained practically unchanged around 6% between 1970 and 2000, but is expected to increase to 13% in 2030 (CELADE, 2008).
- *There is a lack of opportunities for youth and women who have more limited access to jobs and*

*productive assets than adult males.* Around 2005 the proportion of rural women without own-income (51%) was considerably higher than that of urban women (38%) and the difference between men and women without income among all age groups also was considerably larger in rural areas, especially the youth. For example, 71% of the rural women in the 15-24 age group did not have an income vs. 49% in the case of men, while in urban areas the percentages were 58% and 46%, respectively (Dirven, 2007).

- *Social protection measures are inadequate.* The region's labour markets have not fulfilled their role of providing universal access to social protection systems, especially in rural areas and for informal workers. Vulnerable workers, such as temporary workers, have no social safety net to protect them when labour demand is slack, and self-employed and family workers (which tend to account for over 50% of the rural employed) are often unable to save enough money to see themselves through difficult situations and avoid slipping below the poverty or indigence line. In rural areas, only 23.9% of salaried rural workers are covered by social security programmes vs. 43.9% in urban areas. The situation is even worse in countries where social security programmes offer limited coverage even in urban areas, as in the cases of Bolivia, Ecuador, Guatemala, Honduras, Nicaragua, Paraguay and Peru (CEPAL, 2008c).
- *Pledges made by international organizations as a result of the food crisis have not yet translated into real contributions to agricultural and rural development.* The High-Level Conference on World Food Security was held in Rome in June 2008. At that event, the delegates of 181 countries reaffirmed the need to produce more food, particularly in low-income food-deficit countries and therefore to invest more in agriculture. Although it was not a pledging conference, US\$11 billion was

promised. Adding other announcements before and after the conference, a total US\$22 billion was committed. Still, although there have been encouraging signs such as the European Union's approval of the 'Food Facility for Developing Countries' amounting to 1 billion Euros, the replenishment of IFAD's resources and greater credit for the agricultural sector from the World Bank, money pledged for agriculture still falls far short of the level promised and required.<sup>22</sup> Furthermore, international cooperation institutions are earmarking fewer and fewer resources for LAC.

- **Importance of agricultural and non-agricultural labor-income**<sup>23</sup>

In general, the composition of rural household income in LAC shows significant differences amongst countries and income strata (indigent, poor non indigent and poor)<sup>24</sup>. Income from agriculture activities represents a larger proportion than non-agricultural income among indigent in all countries, except in Costa Rica and Colombia. In the other groups (poor non-indigent and non-poor) income also tends to originate mostly from agricultural vis-à-vis non-agricultural employment, including Colombia and Costa Rica, but with the exception of the rest of Central American countries.

Income from self-employment in agriculture (i.e. the occupational category that characterizes family or campesino agriculture) usually is not the most important component of rural household income; however, in most cases it is higher for indigent households than for non-indigent. The countries where non-agricultural income is an important component of rural household income (more than 30%) are Nicaragua and Paraguay (amongst the three income groups), Peru (indigent and poor non-indigent); and Brazil, Bolivia and Ecuador (only indigent households).

<sup>22</sup> *High-Level Meeting on Food Security for All, Madrid, 26-27 January 2009, Address by Jacques Diouf, Director-General of the Food and Agriculture Organization of the United Nations (FAO) and Vice-President of the UN High-Level Task Force on the Global Food Security Crisis.*

<sup>23</sup> *This section is based Faignuennbaum (2009) and Klein (2009).*

<sup>24</sup> *See the annex for country data on the proportion of rural population and on the incidence of poverty and indigence.*

Salaried agricultural income is higher than 20% of total household income in most countries; however, it tends to be a smaller portion for non-poor households (Colombia is an exception, because salaried agricultural income represents almost 30% of total income for non-poor households). On the other hand, salaried non-agricultural income represents between 20% and 30% of total household income, especially for non-poor households.

In most countries diversified and multi-activity households are not a significant portion of households. The most noticeable exceptions are Peru (more than 70%) and Mexico (more than 50%). However, it is the most common household type in Brazil, Ecuador, Guatemala, Honduras, Nicaragua and Paraguay.

There are also some countries (Costa Rica, Chile, Ecuador and El Salvador) where indigent households earn an important proportion of their income (more than 20%) from non-labour sources; that is, from transfers or remittances. However, there are differences. In Costa Rica and South American countries that income comes mostly from government transfers, as part of social protection programs targeted to the poor; in El Salvador, on the other hand, the composition of non-labour income is more balanced between transfers and remittances. In Brazil, rural non-poor households receive most of their income from government transfers, result that is explained mainly by a retirement programme that pulled-out from poverty many households.

Regarding remittances, in absolute terms they are more important for rural non-poor households than for both groups of poor households, almost without exception. In relative terms, however, remittances tend to weight more in the total income of indigent households vis-à-vis the poor non-indigent and non-poor. As a proportion of total household income the contribution of remittances ranges between 21% in El Salvador (2004) and 1% in Brazil (2007) and Peru (2003)<sup>25</sup>. Honduras is an exception, because remittances are a higher proportion of total income among rural non-poor households: 21% of their total income (Klein, 2009).

## ● Gender inequities in income and employment<sup>26</sup>

Women tend to be less integrated to the labour market than men; but, mainly for idiosyncratic reasons, this is more accentuated among rural inhabitants. Thus, around 2005 and as an average for LAC, the activity rate of rural men was around 85.3% vs. only 46.4% for rural women. However, there is significant country variation in the activity rate of rural women, from less than 25% in Chile and Venezuela, to more than 65% in Peru and Bolivia. Yet, the situation has changed strongly for rural women over the last decades, with an increase of 14 percent points in the activity rate since 1990. Moreover, an important proportion of rural women work as non-remunerated family workers in agriculture.

Men are more present than women in agriculture and women more than men in non agricultural occupations in all countries, but with large country differences. Yet, the higher presence of non-agricultural occupations in the distribution of rural women employment does not translate in large numbers in absolute terms, given their lower participation rate in the labour rural market. When we compare the occupational categories of rural men and women in agricultural and non-agricultural activities, men dominate in self-employed agricultural activities, while women are more frequently employed in self-employed non-agricultural activities. Similarly, men are strongly oriented towards salaried work in agriculture.

There is also a rural income-gap in favour of men in all countries, except for rural women working in agriculture in Honduras. In some countries the gap is lower in agricultural activities (Brazil, Chile, Ecuador, Peru and Honduras), while in others it is lower in the non-agricultural sector. The largest gap is found in Bolivia, where women agricultural workers have an income that is only 40% of that received by men.

Working conditions for rural inhabitants are often worse than those of urban dwellers, even for similar occupations (Balsadi, 2008). This can be seen, among

<sup>25</sup> Mexico was not included in the study because data inconsistencies.

<sup>26</sup> Based on Ballara & Soledad (2009).



other, in a high degree of informality and a very low rate of affiliation to social protection systems, especially in agriculture, with the exception of a few countries such as Chile and Costa Rica. Affiliation rates among rural non-agricultural workers is usually two-threefold that of agricultural workers. With the exception of Bolivia in non-agricultural occupations, women have a lower affiliation rate than men, which can be explained by the higher participation of the latter in salaried activities. On the contrary, in many countries affiliation rates to social protection systems in agriculture are higher for women than for men—in some cases substantially higher.

### ● Perspectives for rural development

Given increasing unemployment and falling remittances expected in the short term (CEPAL, 2009b), and rising food prices (FAO-OECD, 2009b) and global warming (IPCC, 2007) expected in the medium to long term, the outlook for rural development is not auspicious. On the other hand, agriculture is more resilient to the boom-and-bust cycles than other sectors of the economy because of the low elasticity of food demand. And as it was also indicated, with adequate support and policies small-scale agriculture in LAC can play a role in substituting food imports to feed the local population.

#### *Price volatility: ambiguous effects on rural development*

Commodity prices have fallen since the economic crisis began, resulting in an alleviation of food-inflation pressures that brings relief to consumers. Since rural salaried workers and many small-scale farming families are net food buyers, they are also hurt by higher food prices.

But, due to the cycle of the growing season, crops in the Southern Hemisphere were sown and fertilized in the expectation of receiving high prices for harvests, when agricultural input prices were still very high and before the crash of financial markets in

October 2008. Since crops were harvested at a time when prices had fallen, farmers faced a situation characterized by high cost and low revenues (see special chapter on price volatility). This has had devastating effects in some rural LAC regions. Because of the linkages between agriculture and local economies, many non-agricultural workers could lose their jobs or earn much less than expected.

In addition, many governments are facing a reduction of fiscal revenues as a result of the economic crisis (CEPAL, 2009b) and may put off investments in agriculture and rural areas in favor of urban-biased job creation projects. But these projects tend to only bring jobs and benefits in the short term. Instead, governments should not lose sight of the fact that that investing in rural areas helps farmers and other rural dwellers improve their productivity and protect themselves from future commodity and other price volatilities.

With the rise in agricultural prices, the demand for rural non agricultural services could increase if agricultural production responds to higher prices.

Due to lower transaction costs and greater negotiating power, large-scale commercial farms generally receive higher prices for their produce. But, this does not necessarily benefit agricultural workers as salaries have not increased at par with labor productivity in most countries.

“The food security agenda should focus on agriculture and rural development by promoting sustainable production, productivity and rural economic growth. At the same time, coherent policies to foster economy-wide growth, which is inclusive and environmentally sustainable, are to be pursued in conjunction with social protection mechanisms such as safety nets and social policies for the most vulnerable.

“L’Aquila” G8 Joint Statement on Global Food Security, L’Aquila 10 July 2009.

### *Falling remittances*

Remittances from abroad are an important source of income in many LAC countries. A study using data from 2006 (IFAD, 2007), determined that remittances represented 3.3% of regional GDP and 11% of total exports, with significant differences amongst countries, from less than 1% of GDP in Argentina, Brazil and Chile, to more than 20% in Honduras, Guyana and Haiti. Furthermore, remittances constitute more than half of the income for approximately 30% of the recipient families (IADB, 2009). It is estimated also that remittances sent to rural areas represents about a third of the total flow; much of that income is used to cover daily necessities such as food, clothing and housing, but also for investments in agriculture and other economic activities (IFAD, 2007, IADB, 2009). Then, in many countries remittances are important both for maintaining macroeconomic stability and preventing poverty from increasing. Moreover, because a large proportion of remittance flows are spent locally, repercussions of their fluctuation over rural economies are usually strong.

Due to the financial crisis, remittances have dropped-off sharply. The reduction started during the 4th Quarter 2008 and deepened during the first semester 2009, with the greatest effects in Central American countries (El Salvador, Guatemala, Honduras, and Nicaragua), Mexico, Ecuador, Jamaica and The Dominican Republic. For the region as a whole, remittances are expected to fall between 5%-10% in 2009 (CEPAL, 2009b), after reaching a record high of US\$69.2 billion in 2008 (IADB, 2009).

### *Rising unemployment*

Increasing unemployment in Latin American cities and in developed countries as a result of the financial crisis will likely —as in past crises—

increase the importance family-based safety nets. Migrants returning to their places of origin, in many cases rural areas, will mean more mouths to feed with less money.

Another negative consequence of the global financial crisis — as noted in previous chapters— is the drop in overseas demand not only for agricultural products, but also for mining and industrial goods, which could have also a negative impact over non-agriculture rural employment and income. Ecotourism is another important source of employment in some rural areas and the demand for these services has fallen drastically as well.

### ● **Policy Recommendations**

IFAD's President, Kanayo Nwanze, recently declared that "Agriculture should be the backbone of economic development of any country... it is the key to food security and a fundamental engine of economic growth and wealth generation"<sup>27</sup>. This view is shared in what follows.

Food-price volatility and the financial crisis threaten to undo progress in poverty reduction in general and especially in rural areas. At a regional level, progress in meeting Millennium Development Goals on poverty reduction is much less in rural areas (61% of goal) than in urban areas (nearly 100%). This tendency is seen especially in countries with low advances at a national level like Bolivia, Guatemala, Honduras and Nicaragua, but also in Colombia and Mexico which have made significant progress. On the other hand, those countries that have made the most advances in poverty reduction in rural areas tend to be the same countries with largest progress nationally like Brazil, Chile and Costa Rica. In these countries poverty reduction in rural areas is similar or higher than in urban areas, essentially

<sup>27</sup> Kanayo Nwanze, IFAD's President, at the Seminar "The Global Finance Crisis and the Rural Sector: Options for IFAD engagement", Rome, April 23-24, 2009.

because of focalized transfer programmes and not owing to the “agricultural boom” (Dirven, 2007 and FAO/RLC research in-progress).

The good news is that investing in agricultural and rural development contributes to sustainable development, food security, limiting migration and ensuring peace. It also gives proportionally higher returns than investing in other sectors (World Bank, 2005). But perhaps the strongest argument for government action is that stimulating food production is in the best interests of all citizens, not just rural inhabitants.

### *Improving Food Security*

In the short term, governments need to protect the most vulnerable sectors of their populations, including in rural areas, from the negative impacts of the economic crisis and higher food prices. This means implementing programmes that guarantee access to basic foods in sufficient quantity and quality, especially for children, women and older people. Such programmes have already been implemented in some countries including food subsidies and lunch programmes in schools.

On the supply side, governments must strengthen the capacity of small-scale farmers to produce food and contribute to the recovery of the economy. Policies could include soft loans, the direct purchase of agricultural products from family farms or rural firms to be distributed among the poorest sectors of the population and programmes to build infrastructure and recover environmentally degraded areas for agricultural use. Policies should also be geared to improve performance and transparency in agricultural markets.

Some countries have developed counter-cyclical policies for the rural and agricultural sector (see macroeconomic context). For example, Brazil

increased resources to be distributed to farmers, special funds for cooperatives, the Workers’ Protection Fund and support for family agriculture. Mexico increased credit for the rural sector through its rural financing programme (FIRA). Guatemala assigned funds for rural development programmes and increased the minimum wage for agriculture and non-agriculture workers. Panama implemented a programme with low-interest financing for food producers (CEPAL, 2009a).

### *International Cooperation*

LAC governments should insist that developed countries, and international agencies, make good on pledges to increase aid for agriculture and food security programmes in the region that were made in response to rising food prices, and negotiate that a larger portion of those funds goes to the region.

The World Bank established in May 2008 a fast-track facility under the Global Food Crisis Response Programme (GFRP) to support global efforts to cope with the food crisis. By June 2009 the facility had approved projects totaling US\$ 1,200.4 million in 33 countries, including US\$ 42.0 million for Latin American Countries<sup>28</sup>. In April 2009, the World Bank’s Board of Directors approved a new ceiling of US\$2 billion.

More recently, the G8 summit held in L’Aquila, Italia, emphasized that sustained and predictable funding and increased targeted investments are urgently required to enhance world food production capacity. Recognizing that need and the effects of longstanding underinvestment in agriculture and food security, developed countries pledged to devote US\$ 20 billion dollars in 3 years to support agricultural development that directly benefits the poorest and makes best use of international institutions (L’Aquila” Joint Statement on Global Food Security, L’Aquila 10 July 2009).

28 US\$ 17 million for Nicaragua, US\$ 15 million for Haiti, US\$ 10 million for Honduras (World Bank, Global Food Crisis Response Program, Project Status, June 11, 2009 – available at <http://www.worldbank.org/html/extdr/foodprices/pdf/GFRPProjectStatus.pdf>), consulted June 2009.

### *Policies for the rural labour market*<sup>29</sup>

An important portion of rural poverty can be explained by poor labor conditions and by low participation rates in the labor market. Nevertheless, there are various instruments that can be used to promote and improve employment, i.e., to alter the natural result that emerge from the market. They are based on the acknowledgement that labor markets have characteristics different from other markets and that leaving these markets to auto-regulation can have unwanted consequences on the social, economic and political spheres.

However, most of labor market policies are absent from the rural areas and usually have an urban-bias, as they were developed from urban labor markets. Besides, many of those institutions do not have the capacity to adapt to the ever-changing conditions in the real world and are encumbered by the lack of willingness to enforce the implementation of the existing legislation.

The policies most commonly encountered are the creation of part-time or emergency jobs, which have been applied in almost all countries of the region. Evidence shows that these policies have had a significant impact on the poorest rural households, especially in periods of high unemployment or natural disasters. However, these policies are considered as passive, since they create employment that cannot be sustained in the long-run. A special example of these programmes is the construction and maintenance of rural roads that requires intensive labor force from local communities. In addition to the direct jobs creation effect, such programmes generate links downwards and upwards, which in many cases are more important for the local economy than direct job creation.

Subsidies tied to the hiring of agricultural labor force have not been successful because, due to the seasonality that characterizes agricultural labor contracts, the jobs subsidized would have been created anyway. On the contrary, credit programs, subsidies and assistance to micro and small enterprises have been important both to increase households'

incomes and to raise women's participation rates, since many of these small firms are localized in the household itself, reducing the problem of children daycare. These programs are not only implemented by the Government, but also by non-governmental organizations that support the agricultural sector, the small industry, handicrafts and small business. In general, they include training aspects and are aimed to specific groups like young people or women.

### *Creating opportunities for youth*

Dealing with the crisis in the short term is important, but LAC countries should complement short term measures with medium- to long-term actions. Since youth are the future of rural development, and given the aging trend facing all rural areas, governments should invest urgently in infrastructure, training and services that give young people the tools and inspiration to stay and prosper.

Investing in roads, bridges and telecommunication infrastructure can create temporary or permanent jobs as well as improving transport and increasing the exchange of goods and services. This can create the foundation for more opportunities and competitiveness in rural areas. But policies should go further by giving youth access to productive assets including land and soft loans so they can start their own businesses. Such assets are currently difficult for young people and women to obtain owing to lack of collateral, or to traditions, norms or institutions, such as inheritance laws, for example, which traps them in a cycle of poverty and lack of opportunities.

Finally, in a globalized world, food producers and other small-scale rural entrepreneurs need to improve their productivity to compete in export and local markets. To this end, governments should help create clusters of small-scale farmers that can produce and sell food more efficiently and obtain discounts on inputs and services. Quite often the youth are more inclined to team work, which also can have an important catalyzing effect.

<sup>29</sup> Based on Klein (2009).

## *Technology Transfer*

Lack of modern technology is seen as an obstacle to rural development in many LAC countries because it is often either not accessible to small-scale food producers or was not developed taking their special needs into account. Part of the problem is that agricultural technology is concentrated in the Northern Hemisphere. Modern genetic engineering, in particular, is concentrated in the hands of a small group of large transnational corporations that control most of the agrifood chain, from seed research and development to production and international trade (see chapter “Institutional Arrangements for Agriculture and Rural Development”). North-South cooperation can help bridge the technological divide and allow LAC farmers to access technology that can help them improve their efficiency. Small and Medium Enterprises in developing countries can play an interesting role in a transfer of this technology that fits better LAC requirements. Greater efforts in research and development in the region are also required, as well as education and extension services to teach farmers how to sustainably use new technology.

## *Reducing environmental risks*

Climate change is one of the greatest challenges facing humanity. But governments can help to mitigate the impact of climate change on agriculture, through research and development of new methods for natural resources management and environmentally sustainable production, the construction of infrastructure and the supply of services. All those activities should involve an active participation of the rural population, due to their traditional knowledge and also because their contribution is required for many solutions. In addition, the participation can help to create rural jobs in new activities.

Climate-related events like droughts and hurricanes may be unpredictable but governments can help farmers and other rural inhabitants—including small-scale farmers in remote areas— obtain

access to meteorological information, low-cost insurance coverage and early warning systems so they can better cope with such events in the future. Governments can also help reduce the impact of agriculture on climate change by promoting crop diversity and investing in local production methods with lower environmental impact in terms of water and energy requirements as well as CO<sub>2</sub> and other greenhouse gas releases.

## • **Conclusion**

Climate change like food security is an issue that affects everyone, not just those in rural areas, so measures that reduce greenhouse gas emissions or increase food production will benefit everyone.

Since agriculture is a driver for economic development, governments should focus on agriculture and rural areas to reactivate their economies. Rising food prices represent an opportunity for farmers. The opportunities for small-scale family farms are important for rural development, but only if governments provide effective support through a package of short, medium and long-term policies. The priority, at the global level, is to make sure people have sufficient resources to meet their basic needs. LAC, the Southern Cone in particular, has an important role to play in this because of its resource endowments. Governments in the region should invest in policies that give people in rural areas opportunities to grow more food and other products and services and, at the same time, obtain decent employments and income.

These policies may not show benefits overnight, but in the long run they are needed to protect the most vulnerable in our societies from food price volatility, to improve food security, to reduce disparities between people and territories, to promote a more geographically-balanced distribution of the population, and to stop youth migration a rural drainage of capacities to the cities. By giving rural youth hope in the future and breaking the cycle of poverty, governments will be doing a favor to equity and equilibriums in the future.





# ***Institutional arrangements for agriculture and rural development***

Modernizing institutions is essential in the current context, and countries should assign priority and resources to that end

## **FACTS**

- Pro-market policies and the development model promoted by them favored weaker institutions, which could not respond to the new demands and needs.
- Policies and other types of intervention to solve rural problems have been inadequate and have not been coordinated with other policies that affect the territory.
- With trade liberalization, prior to the current crisis, concerns regarding food security were minimized given the expanding food trade. One of the most adversely affected groups was small and medium-scale producers with scarce assets.
- There is a trend toward concentration reflected in an increasing process of appropriation of lands and in highly concentrated market structures that put the weakest links in agro-production chains at a disadvantage.
- The contribution of agriculture, livestock, forestry, and fisheries to promoting sustainable, environmentally responsible development has not been fully appreciated and the capacity to design multisectoral policies in this direction has been modest.

## • Trends

### *Institutional framework for agriculture and the rural sector reassessed*

The institutional framework, understood as the interaction of rules, laws, codes of conduct, surveillance mechanisms, and organizations, shows gaps, as it has failed to adopt reforms needed to respond to the demands of a growing participation of new groups.

These gaps point to a need to reassess the role of government, which, in the context of the current international crisis, has been a key factor in mitigating the impact of the recession. As a result, reforms that seek to modernize agriculture and the rural sector today include efforts at institutional development. By way of example, institutional transformations along these lines are already under way in at least three of the following areas:

#### *i) The local scenario is adapting to the international one*

The adoption of international standards based on multilateral agreements of the World Trade Organization (WTO), intergovernmental regulatory agencies, and bilateral or regional trade agreements<sup>30</sup> is fostering unprecedented institutional reforms for agriculture in the legal and regulatory sphere, and in the operations of organizations. The participation

30 For developing countries in the region, negotiations of free trade treaties with developed countries and with strong institutions, such as in the United States, Canada, and the European Union, have fostered profound short-term reforms in the multilateral sphere, where reforms are more lax and there is greater flexibility under Special and Differentiated Treatment clauses.



of new public and private groups is also being encouraged, as is compliance with commitments by a broad sector of civil society.

An example of this trend is the application of health and phytosanitary measures that have required the increased participation of governments in these agencies, in addition to legal changes and adjustments in national agricultural health and food safety services. While these processes are taking place within government, there is a tendency for “private standards” to prevail. Private standards are quite often more stringent than official prescriptions, in some cases without sufficient scientific or technical grounds. These standards consist of a series of specifications required by large private consortiums, and they are causing concern in the international community, and especially developing countries, due to their impact on access to markets and on their legal and institutional implications.<sup>31</sup>

*ii) National research institutes are being strengthened, which requires greater investments*

The challenges to agriculture and the rural environment posed by the growing demand for food, competition by other uses, limited capacity to expand the agricultural frontier, and the already visible effects of climate change require urgent attention on the technological and institutional agenda. National agricultural research institutes (NARI) are still the main source of the production of knowledge and technology as public goods. However, investment increased at a moderate rate of 1.1% between 1981 and 2006 (IFPRI-ASTI), which is insufficient given the stake of technology in meeting these challenges.

The general trend has been toward an institutional framework of systemic research models (National Research Systems—NARS). These systems are

### **Box 15:** Implementation of DR-CAFTA

In addition to having been an ambitious trade opening process, the Free Trade Treaty among the Dominican Republic, Central America, and the United States can be described as a process of a legal and institutional migration from the North to the South. Its implementation required a new series of legal institutions and figures to be applied in virtually all the areas covered.

Issues such as transparency, nondiscrimination, the administrative and judicial accountability of the state, government processes of prior consultation, trade facilitation, computerization and e-government, and monitoring and effective enforcement of legislation, among others, have led to institutional reforms that are relatively consolidated in the United States, but not in all the Central American countries and the Dominican Republic.

**Source:** IDB-INTAL, 2007.

known for considering various sources of knowledge in managing demand, establishing public-private alliances, and for coordinating and working in networks with multiple actors located all along production chains. This type of system is seen explicitly in Costa Rica, Honduras, and Uruguay, and implicitly in many other countries in the region. In research conducted by private groups, there are relevant cases in Colombia, Brazil, and Honduras, with important contributions to the development of agriculture in those countries.

To build these systemic approaches, participation of the academic sector has been indispensable, not only for training purposes, but also for

<sup>31</sup> *The implications of private commercial norms and standards are on the WTO's agenda. This has been an item on the agenda of the Committee on Health Measures, and it has been addressed by the Committee on Trade Obstacles and the Committee on Trade and the Environment.*

conducting research and implementing agricultural innovations.<sup>32</sup> Likewise, on a regional and international plane, there is a conglomerate<sup>33</sup> of centers, programs, networks, and funds that together are the most important mechanisms for mobilizing knowledge and mutual cooperation.

Finally, due to recent concern over meeting the challenges of food security, there is a certain trend to strengthen and redesign research, technology transfers, and extension systems, issues of relevance for small and medium-scale agriculture with scarce assets.

*iii) A new view of the rural sector fosters emerging models*

Although based on different approaches in dealing with rural and territorial issues, there is action in support of a new institutional framework for Rural Territorial Development. Countries such as Bolivia, Costa Rica, Ecuador, and Guatemala have adopted models favoring concerted action, decentralization, and democratization in decision-making, and have designed and are implementing territorial policies. Mexico and Brazil exemplify this approach.

Mexico has shifted from policies formulated according to a sectoral approach to integrated policies, where various levels of government converge. They function on the basis of a new paradigm for territorial management. This process was legitimized with the entry into force in 2001 of the Sustainable Rural Development Law, which fostered processes of political and administrative decentralization. The Mexican Law places stock on the contribution of rural communities to national development,

and its key feature is promotion of coordinated, complementary, synergetic, and consistent sectoral action in conjunction with rural territories.

Another example of progress towards shaping a new institutional framework is the Brazilian Federal Government's implementation in 2008 of the



**Box 16:**

Brazil heightens the visibility of the rural world: The Program "Territories with Identity" initiated in 2008.

- Its objective: to improve the income and quality of life of the most vulnerable Brazilian peoples who suffer from greater inequalities in rural areas of the country.
- It is based on three pillars: i) support for productive activities; ii) civic-mindedness and social rights; and iii) infrastructure.
- Its strategy: to further cooperative social networks in the territories, strengthen social management, and capacity building, and promote the inclusion of the beneficiary family in production.
- It covers 120 territories and benefits millions of poor families.
- US\$10 billion to invest in 2009.
- In the second year of the program, the private business sector became involved.

**Source:** <http://comunidades.mda.gov.br/principal>. Consulted June 2009.

32 Mention should be made of the Agrarian University of la Molina (Peru); University of Chapingo and the Graduate College (Mexico); various universities in Brazil, such as the University of Campinas; University of San Carlos (Guatemala); Zamorano School (Honduras); and, the Tropical Agricultural Research and Teaching Center (CATIE) (headquartered in Costa Rica).

33 Some examples are: the Consultative Group for International Agricultural Research (CGLAR); PROCIS (PROCIANDINO; PROCITROPICOS; PROCISUR; PROCINORTE; PROCICARIBE); PROMECAFE, RED-SICTA; PCCMCA; CARDI; and, CATIE. In view of the recent problems of the food price crisis, these international organizations are receiving more financing than in the recent past.

Civic-Minded Territories Program,<sup>34</sup> which is designed to promote economic development and universalize basic programs on civic values, using a sustainable territorial development strategy. The backbone of this management model is social participation and integration among the Federal Government, provinces, and municipalities (see Box 16).

***Relevant changes in the institution framework linked to food security and small-scale agriculture with scarce assets***

Various legal reforms and internal arrangements have been changing the institutional panorama related to food. While in the 1990s, the concern was food security, at present the emphasis is on food as a right and on the goal of food sovereignty<sup>35</sup> (Chiriboga, 2009). As an example, Mexico's Sustainable Rural Development Law of 2001 refers, in Chapter XVII, to: "Food Sovereignty and Security," and states that strategies to boost production should ensure the availability of and access to food for the entire population.

Prior to the food price crisis of 2008, new laws on food security were passed in Brazil and Guatemala. More recently, Venezuela adopted the Law on Food Security and Sovereignty in August 2008. In addition, there have been recent constitutional reforms and related laws in Ecuador and Bolivia that have introduced elements related to food security and sovereignty (Soto, 2008; da Silva, 2008; Chiriboga, 2009). In general, it is apparent from institutional arrangements that priority has been given to the issue of food security on national agendas (see Box 17).

Another space for reforms has opened with recognition that agricultural policy is only part of the response to the problem of small- and medium-scale agriculture with scarce assets. It is important to point out that MERCOSUR recently

created a Regional Fund for Family Agriculture, which is given high priority in those countries. Another notable example of the increased value placed on this type of agriculture is the work that the agricultural technology institutes have been doing in LAC, including EMBRAPA-Brazil, INTA-Argentina, NARI-Uruguay, NARI-Chile, and NARI-Venezuela, among others. These institutions implement specific programs to support development and adoption of technology for these producers.

***Heavy concentration of agricultural businesses***

There is a marked global trend towards the concentration of firms in the agro-food sector, both in the supply of inputs and capital goods, and in logistics and distribution of food. This phenomenon has not escaped the reality of the principal value chains in LAC, which use the primary base of agriculture, livestock, forestry, and fisheries.

These global value chains (GVC) generate new demands for sectoral organizations, because they break with the traditional policy approaches and types of relationships among the stakeholders (Bisang, 2009).

According to a recent study by IICA (Petreccolla and Bidart, 2009), there is real evidence of a high concentration in certain links of the chains, and primarily in grains, oilseeds, sugar, fruits, dairy products, meats, and eggs, as well as in plant and animal breeding and in distribution channels such as supermarket chains:

In Brazil, four herbicide companies for soybeans dominate 53% of the market, while four companies control 75% of the hybrid corn market. In Argentina, six companies dominate

34 *It is important to recognize that as part of the evolution of the process, a previous step based on the territory was taken, when the term "identity" was used as a distinctive characteristic of territories, in the reference prior to 2008 to "Territories of Identity" (Government of Brazil, 2009).*

35 *Chiriboga (2009) points out that the different concepts of food sovereignty held by groups of countries in the region range from the group of countries that emphasizes autonomy in defining public policies, to another group of countries that takes a more socialist approach that is less dependent on international markets.*



## **Box 17:** Institutional arrangements in the field of food security and small- and medium-scale agriculture with scarce assets

### **In the Andean Region:**

- *Bolivia:* National, departmental, and municipal food and nutrition councils.
- *Ecuador:* National Food Sovereignty Conference.
- *Colombia:* Food and nutrition security programs and policies from national to municipal levels.
- *Venezuela:* Communal councils and agrarian assemblies involved in planning, trade, and distribution of agrifood products.

### **In the Central Region:**

- *Regional:* Regional Emergency Plan for the 2008-2009 Crop Year, that seeks to ensure the supply of basic grains and to reduce dependence on imports of yellow corn and rice.
- *Belize:* National Production Development Commission.
- *Guatemala:* *National Intersectoral Council.*
- *Costa Rica, El Salvador, Honduras, Nicaragua y Panama:* plans and programs to promote basic food production.

### **In the Caribbean Region:**

Work is proceeding in three areas:

- Security networks focusing on vulnerable groups;
- Interventions to influence food prices; and,
- Measures to stimulate the medium- and long-term food supply.
- Many countries in the region also have put in place Ministerial Food Security Councils.

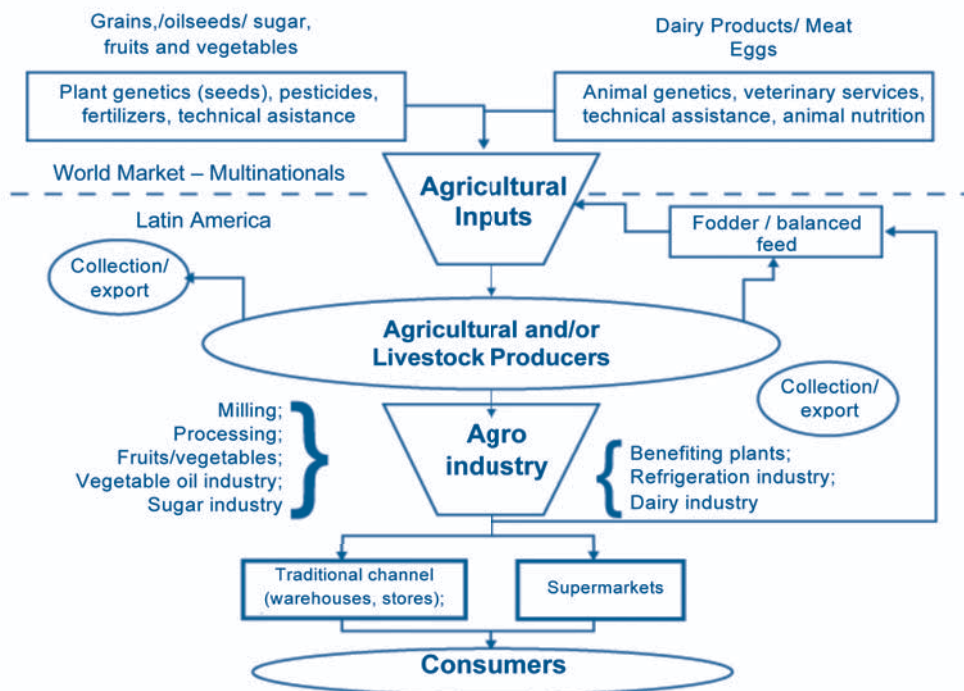
### **In the Northern Region:**

- *Canada* is participating in the Food Aid Convention, and has increased its foreign aid budget.
- *Mexico* is maintaining its Strategic Food Security Program (PESA), an inter-institutional platform that has served highly marginalized families since 2002.

### **In the Southern Region:**

- *Brazil* is continuing the National Family Farming Program (PRONAF) for small-scale agriculture and small cooperatives and organizations.
- *Chile* is working through INDAP to promote the sustainable productive development of small, family-based agriculture.
- *Argentina* has been strengthening its legal and institutional framework for family farming, and in December 2008, it implemented a Plan for Support to Small- and Medium-Scale Producers, to ensure the independent, sustainable development of family agricultural producers.

**Figure 5.** Mapping of the main links in the most important agro-food chains in Latin America and the Caribbean



**Source:** Petrecolla and Bidart, 2009.

the nitrogenated fertilizer market, and 86% of the farm machinery market.

In Colombia, four firms control 72% of the oils market, and another four control 94% of the potato, banana, and yucca market. In Brazil, there are four companies that hold sway over 75% of the coffee market and in the case of El Salvador there are two mills that have 97% of the wheat market.

In El Salvador, there are four companies that control 75% of the balanced feed market. In the dairy sector, four firms dominate 87% of the market, and in Peru two firms account for 92% of the market. There are more concentrated industries, such as egg production in El Salvador, where one company dominates 100% of the market. In supermarket chains, the highest

degrees of concentration are identified with Chile (four companies with 75% of the market and El Salvador (two firms with 98% of the market).

In contrast, small producers that demand agricultural inputs or deliver their production to large processing companies are scattered, with no negotiating power.

Concentration is a growing phenomenon linked to global businesses, and is not harmful *per se*. However, there is increasing action being taken by competition authorities in the region, that are intervening in these concentrated structures when they identify anti-competitive practices that limit access of new stakeholders and concentrate income.

*Land is scarce today, and there will be competition to obtain it*

At present, the problems facing agriculture as a result of the growing demand for food, fibers, and alternative energy sources have to do with availability of land and limits to expansion of the agricultural frontier. Although Latin America is one of the regions with the greatest land reserves for expansion of agricultural production in the world, use of those lands will require large investments, and will entail environmental and social risks, in addition to the already visible effects of climate change.

Further compounding this problem is the purchase of lands by foreign investors, a new phenomenon (von Braun & Meinzen-Dick, 2009) related to factors such as the property market, the food price crisis, food insecurity, available water supply, geographical proximity, expectations for the bio-energy business, and the current international financial crisis.

This situation is exemplified by action taken by many countries with available financial resources to implement strategies to purchase land in other countries when they saw food prices rising, as a way of ensuring the production and supply of food. Similarly, private food consortiums are stepping up and expanding operations in countries where there is available land, to ensure the supply of raw materials for the food processing industry.

One factor that contributed to this situation was the recent energy crisis, which raised the international cost of logistics and freight charges. In Uruguay, Brazil, Peru, Chile, Costa Rica, and Guatemala, among other countries, there is a growing interest in buying land for agricultural use that is bringing in new national and foreign investors. This in turn has raised the price of land and required revised laws to provide security for the investors, and greater transparency in the purchase process. In Uruguay, Venezuela, and Bolivia, there are initiatives to limit access to land on the part of foreigners. More recently, the crisis on financial markets led financial investors

**Box 18:** New regulations for access to land

New initiatives are under way in Bolivia and Venezuela to guarantee access to land to persons who do not have it. In Peru, a bill proposes to set limits to agrarian property rights for certain regions that include direct or indirect ownership as well as ownership by economic or related groups.

In Brazil, the 2nd National Agrarian Reform Plan has been in effect for the past 20 years.

**Source:** [www.coha.org/2009/04/chavez-and-morales](http://www.coha.org/2009/04/chavez-and-morales). Consulted April 2009. Also in: *Revista Gestión*, Peru, May 2009.

to purchase land as a safe asset, in contrast to the prevailing climate of uncertainty.

• **Recommendations**

*Promoting an agenda for institutional innovation*

Recognizing the weaknesses of institutions related to agriculture and rural development in a highly interdependent world, a working agenda should be developed that promotes processes of institutional innovation and development of inter-institutional work and cooperation between public and private agencies, covering a broad spectrum of actors. As part of this effort, the following should be taken into account:

- i. An informal institutional framework, within which unwritten codes of conduct are observed and there are social networks that offer services or operate within monitoring mechanisms and play an important role in rural areas, primarily



in regions where the formal institutional framework is weak.

- ii. The international legal framework and its impact on the national scene, which will require a strengthening of human, technical, and financial resources to assume commitments derived from implementation of international agreements and to make use of related benefits.
- iii. Active preparation and participation by governments of developing countries in international regulatory agencies, which is important in order to ensure that standards or regulations consider the concerns of these countries and to move towards harmonizing international standards, which, among other things, will prevent the private sector from continuing to implement its own standards.
- iv. Both national and international work networks in different areas, which are being catapulted by information and communications technologies as basic tools for management of knowledge, but which require greater investment in this sphere.

### ***Promoting management of territories***

Adoption of territorial approaches can become a way of managing multiple policy instruments, coordinating organizations linked to development, and promoting inclusive development, to close the gaps between urban and rural, and national and local, areas.

In this context, the Inter-Agency Rural Development Group<sup>36</sup> can provide a working platform to support national and regional initiatives observed in LAC, in the same way as the Ibero-American Program for Cooperation in Territorial Management

(Protectorios), fostered by the Ibero-American Summit Process.<sup>37</sup>

### ***Strengthening activities in support of food security and small- and medium-scale agricultures***

There is a wide gamut of food security policies that should be analyzed in light of the situation in each country, to respond to the current scenario of recession and price volatility. However, the local economic, biological, and climate conditions are such that this volatility is expected to increase, causing uncertainty for producers and threatening food shortages for the consumer (see Section III). From a policy and institutional standpoint, the response should focus on a combination of policy instruments in the production, trade, and social arenas that will improve public investment in rural areas.

Strengthening small- and medium-scale agriculture with scarce assets could help mitigate problems of food insecurity and contribute to reducing poverty. This will require a revision of agricultural policies, instruments, and institutions. There are outstanding cases in the region, in countries such as Brazil, Chile, and Argentina (see Box 17).

### ***Investing in social goods and strengthening competition and consumer protection policies***

To deal with the problem of the growing concentration of global value chains (GVC) in the agro-food sector in LAC, public policies should take into account the following factors: i) investment in social goods such as research and innovation, agricultural health, development of infrastructure, and stronger technical and health regulations; ii) facilitating the insertion of local agents with greater potential, through programs to promote production

36 The Inter-Agency Group on Rural Development is made up of FAO, IICA, ECLAC, IDB, World Bank, IFAD, USAID, GTZ, and AECID.

37 This program was proposed in 2008 by the governments of Spain, Mexico, Colombia, Peru, Bolivia, Costa Rica, and Panama, and later was joined by Guatemala, El Salvador, Chile, and Brazil

chains, suppliers' markets, and skilled labor; and iii) seeking out and consolidating new local and international markets. All of these activities should be developed jointly by a wide gamut of organizations, and require a strengthened regulatory framework and revision of both "isolated" sectoral policies and their management.

Although most countries in the region have legislation on competition policies and consumer protection policies, institutions should be strengthened and civil society should be educated, with special attention to the weakest links in the GVC, such as agricultural products and consumers, so that this type of policy is viewed as part of a new instrument for dealing with major concentrations and anti-competitive practices.

### *Promoting land markets with a regulatory framework and greater transparency*

Because of its resources, LAC attracts investors and it could provide an opportunity for developing countries to channel more investments to rural areas. However, speculation on the land market and its unrestricted acquisition by foreign interests can exacerbate the crisis and favor concentration.

To prevent this, inclusive development should be promoted, through land use planning processes, policies to promote chains of major agro-food consortiums with local suppliers, and development of incentives to facilitate the transfer of know-how to local agents.

In addition, environmental standards related to consumption of carbon and the zero carbon initiative could in the near future modify decisions as to where to produce and how to reduce the carbon footprint in production processes and international logistics. This could eventually influence decisions on innovations in production systems and investments in land purchases, that give preference to nearby markets.

## **Box 19:** A code of conduct for direct foreign investment in agriculture

In view of the appropriation of land by foreign interests, IFPRI has proposed a code of conduct to promote greater transparency in negotiations, respect for existing land rights, increased benefits for local communities, a commitment to sustainable development, and adherence to national and international policies, especially as regards food security.

**Source:** [www.business-standart.com](http://www.business-standart.com).  
Consulted May 2009.

### *Institutional framework that manages and integrates production systems*

A reading of the sectoral chapters and what is happening in the rural world show the need for new institutional arrangements to favor an integrated management of production systems and the territory. In most countries in the region, fisheries, forestry, livestock, agriculture, and other productive sectors are managed separately, because policies have been designed on a sectoral and centralized basis, and also because of the limitations of the legal framework and the rigidity of organizations.

Specifically, fisheries and forestry have been low of the list of public policy priorities, and this trend should be reversed for various reasons, such as: i) economic inefficiency; ii) environmental impact; iii) the need for an integral regulatory framework; and, iv) the growing participation of new civil society groups.

In view of the need for integrated territorial management, and given the situation of scarce, deteriorating natural resources, it is necessary to

promote land use planning, defined as use of the land according to its capacities for use, taking into account the growth and mobility of the population on land that has a minimum of political, sociocultural, and biophysical characteristics (Campos, 2009).

This new institutional framework should be part of an integrated process of spaces, policies, agents, and markets, and could eventually become a program to manage multiple policy instruments and coordinate organizations linked to development.

## ● **Conclusion**

There is an ongoing process of change in the institutional framework for agriculture and rural development. In some countries of the region, the process has been deliberate and planned, as seen in land use management activities in Brazil and Mexico, but in most countries changes have been related to specific issues and dependent on international standards. In any event, there are new rules of the game, changes in the legal framework and organizations, and new ways of working that favor concerted action, decentralization, and the participation of new actors from civil society.

New laws and institutional arrangements are emerging to handle problems related to food security. Attention to small- and medium-scale agriculture with scarce assets has fostered integral institutional reform in countries such as Brazil, Chile, and Argentina, to develop a broader, multisectoral approach to agriculture.

Lessons learned show that there is a need for analysis based on an integral approach, a working agenda, and its use by decision-makers.

It is important to bear in mind that an analysis of market structures in key agro-food chains in the region has shown a growing concentration in links where there is greater integration between value and know-how, and in those corresponding to logistics and distribution. However, the various stakeholders are dispersed, and are generally small relatively disorganized producers and consumers, with little negotiating skills or power. Practices limiting competition are seen increasingly in the agrifood sector.

Thus, attention must be drawn to a phenomenon in the region that has been observed with increasing frequency, namely, the appropriation of land, through acquisitions by states and multinationals, thereby adding a factor for potential conflict in rural areas.



## **III Special Section: Price volatility in its agricultural and rural context**



## *Price volatility in its agricultural and rural context*

Uncertainty over prices of raw materials will continue in the coming years



- An increase in net imports of agricultural products for human consumption is predicted in developing countries, due to the inability of supply to meet the increasing demand expected as a result of the increase in population, urbanization, and purchasing power.
- The price of petroleum will be critical to the evolution of agricultural prices in the next decade. Prices of more than US\$90-100 per barrel will trigger significant increases in agricultural prices, not only as a result of increased costs, but also due to increased demand for raw materials to produce biofuels.
- The rapid expansion of biofuel production to fulfill policy mandates is expected to continue its upward pressure on prices of raw materials, such as corn, wheat, oilseeds, and sugar.
- Stocks are expected to recover, after the low levels observed in recent years. In the case of grains, the ratio of stock to consumption is projected to approach 30% for grains and 22% for rice, which should help prevent upward price movements.

**Source:** OECD-FAO. 2009, Agricultural Outlook 2009-2018.

### • Introduction

The events of recent years have pointed to the importance of managing social and economic risks linked to the instability of agricultural markets. Consequently, this special section is devoted to the subject of price volatility. The section is divided into three chapters, to discuss this problem from different angles, regarded as complementary: a) the present introduction to the issue of volatility in its agricultural and rural context; b) price transmission or pass-through from international markets to national markets, where the results of two case studies are presented, one referring to agricultural products, and the other to agricultural income; and, c) policy options to counter volatility and mitigate its negative effects.

The significant increase in raw material prices during 2007-2008 opened the way for a possible global food crisis. The most evident manifestation was an accelerated rise in food prices, over and above prices for other items. ECLAC estimates that this price spike prevented approximately 11 million persons from moving out of poverty and a similar number from rising above the indigence level. (ECLAC, 2008c). The later economic crisis which erupted in the second half of 2009 is jeopardizing progress in meeting the Millennium Development Goals for reduction of poverty and hunger.

In response, the United Nations Secretary General set up a set up a high-level working group, organized a high-level conference on global food security, and initiated a debate on “a new global food policy

agreement” at the G-8 Summit held in Hokkaido, Japan in July 2008. These are all notable examples of initiatives taken at the highest level to discuss the implications of price increases on food security.

### ***The reasons for volatility: explaining it from a theoretical standpoint***

Volatility is: a phenomenon related to the variability of rates of change in prices over time. It therefore involves velocity, magnitude, and directional changes in price variation rates. The greater the rate of change, either upward or downward, the more volatile the price, the more rapid the change, and the more changes in the direction of the variations. Price stability depends on the elasticity of supply and demand. In the case of supply variations, the higher the demand elasticity, the smaller the change in the equilibrium price. On the contrary, if demand is highly inelastic, small variations in supply have a major impact on prices. Similarly, if supply is relatively inelastic, variations in demand cause sharp changes in the equilibrium price.

Volatility operates at all geographical levels (international, national, regional, and local), but the factors determining the price vary at each level, as the conditions on the higher levels determine those on the lower levels:

- i) on an international level, prices are determined on the basis of the global laws of supply and demand that operate according to the structure of each market;
- ii) on a national level, in addition to international factors, there are two elements that determine price volatility: first, the variation in the relative value of the national currency in relation to the principal currencies of international trade;<sup>38</sup> and second, the existence of price-setting schemes that substitute for or restrict the market operation;
- iii) on regional and local levels, the additional factors determining prices are market

structures, which determine the trade relations and the equilibrium on different markets.

In the case of prices of agricultural products, the main reason for volatility is the low elasticity of short-term production and consumption (Gilbert, 2004). On the production side, the velocity of the response is determined by producers’ decisions regarding use of inputs and how much to plant, which are usually made on the basis of price expectations. Thus they can determine a very large production or a very small output, in comparison with demand and storage or warehousing possibilities (when such possibilities exist). To this is added the effects of climate variability and extreme weather events (e.g., droughts, floods, or freezes), inherent in agricultural production and generally difficult to predict, as well as trade restrictions, that can trigger a sudden drop in the supply of products on the market.

On the consumption side, demand elasticity is generally low, in terms of both price and income. In recent years, two factors that have increased demand for agricultural raw materials have also been present in market operations: a) increased demand of emerging countries, due to the greater purchasing power of their consumers; and b) an increase in the demand for some raw materials to produce biofuels (especially corn and oilseeds).

Although there is no consensus in academic circles, another reason advanced is the effect of increased speculative demand for financial instruments on commodity markets, including agricultural products, that some authors attribute to the United States monetary policy and the search for safer financial instruments, following the risky subprime mortgage crisis, that began to affect the U.S. financial system in the second half of 2007 (Calvo, 2008; Frankel 2008a y 2008b).

A last factor influencing prices is the level of inventory. Since the response capacity of supply is low and demand elasticity is also low, an increase in demand in the short run causes a temporary imbalance on the market, which is reflected in

38 Primarily in US\$. Recently, some emerging countries have begun to question the role of these currencies and have started a move to promote the creation of a new international currency, managed by the IMF, to replace US dollars as the basis for the exchange rate and in establishing reserves.



a reduction in inventory, to cover the increased demand not met by the supply, and to protect the already existing demand for human consumption. Low inventory levels ultimately reduce the market's capacity to rebalance the supply shortage, a situation that leads to an increase in prices, and indirectly promotes speculative behavior on the part of wholesalers and financial agents. FAO (2006e) and Rodríguez (2008) have identified a direct relationship between the level of inventories and the prices of agricultural products.

Finally, agricultural raw materials are also closely related to the cost of energy. Energy and agricultural markets have traditionally shown two links: a) the direct relationship between energy costs and agricultural production costs, if energy is considered as an input, and the indirect relationship between the two due to the impact on the cost of inputs, such as fertilizers; and b) the effect of transportation costs (i.e., freight charges). More recently, a new link has been created, based on the increase in the demand for some agricultural raw materials to produce biofuels, and this has strengthened the direct link between the prices of the two groups of raw materials. These interrelationships closely link the prices of agricultural and energy products, making it difficult to separate the behavior of the two groups of raw materials (Zoellick, 2008).

To the foregoing is added an autonomous of volatility, that consists of two main elements: first, volatility associated with climate change, due to the impact of the increased frequency of extreme climate events on the food supply; and, second, volatility based on fluctuating expectations on financial markets, that is transmitted to agricultural raw material prices (and ultimately to food prices), through the impact on purchase orders.

The combination of these types of phenomena can cause short-term imbalances or distortions on the market, the size of which will depend on their magnitude and duration. Moreover, the imbalances are not only on the supply side, as was

traditionally the case with agricultural products, but are also caused by changes in demand. The concurrence of elements related to both supply and demand in the increased prices of agricultural raw materials and their volatility in recent years has led to the possibility that we are dealing with a new supply and demand adjustment cycle, like the one that occurred at the end of the 19th and beginning of the 20th century, and between 1945 and 1970

## • Recent evolution of volatility

### *2008 a year of extreme volatility*

The historic price levels since the early 1960s show that changes in direction of commodity prices are frequent. They also show that periods of growth in real prices tend not to last as long as periods of a downward price trend (prices do not perform in nominal terms) (Figure 6).

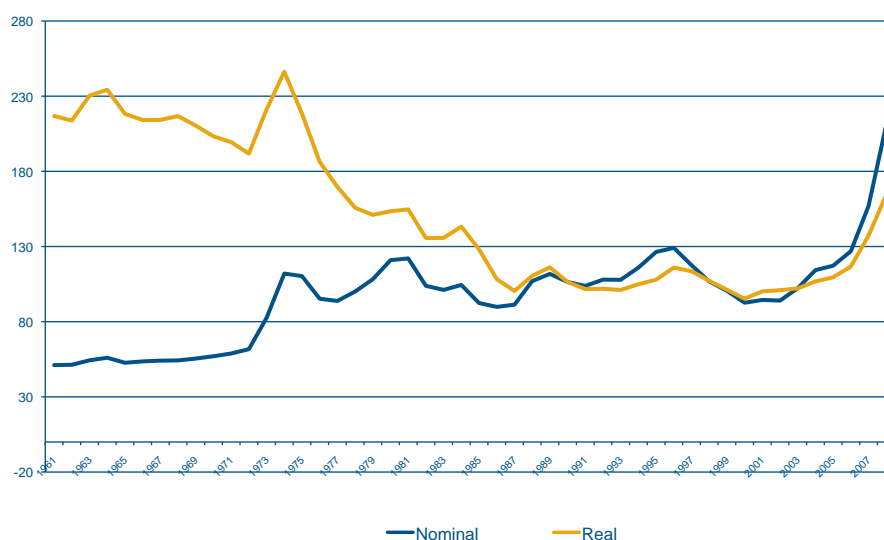
Considering prices in real terms, from 1961 to 2008, two major rapid growth periods were identified: 1973-74, and 2007-2008 (FAO, 2008f).

In addition, analyses of volatility performed for this report,<sup>39</sup> on the basis of annual volatility measures computed on monthly prices (UDA/ECLAC, 2009), identified the 1970-75 and 2005-08 periods (Figure 7) and the years 1974 and 2008 as the times of greatest volatility since 1960.

The increased prices and volatility in the second period were related to structural factors (e.g.: increase in the world population, increase in per capita food consumption, and reduction in the supply of the main factors of production, such as land and water, among others); cyclical factors (e.g. increase in energy prices, extreme weather events, and increased financial speculation); and, deliberate policy decisions (e.g. restrictions on exports and subsidies for biofuel production).

<sup>39</sup> Volatility is defined as variability in the rates of change in prices, measured as the standard deviation of monthly rates of change during yearly periods (e.g. Jacks et al., 2009). In addition, monthly price indices are computed in real terms and were deflated using the United States Producer Price Index (All Commodities Producer Price Index) (e.g. Gilbert, 2006).

**Figure 6.** FAO Food Price Index  
(1998-2000=100)



**Source:** FAO (2008f) based on FAO data.

The notable price increase in the first half of 2008, followed by the drop in the second half of the year, were the factors that made 2008 a year of extreme volatility. The price drop leveled off towards the end of 2008 and early 2009, and since then the trend has been upward. Moreover, the volatility from January to May 2009 was less than in 2008, although it was above historic levels.

By May 2009, all price indices<sup>40</sup> (except for fibers and wood) had already exceeded their December 2008 levels, between 12.2% (index for all groups) and 40.0% (index for petroleum), showing an upward trend that first became apparent in the first quarter, and was greater for petroleum, oil, and oilseed indices (for details, see Table 4).

Another phenomenon that would be interesting to determine is whether there is a difference in price volatility depending on whether the trend is upward or downward. Studies performed<sup>41</sup> using monthly values on real price indices show that the volatility indicator can be high (or low) both in periods of

upward prices (from a minimum to a maximum) and in periods of a downward trend (from maximum to minimum). What is clear is that the greatest volatility is seen for short period of time, usually less than 15 months, during which prices move from minimum to maximum and maximum to minimum levels.

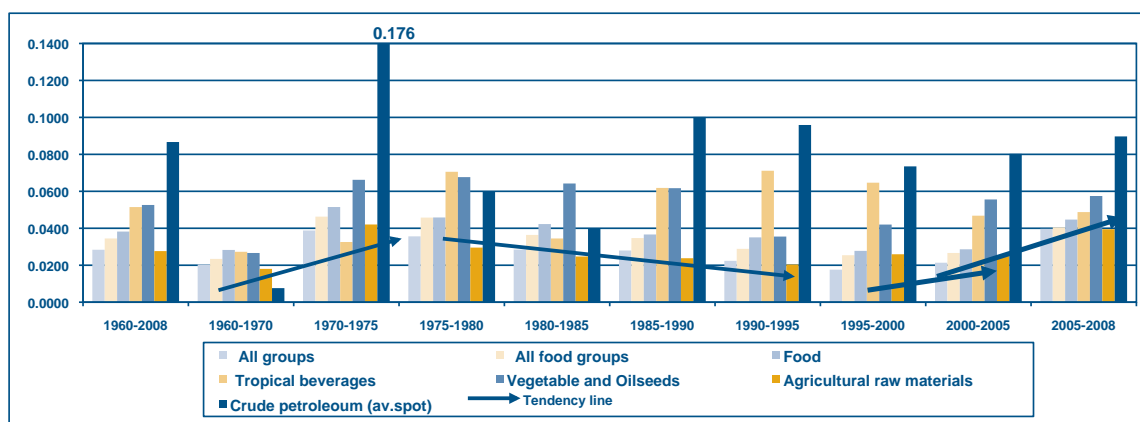
The highest levels of volatility have been seen: a) in the period preceding the 1974 rise (except for tropical drinks); b) in the subsequent drop following that increase (except for tropical drinks and petroleum); and c) in the drop in the last half of 2008 (except for tropical drinks and food).

Moreover, in the indices for foods, tropical drinks, and petroleum, the average of the volatility indices for the upward periods is greater than the average for the downward trends. It is also noteworthy that in the indices for tropical drinks and petroleum, the volatility of the positive rate changes is significantly greater (in statistical terms) than the volatility of the negative rate changes.

<sup>40</sup> For the purpose of analysis, UNCTAD price indices in real terms were used.

<sup>41</sup> For this analysis, in the series of price indices, the maximum and minimum values associated with significant changes in trends were identified.

**Figure 7.** Volatility of Real Price Indices for Raw Materials (1960-2008, by subperiods and groups of products)



**Source:** UDA/ECLAC, based on UNCTAD data.

Finally, we note that the volatility of all the indices in the past year (May 2008-May 2009) is greater than in the past five years (May 2005-May 2009), and very similar to indices for food

and tropical beverages. It is also significantly greater (except for tropical beverages) than the average volatility for the entire period of January 1960-May 2009).

**Table 4.** Indicators of the Evolution of Raw Material Price Indices (in real terms) (Percentages, January 2008 – May 2009).

	Max. 2008	Prom 2009/ Prom 2005	Prom 2009/ Prom 2008	May 2009/ May 2008	Prom 2009/ Max 2008	May 2009/ Dec. 2008
All groups	April	129,6%	86,0%	81,6%	73,9%	112,6%
Food	April	151,7%	99,7%	90,9%	83,4%	113,9%
Tropical beverages	February	124,0%	105,8%	114,0%	95,1%	117,1%
Vegetable oils and oilseeds	March	133,5%	76,4%	76,6%	61,9%	136,8%
Fibers and wood	February	97,8%	77,4%	74,2%	71,8%	96,8%
Minerals and metals	March	112,6%	71,0%	69,4%	60,2%	110,7%
Crude petroleum	June	84,1%	56,2%	54,7%	43,4%	140,5%

Prom = Average value of the corresponding price index.  
Max 2008 = Maximum value of the price index in 2008.

**Source:** UDA/ECLAC, based on UNCTAD data.

- **The outlook**

*Agricultural prices are forecast to be highly volatile in the coming years.*

As we have mentioned, the rise in prices has been caused by a series of short-, medium-, and long-term factors. The relative weight of each of these factors is still not known, and there is a lively debate among analysts that has still not led to a definitive agreement on this issue. What most studies do agree on is that the variations were determined by the combined effect of a series of factors, whose duration depends on their nature. In some cases, the factors will have a constant or increasing impact over time; this is the case with the increase in population and in the purchasing power of important segments of the population in emerging economies.

Consequently, real prices of agricultural products are estimated to be 10-20% higher in the next decade than in the 1997-2006 period (FAO-OECD, 2009). Similarly, short-term factors are expected to continue having temporary effects, and the low elasticity of supply and demand will tend to be exacerbated, producing rapid and large price variations. This will keep volatility at a high level.

The volatility of agricultural prices is forecast to remain high in the coming years, due above all to the fact that the only response, with a lag, to market pressure will be on the supply side, without any possibility of structural changes capable of mitigating the effects of peaks in demand (FAO-OECD, 2009). In this scenario, it should be noted that during the past two decades, a reduction in productivity growth rates has been observed, especially in the case of grains. This decline has been linked to the declining investment in scientific and technological research in agriculture that has been observed since the 1980s.<sup>42</sup> This phenomenon will have a long-term impact, since the development and adoption of new seed varieties and technological developments in general are processes that take years.

Projections on the evolution of prices, however, should be viewed with caution, since as any economic forecast, they are subject to a series of initial conditions and assumptions on the behavior of other relevant variables in the future (e.g., evolution of petroleum prices and changes in consumption patterns).

***Economic effects:***

- *Increased uncertainty will discourage private investment in the agricultural sector*

The increase in prices of agricultural raw materials recorded in recent years triggered a rise in private investment to step up production. Especially during the 2007-2008 period, many farmers invested to speed up their productive systems and thereby take advantage of the high commodity prices. This process took place in an international context of high prices for energy and agricultural inputs. The farmers' investment ultimately had high costs, only justified economically by the high price of the expected sale. Investment in fixed capital also had a multi-annual perspective.

The subsequent drop in prices seen from mid-2008 onwards found the most dynamic farmers, the ones who ventured to invest to take advantage of the high prices, with a relatively heavy short- and long-term debt, thus increasing the risk of their enterprises' going bankrupt. Compounding this situation was a decline in available credit, due to the financial crisis.

These factors, together with the disincentive to investment due to heightened uncertainty, will have a negative impact on future prospects for private investment in the agricultural sector. A reduction in investment, during a time of increased demand, can produce serious imbalances that could cause prices to shoot up again and increase volatility even more, with unpredictable effects on the future availability of food and food security, to boot.

<sup>42</sup> See Section I for more details (Sectoral context and Agricultural Sector).

- *High volatility affects countries with undiversified agricultural exports*

The high volatility on agricultural commodity markets also has important economic implications for countries with export economies where they are an important source of foreign exchange. A recent study (Jacks et al., 2009) shows that developing countries have experienced much greater volatility in their terms of trade than developed countries, and that in the case of Latin America, it has been up to three times higher. It also presents empirical evidence—based on price series with data since the 18th century—that the volatility of those prices has always been greater than for prices of manufactures.

This being the case, the dependence by these countries on the export of a few commodities, whose prices have always been more volatile than the prices of their imports, is a key cause of instability in their terms of trade and ultimately, of their exposure to greater economic vulnerability.

### ***Social effects***

- *A sharp increase in the prices of basic foods would limit the ability of the poorest to acquire adequate food rations*

The social impact of price volatility depends on the vulnerability to food insecurity and the characteristics of households. Poor and indigent households spend a large proportion of their income (50-80%) on food. A sudden rise in commodity prices can make it impossible for them to acquire adequate food rations to be healthy or it can reduce the consumption of other goods in order to maintain food expenditures at the same level.

The effects on poor households also depend on income sources. Net food consumers would be more affected by increased prices than net producers. Net producers could even benefit

from a price increase, if their production costs do not rise more than the prices of the products sold. But, small producers often have very little negotiating capacity to take advantage of positive market conditions. Chapter 2 of this section presents a study that endeavors to analyze the effects of price variations on the income of farmers in Latin America.

The social effects resulting from price volatility are difficult to analyze, due to the limited information available and the complexity of mitigation strategies and implications for households.

### ***Various factors influence price transmission***

The variations of international prices are not transmitted immediately to local levels. The local price depends on a series of factors, and especially: a) the level of the dependence of the domestic market on imports and exports; b) the degree of distortion on the domestic market for the product, and domestic competition, transaction costs, the presence of monopolies or oligopolies, processing and marketing; c) the trade policies of the countries, including tariffs and import or export quotas; and, d) changes in the exchange rate, that can reverse the advisability of importing or exporting (Paz and Benavides, 2008). The economic and social effects of price volatility will depend to a great extent on the characteristics of the local markets. The issue of price transmission, due to its differential impact depending on the local socioeconomic situation, is discussed separately in Chapter 2 of this section, in regard to the rice and corn markets.

### ***Governments should manage volatility***

Good government decisions in managing volatility are critical to countries. There is a wide gamut of policy instruments available for this, and the possibility and capacity of countries

to use it varies, depending on their institutional development and technical capacity, as well as on commitments undertaken in international agreements vis-à-vis the nature of the instruments. Moreover, the validity of the instruments also varies, depending on the type of distortions they cause. Governments should play a direct role in designing and implementing effective instruments

to deal with the negative impact of price volatility and the economic uncertainty facing producers and consumers. Chapter 3 of this special section discusses this subject and presents policy options that various countries, with different strengths and exposed to different social and economic risks, can implement, with the benefit of lessons learned in diverse situations.





## ***Transmission of international prices to national markets***

The sharp variations in commodity prices that have occurred in the past two years on the world market have touched off different emergency reactions by Latin American governments, especially in their upward phase, to contain or mitigate their impact on national consumers, and especially the poorest. Although most commodity prices began to come down on the international market in the second half of 2008, agricultural prices are expected to remain at higher levels than in the first part of this decade. These international price trends were not immediately or totally reflected in the domestic markets of countries, due to the well-known lag in price transmission between the two markets. This behavior is repeated on internal markets, since price pass-through has varied among the different levels of the retailer, wholesaler, local markets, and harvest at the farm.

How much of the sharp increase in the prices of various agricultural products in 2007 and 2008 (especially grains and oilseeds) was actually passed through to producers? Did they benefit from the price increases on the international market?

Both ECLAC and IICA have done studies on this, not only to confirm price pass-through to domestic markets, but also to analyze its possible impact on the farm income of small producers in the region. While ECLAC focused on transmission of international prices to local markets for selected products, IICA analyzed what happened with farm income in the past two years in selected territories of Latin American countries.

Even though the institutions used different methodologies, and the results of the two studies are not comparable, they represent an important contribution to understanding the impact of variations in international prices of the region's agricultural products. The main findings of the two studies are presented below.

### **A. Transmission of prices on the corn and rice markets of eight latin american countries<sup>43</sup>**

#### ***Introduction***

ECLAC's Agricultural Development Unit—with the support of French Cooperation and Swedish Cooperation—developed a study in the first half of 2009, to obtain empirical evidence on three related phenomena: a) whether there is price pass-through or transmission (i.e., to what extent movements in international prices are reflected in the evolution of national prices); b) the speed at which pass-through occurs, in the event it does exist; c) whether there are cases in which pass-through is asymmetrical (i.e., a difference in transmission depending on whether international prices were rising or falling).

The study covered Brazil, Chile, Costa Rica, Guatemala, El Salvador, Nicaragua, Panama, and Honduras. The yellow corn and rice markets were studied, and either wholesale or producer prices, or both, were considered, depending on the available data.

The products selected (corn and rice) share two characteristics that made them attractive from a research standpoint. First, both are considered as staple foods and are consumed worldwide, especially in lower-income countries, where they make up a large part of the diet in some cases. Second, they are relatively homogeneous products, and that facilitates their comparison among countries and markets. Moreover, the international price of both increased sharply in recent years. In the case of corn, the study worked with yellow corn, which is more important as an industrial input than as food for human consumption, as there are no international prices for white corn, which is consumed as food.

<sup>43</sup> This section is based on the results of a study on price pass-through conducted by ECLAC's Agricultural Development Unit (Dutoit et al., 2009). This study received financial support from French Cooperation and Swedish Cooperation.

As for the main results, we can say that the response of domestic prices to an international price shock shows that pass-through is stronger on wholesale markets than on producer markets. In addition, according to the study, the absence of price pass-through can be explained by a very powerful market in the case of wholesalers and by protectionist policies in the case of producers.

### *Conceptual and methodological aspects*

The conceptual framework of the study is the so-called “law of one price,” according to which the difference in the price of the same product between two, spatially separate markets is solely attributed to the cost of transportation between the two markets. If this condition is met, then the two markets are integrated and price pass-through is perfect. In reality, however, this condition is rarely met, due to various factors, such as use of the market’s power and excessive transaction costs.

To determine the extent of compliance with the law of one price, econometric methods are applied (co-integration methods and error correction models), to quantify to what degree the price is transmitted throughout the marketing chain and at what speed. These methods also make it possible to simulate the effect of an international price shock on domestic markets, using estimated ratios.

### *Certain prominent characteristics of the markets analyzed*

Economic policies evolved in a relatively similar fashion in the countries studied. More specifically three periods can be identified: a) active intervention by the governments of agricultural markets during the 1970s; b) a stage of stagnation and macroeconomic adjustment in the 1980s; and, c) open trade and regional integration policies from the 1990s to the present.

During the period covered by the research (since the mid-1990s), all of the countries studied were largely net importers of corn and rice. Only Brazil became a net exporter of corn, beginning in 2000.

The structures of the marketing chains for the two products can be divided into three groups: a) highly industrially concentrated markets with little government support for producers; b) markets where there is some type of agreement between producers and the industry, to define certain transaction components (prices or purchase periods, for instance); and, c) markets with government price control systems (e.g., minimum prices or price bands).

The rice markets in Chile, El Salvador, and Nicaragua, and the corn markets in Chile and Guatemala belong to the first group. The rice markets in Panama and Guatemala fall into the second category. The rice markets in Costa Rica and Honduras and the corn market in Honduras and Brazil belong to the last group. Since corn prices were not available in El Salvador and Nicaragua, they were not analyzed.

Two exceptions are the markets for corn in Panama and rice in Nicaragua. In the first case, producers are organized in associations and the government supports a program for processing, from basic grains to export products. In the second case, some of the producers are signatories to a negotiation agreement they established, through the Rice Production Support Program (PAPA), with the industry, while the rest negotiate directly with industry.

### *Summary of the principal results<sup>44</sup>*

**Costa Rica.** Only wholesale prices are integrated with international prices, for both corn and rice. On the corn market, pass-through appears to be relatively complete, but not in the case of rice. The greater pass-through on the corn market may be related to the fact that production and consumption

<sup>44</sup> Table 5 presents a summary of the econometric estimates.

of corn in Costa Rica has been declining, while imports have increased, which shows that wholesalers rely increasingly on the international market to supply their market, which is in turn smaller. On the rice market, no evidence of price pass-through to producers was found, and evidence of transmission to wholesalers was weak (both long-term elasticity and the velocity of adjustment are low). These results may be due to the fact that the price to producers is fixed by a mechanism in which the government and producers participate.

**Guatemala.** It was not possible to perform an analysis, since both the corn and the rice price series followed a seasonal behavior. This means that their evolution did not meet the nonseasonal requirements imposed for this econometric analysis. However, this does not mean that there is no price pass-through. It just means that this cannot be determined by applying the conventional econometric methods used to analyze price pass-through.

**El Salvador.** The results show that there is price transmission to the domestic rice market from the Thai market, but not from the United States market. This seems contradictory, since there is no direct trade relationship with the Thai market, but there is with the U.S. market. The result, however, is interesting, since the Thai market price is considered as the international benchmark price.

**Nicaragua.** On the rice market, there is evidence of price transmission to the producer, from both the Thai and the U.S. markets. Moreover, on the wholesale market, the price adjusted almost immediately following changes in the international price. In the case of the price to the producer, however, the pass-through effect is very strong. These results can be attributed to price fixing under the PAPA program which probably prevents a greater price pass-through.

**Panama.** There was no evidence of price transmission found on the wholesale market for rice. However, there was strong evidence of price transmission to

producers on the corn market, where the velocity of adjustment was high.

**Honduras.** On the rice market, there was evidence of pass-through between the Thai price and wholesale and producer prices. When the relationship with the U.S. price was analyzed, integration with the producer price was the only finding.

**Chile.** On the corn market, there was price transmission with both the United States and Argentina. Like Costa Rica, the considerable pass-through on this market can be explained by the high percentage of imports out of total consumption in the country (50%).

**Brazil.** All of the domestic markets are integrated with international ones, except in the case of the price of corn to the producer.

**Response to price shocks.** Simulations were also conducted to determine the speed of the response of domestic prices to an international price shock.<sup>45</sup>

On the corn market in all of the countries, with the exception of Costa Rica, equilibrium was restored in approximately 10 months. In the case of rice, the results showed that on the wholesale market, the response of the Brazilian price to a shock in Uruguay was rather slow, while in Costa Rica, after a shock in the price in Thailand, the domestic price was still fluctuating 24 months later. Although oscillations lost strength over time, stability was never restored on the market. It is also important to point out that the evolution of the producer price in Honduras to a new equilibrium has been relatively sinuous since the shock in the Thai price (i.e., the international benchmark). Nonetheless, equilibrium was achieved after some 23 months.

The simulations made it possible to determine that rice seems to benefit from more complete price transmission than corn, since all of the rice price series achieved a higher new equilibrium. Moreover, after a shock in the international price on both markets, wholesale prices achieved a

<sup>45</sup> The magnitude of the shock was twice the value of the standard deviation of each of the price series, which in most cases corresponded to the greater price variations that occurred during the 2007-2008 price boom.

higher equilibrium than producer prices. In other words, price pass-through seems more complete on wholesale markets, a reasonable result, since there is an additional link in the price transmission change between wholesale and consumer prices.

**Asymmetry.** The results show that asymmetry in price pass-through was found only in the Nicaragua vs. Thailand price pairs for wholesale rice, and the Brazil vs. Argentina pricing, also for wholesale rice. In these cases, the trend toward equilibrium was slower when the variance was positive than when it was negative. In other words, prices adjust more rapidly when there is a downward trend on international markets.

Since no evidence of asymmetry was found in the analysis of other price relationships, we can say that in most of the markets studied, a positive deviation in equilibrium is adjusted in the same way as a negative one. In other words, there is no evidence that price transmission is asymmetrical.

### *Conclusions*

Results show that the rice market in Central America is related to the Thai market, a situation that can be explained by the influence that market has over the United States, since Thailand is the market that sets the international benchmark price for rice.

In Brazil, wholesale and producer rice markets are integrated with the markets of Argentina and Uruguay. This is consistent with the fact that most imports come from those two countries.

For corn, Panama (producer) and Costa Rica (wholesaler) evidenced a high adjustment velocity, especially in Panama, where greater elasticity was identified. Moreover, the wholesale markets in Chile and Brazil are integrated with the U.S. and Argentine markets.

The results as a whole also reveal that Brazil has greater price pass-through on the rice market. This is also true of the corn market in Chile. Among the

Central American markets, no country stands out as having particularly strong or weak integration.

Simulations of the response of domestic prices to an international price shock show that transmission is stronger on wholesale markets and on producer markets. It also appears that transmission is more complete on the rice market than on the market for corn.

In the vast majority of the cases, the absence of price transmission can be attributed to two basic factors: a) a powerful wholesale market; b) and, protectionist policies targeting producers (price setting, for example). Both factors limit the integration of markets.

Therefore, measures designed to promote competition throughout the marketing chain and to reduce distortions on markets should contribute to better price pass-through, from international markets to local markets.

However, although price pass-through allows for a good allocation of resources in the long run, in the short run, it can also mean that international price volatility is passed on to producers.

For farmers, this means: first, a great deal of insecurity in their income; and second, a more complicated decision-making process, since assessing the estimated income for each type of agricultural product becomes highly imprecise. Moreover, in the case of strong volatility, it is possible that farmers prefer to produce products that are less profitable but safer, to protect against volatility. In the extreme, they could be forced to shift to subsistence farming, more isolated from the market, in order to protect themselves from the risk linked to price volatility.

Consequently, we have to wonder whether price transmission is always desirable and whether it is a goal governments should pursue. In other words: Does agriculture have characteristics that are compatible with free competition between the domestic and international markets, that allow for a good price pass-through?

**Table 5.** Summary of the principal results of econometric estimates

Rice, wholesale price	Transmission				
	Transmission exists	With	Strong evidence	Long-term elasticity ( $\beta$ )*	Velocity of adjustment**
Costa Rica	Yes	Thailand U.S.	No No	<0,5 <0,5	Low Low
Guatemala	not studied				
El Salvador	Yes	Thailand	No	0,5-1	High
Nicaragua	Yes	Thailand	No	0,5-1	High
Panama	No				
Honduras	Yes	Thailand	No	0,5-1	Low
Chile	not studied				
Brazil	Yes	Argentina Uruguay	Yes No	0,5-1 >1	Low Low

Rice, producer price	Transmission				
	Transmission exists	With	Strong evidence	Long-term elasticity ( $\beta$ )*	Velocity of adjustment**
Costa Rica	not studied				
Nicaragua	Yes	Thailand U.S.	No Yes	<0,5 <0,5	Low Low
Panama	not studied				
Honduras	Yes	Thailand U.S.	No Yes	<0,5 <0,5	Low Low
Brazil	Yes	Argentina Uruguay	No No	0,5-1 0,5-1	Low Low

Corn, wholesale price	Transmission				
	Transmission exists	With	Strong evidence	Long-term elasticity ( $\beta$ )*	Velocity of adjustment**
Costa Rica	Yes	U.S.	No	>1	High
Guatemala	not studied				
Panama	not studied				
Chile	Yes	U.S. Argentina	Yes No	0,5-1 0,5-1	Low Low
Brazil	Yes	U.S. Argentina	No No	0,5-1 0,5-1	Low Low

Corn, producer price	Transmisión				
	Existe transmisión	Con	Evidencia fuerte	Elasticidad de largo Plazo ( $\beta$ )*	Velocidad de ajuste**
Panama	Yes	U.S.	Yes	<0,5	High
Brazil	not studied				

\* <0.5 means that  $\beta$  is between 0 and 0.5; 0.5-1 means that  $\beta$  is between 0.5 and 1; > 1 means that  $\beta$  is greater than 1.

\*\* A low adjustment velocity means that  $\alpha$  is below -0.5. A high velocity means that it is above that.

Note:  $\alpha$  represents the percentage at which the domestic price is adjusted in the current period, as a response to variations in the long-term equilibrium ratio between the domestic prices and the international price.

## B. A look at agricultural income in rural areas of four Latin American countries<sup>46</sup>

### *Introduction*

The concern of governments and international institutions over the accelerated increase (and subsequent drop) in international agricultural prices has focused on the impact of these price variations on the security of the population, primarily the lowest-income segments located in the least developed countries. However, little has been said about their possible impact on farm producers or workers and small businessmen who depend on agriculture to sell their services--especially since this is a population group that generally includes a large proportion of the poorest people in developing countries. Moreover, the geographical impact of price increases within a country can be highly diverse, since it will depend on the situation in different rural areas related to the type of production and the characteristic of the farmers. In view of the diversity among regions and types of producers within the same country, it is also important to study what has happened with the income of farmers and how much has reached the hands of the producers in different regions of the countries.

### *Objective*

In this context, IICA included in its 2008 work program a project involving studies in various regions of Latin American countries to estimate the possible impact of variations in the international market prices of agricultural products and inputs on the income of the factors of production for the principal crops in selected areas, with an emphasis on small producers..

### *Justification*

In selecting the countries for the studies, the situation of the region as a net importer of basic foods was given priority, as was the availability of information to apply the selected methodology. Based on these criteria, two Central American countries, Costa Rica and El Salvador, and two Andean countries,

Ecuador and Peru, were selected. With each of these countries, territories that were representative of the different aspects of national agriculture, and that had a high proportion of small farmers, were chosen. Thus, in Peru and Ecuador, the selection of provinces was based on their representativeness of the geographical features of coastal, mountainous, and forested land, whereas in El Salvador and Costa Rica, the selection was based on the type of specialization and the commercial characteristics of their principal production (horticulture, basic grains, tubers, and livestock). In all cases, the total selected production accounts for over 80% of the agricultural production in the territory in question.

### *Methodological aspects*

To measure variations in income of factors of production in the agricultural sector, it is necessary to visualize the changes that occurred both in gross income or the value of production sales per hectare for each of the products selected, as well as in the production costs per hectare, and especially the component of direct material inputs that were also affected by the evolution of domestic prices. What we want to assess is the change in the value added per hectare as a result of the change in the prices of agricultural products and inputs. To do this, wages and the cost of services (extension, fumigation, health, transportation, and other similar ones) are part of the value added by agricultural production that is distributed to the factors of production that made it possible (wages to labor, fees for services, rents or income from the land, financial interest, capital gains).

For this we used cost structure information provided by the Ministries of Agriculture, agricultural banks, and producer unions for each of the products studied. In view of the interest in focusing on the case of small producers, as a rule we used the nontechnified or intermediate level production costs. To obtain technical coefficients, measured by the percentage share of each of the inputs used in the direct cost of materials, we used the information on the most representative areas in each of the provinces where there was a concentration of small producers, to

<sup>46</sup> This section is based on the results of a study on international price transmission to agricultural income in rural areas, prepared by IICA as part of its work program.



determine an average technical coefficient for each of the products.

To measure “agricultural income,” we took the national accounting definition of “factor income” that refers to “the remuneration of all factors of production (land, capital, and labor) ... that represents the total value generated by a unit devoted to a productive activity.”<sup>47</sup> This measure is also the “net agricultural value added to the factor cost.” **Factor income** is the sum of the “remuneration of employees” (wages and other labor costs) and the “net earned surplus” (profits, land rent, net interest, and income from self-employment, among others). This definition does not take into account residence or location of the owners of the factors of production. And, it should not be confused with family income of farmers, the definition of which includes other sources of income, such as nonagricultural activities, rentals, and income transfers, in addition to income from agricultural activities.

Based on the information on the evolution of the domestic prices of the selected agricultural products and inputs and their respective input-product structures, it was possible to estimate the change in the net value added per hectare generated by the variations in said prices in recent years. To compute this, we used a variant of the “effective protection” formula, which makes it possible to measure changes in the value added in the production of a good, as a result of an increase in its price and in the prices of its inputs due to import tariffs (or export subsidies). In this case, the price increase was not caused by trade policy measures, but by transmission of international prices to domestic prices. The new formula is defined as:

$$\text{Index of VA} = (IP_i - \sum a_{ij} IP_j) / 1 - \sum a_{ij}$$

where  $IP_i$  is the price index of agricultural product “i”,  $a_{ij}$  is the coefficient of input “j” in the production value of product “i”,  $IP_j$  is the price index of put “j”, and  $(1 - \sum a_{ij})$  is the coefficient of the value added in production of product “i”. The indices are computed with the base year 2005= 1.00.

The estimate of changes in the net value added per hectare provides an indicator on the change in income of the various factors that intervene in the selected agricultural production. This includes both wages for labor, fees for services, land rents, financial interest, and capital gains or profits. In the case of small producers, some of these factors are concentrated in the farmer, who is both the owner and occupant of the land, provides his labor and that of his family, and finances part of the production costs. The “external” factors of production are usually required equipment or health services or farm production credits.

Finally, the resulting value added indices, which are computed at “current” prices, are deflated by the Consumer Price Index (CPI) of the country in question to adjust their values to changes in the purchasing power of the national currency and convert them into the “real” value added indices.

### *Summary of results*

The results of the estimates made in the 12 territories of the four countries selected, that include 54 observations involving 24 agricultural products, show that despite sharp increases in costs of material inputs, such as fertilizers and pesticides, a high percentage of the farm crops in these territories saw their “real” value added improve substantially in the past two years, and especially in 2008. Although in this last year production costs for 52 of the 54 crops selected (96% of the sampling) increased by over 40%, 44 of these crops had a larger margin of value added and in 23 cases, increases topped 40% of the average for 2004-05.

Moreover, the average increase in the direct costs of material inputs in the main products of the sampling was greater than the average increase in the domestic sales prices of the same products, and this difference was greater in exportable than in importable products (see Table 7). However, most of the products in the survey benefited from an increase in the value added per hectare.

<sup>47</sup> See Chapter IV: Indicators of agricultural income in EUROSTAT (1997).

**Table 6.** Prices, Costs and Value Added: Magnitude of change per product (2007-2008) (frequency of products with variations in comparison with the 2004-05 average)

Change of:	Δ Product prices		Δ Costs per product		Δ Value added	
	2007	2008	2007	2008	2007	2008
< 0%	9	4	1	0	15	10
0% - 40%	35	11	51	2	32	21
40% - 80%	10	19	2	23	7	17
80% - 120%	0	13	0	25	0	3
> 120%	0	7	0	4	0	3

**Source:** IICA estimates based on information from the Ministries of Agriculture, statistical institutes, and trade associations of Costa Rica, El Salvador, Ecuador, and Peru.

The products selected correspond to the primary crops in each of the territories, and generally account for over 80% of the corresponding agricultural production. As a whole, 48% of the sampling consists of crops that are competitive with imports (rice, white and yellow corn, wheat, and barley), 35% of crops for the domestic market (roots and tubers, cabbage, carrots, tomatoes, and milk), and 17% of exports (coffee, cocoa, bananas, plantains, sugar, and asparagus). The average prices for 2008 reveal an acceleration of international price transmission

to domestic markets in the countries studied, and a reversal of the price ratio between importable and exportable products on those markets. This last was possibly caused by the deterioration of the price ratio between tropical products (exportables for the countries in the sampling) and grains and oils (importables) on the international market. As a result, importable crops increased their average value added per hectare, while for exportable crops, it was reduced in comparison with the previous year.

**Table 7.** Index of Prices, Costs and Value Added by Crop Category

Category	Prices		Costs		Real Value Added	
	2007	2008	2007	2008	2007	2008
<b>Importables</b>	121,9	180,3	124,8	190,0	108,7	141,6
<b>Non-Tradables</b>	123,3	165,5	125,5	182,5	106,6	123,8
<b>Exportables</b>	137,0	148,4	116,3	166,8	136,6	126,6

**Source:** IICA estimates based on information from the Ministries of Agricultural, statistical institutes, and trade associations of Costa Rica and El Salvador.

Finally, the series of principal crops in the selected territories had a positive impact on the agricultural sector in 2008. The exception is Chalatenango in El Salvador, where a large vegetable production (cabbage and tomatoes) was hit with declining prices and sharply rising costs. In some of the most successful territories in terms of the increase in agricultural value added per hectare, their lead crops were products for the domestic market (non-tradables), such as white corn and potatoes

in Apurimac (Peru) and tubers and white corn in Upala-Guatuso-Los Chiles (Costa Rica). In Ecuador, crops of importable products (rice and soybeans) in Los Rios appear to have benefited the most from domestic price increases, but as a product mostly from the decline in output for climatic reasons. The highest value added per hectare for the principal products of this territory could have been partially offset by a smaller number of hectares planted or a lower yield than in the base year.

**Table 8.** Averages Indexes of Selected Cities  
(2004-05 = 100)

Provinces	Prices		Costs		Real value added	
	2007	2008	2007	2008	2007	2008
<i>Costa Rica</i>						
<b>Cartago</b>	126,6	213,0	129,8	200,2	110,7	147,9
<b>Upala-Guatuso-Los Chiles</b>	113,2	247,7	135,3	212,6	89,2	151
<i>Ecuador</i>						
<b>Chimborazo</b>	103,2	123,0	117,8	163,6	109,7	107,8
<b>El Oro</b>	126,1	148,8	111,7	150,9	144,2	151,4
<b>Los Rios</b>	118,4	216,6	114,4	186,4	119,1	204,7
<i>El Salvador</i>						
<b>Chalatenango</b>	111,0	131,1	122,7	156,2	101,0	93,8
<b>Usulután</b>	140,3	161,8	127,1	172,7	128,8	131,8
<b>Morazan</b>	137,3	163,7	127,0	169,1	127,5	132,0
<b>Santa Ana</b>	157,7	172,4	106,7	161,4	152,9	142,7
<i>Peru</i>						
<b>Apurimac</b>	122,1	197,5	125,1	202,6	108,9	165,7
<b>La Libertad</b>	111,7	154,4	121,1	192,9	100,2	103,1
<b>San Martín</b>	115,2	141,0	119,0	181,7	112,0	118,0

**Source:** IICA estimates based on information from the Ministries of Agricultural, statistical institutes, and trade associations of Costa Rica and El Salvador.

### *Conclusions*

The following conclusions can be drawn from the field studies conducted by IICA: (i) despite the fact that the price of agricultural inputs increased more than agricultural product prices, in most cases there was an increase in the value added generated by this production and greater income for the factors of agricultural production; (ii) the impact of international prices on agricultural

income was affected by many variables, including policy, market structure, production conditions, and climate, that are differentiated by countries, territories, and products; this makes it difficult to predict effects based on general characterizations; (iii) the need to establish methodologies to monitor these impacts as an element of information for defining agricultural and social support policies in the territories and for the producers affected by these market events.



# Policy options to deal with the volatility of food prices

## • Introduction

The international scenario of heightened uncertainty poses enormous challenges to agricultural production and food security for countries. Price volatility, which many analysts say will continue to rise, is now transmitted almost directly both to producers, making them more vulnerable to increasingly competitive markets, and to consumers, putting at risk the nutritional state of the most vulnerable groups, the poor, and especially children.

Countries are looking for ways to cope with the international price volatility they are exposed to, and they are implementing various policy instruments with a short-term impact, the effectiveness and efficiency of which are questionable. Moreover, the leeway available for policy design appears to be limited by the commitments signed under various free trade treaties and in the WTO.

One of the major challenges for countries is thus to optimize their policies in this current international situation and, in keeping with the socio-productive particularities of each country, to deal with short-term problems, but without neglecting the long-term perspective, and while taking into account the international commitments and budget restrictions of each country.

This article analyzes several policy instruments that either directly or indirectly help stabilize producers' income and the food purchasing power of the most vulnerable population.<sup>48</sup>

## • Policy instruments geared to producers

The risks inherent in the very nature of agricultural activity—climatic disasters and attacks of pests or diseases—are compounded by others that are increasingly menacing the sector's development. They include the volatility of raw material prices and exchange rate fluctuations, which make the income of farmers even more uncertain and inhibit their investment. To enable farmers to adapt to this complex scenario and to improve their productive performance, some countries have brought various instruments into play to manage risks and stabilize income. Some of these instruments are presented below.

### *Coverage programs*

In addition to the yield, the two factors that determine the gross income of producers are the price of the product and the exchange rate. There are coverage programs that go way back. For instance, the Chicago futures market has been providing mechanisms to cover price changes for both producers and consuming companies since 1848.

**Mexico**, to cope with price volatility stemming from free market reforms, introduced the Subprogram of Supports for Acquisition of Agricultural Price Coverage (SAACPA), to manage risks based on international price fluctuations through coverage on the futures market. At present, supports to

<sup>48</sup> In this article, with the exception of Box 20 that appears further on, trade policy instruments, such as import tariff reductions or export restrictions, are not analyzed, nor are price control policies that were used during the recent price escalation. An evaluation of this type of measures can be found in (FAO, 2008f). Also, price bands are not analyzed because of their limited applicability within the framework of WTO and the free trade treaties of various countries in the region, e.g., Chile, Central America, Colombia, and Peru, with the U.S., which contemplate their elimination over time. An analysis of this type of mechanisms can be found in Valdés and Cordeu (1993).

purchase price coverage are still granted as one of the components of the program to deal with structural problems (compensatory support payments). These payments go to producers and sellers, and cover a wide range of products, including corn, wheat, sorghum, soybeans, safflower, cotton, coffee, orange juice, beef and pork products, cocoa, and agricultural and fishery inputs (fertilizers, natural gas and its derivatives, and diesel).

To grant coverage, the Agricultural Marketing Services Agency (ASERCA), responsible for managing this program, among others, goes on the futures markets of international exchanges in Chicago and New York and takes opposite positions to the ones taken by the claimants, which enables it to offset possible losses on the spot market. The cost of the operations (premium plus commissions) is reported to the interested parties, and, depending on the modality used, can be paid in part by ASERCA and eventually recovered.

It is important to highlight ASERCA's experience with combining price coverage and contract farming systems. The support payments to acquire price coverage are granted preferentially to participants in supported contract farming systems, offering certainty to producers and buyers against the aforesaid price volatility. There has been a significant increase in the number of participating economic agents in recent years.

More recently, around 2005, **Colombia** designed a program to reduce the exchange rate uncertainty of international prices for yellow corn producers, and later white corn, sorghum and soybeans were added to the program. The Program for Protection of Income for Yellow Corn, White Corn, Sorghum, and Soybeans<sup>49</sup> provides coverage to farmers that sell on the national market and compete with imported products. The government subsidizes part of the premium needed to insure the producer against international price and exchange rate changes.

Likewise, the Program for Protection of Income for Producers of Exportable Agricultural Goods covers part of the premium to insure exporting farmers against the effects of fluctuating exchange rates.

Coverage programs are effective mechanisms for protection against short-term variations, but they do not provide protection for prolonged periods of low prices. Moreover, because of their complexity, this type of financial instrument is generally used only by large producers, who have the necessary know-how and resources to take advantage of them.

### *Contract Farming*

Contract farming, which has over a thousand-year old history beginning in Ancient Greece, has gained strength in recent years as an instrument to control price volatility for producers. Various countries have followed these practices.

In the case of Chile, it has been used for industrial tomatoes, sugar beets, tobacco, corn seed beds, and other annual crops. It involves an alliance between private parties in which, on the one hand, the processing company participates to guarantee the volume and quality or specific characteristics of its supply of agricultural raw materials, and, on the other, farmers participate to guarantee a known price for their future production. The farming contract usually includes the supply of all or part of the crop inputs by the agroindustrial firm and the option of delivering financing for all costs (a direct solution, especially useful for small farmers without access to bank credit), payable against the output obtained by the producer at the time of harvest.

The Chilean government promotes contract farming by strengthening networks of local farmers and national associations representing them.<sup>50</sup> On the premise that associations strengthen competitiveness and promote contract farming, the Chilean

49 [http://www.minagricultura.gov.co/07presupuesto/07a\\_din\\_cobertu.aspx](http://www.minagricultura.gov.co/07presupuesto/07a_din_cobertu.aspx). Consulted April 2009.

50 <http://www.odepa.gob.cl/odepaweb/servicios-informacion/publica/Agricultura2014.pdf>. Consulted April 2009.



government offers the Suppliers Development Program (PDP).<sup>51</sup> The purpose of the program is to support the integration of micro, small, and medium-sized suppliers into the production chain of a larger enterprise, so as to improve and stabilize their commercial link with it.

Contract farming is a highly effective instrument to protect farmers against risks and uncertainty due to short-term price volatility, and represents a mechanism to redistribute the surplus within the value chains. There are conditions that ensure the viability of the contracts, such as the need for it to be in the mutual interest of the parties to commit to a contractual link, and the requirement that the commercial relationship be economically viable. In 1995, ECLAC began detailed studies on contract farming in 13 LAC countries that were later systematized together with FAO. FAO has also developed a complete manual on contract farming that defines the modalities and conditions for use of these instruments (FAO, 2001).

### *Guaranteed prices and direct payments*

Countries such as Brazil, Mexico, and the United States, among others, have fixed guarantee or target prices for sensitive products (some grains and oilseeds, primarily), for the purpose of maintaining a certain income level for producers.

**United States** has a long history of using income stabilization mechanisms that dates back to the first Farm Bill of 1933, including fixing target prices and payments for shortfalls. The more recent Farm Law passed in May 2008, which covers the five-year period from 2008 to 2012 and is designed to provide support and income security to domestic producers, covers sugar, dairy products, grains, oilseeds, and vegetables.<sup>52</sup> These sectors together accounted for about 40% of the value of agricultural output in the U.S. in 2008.

The 2008 Farm Law includes the following policy instruments for stabilization of producer income, based on the target prices established in it: a) the Marketing Assistance Loan Program, that grants producers financing so that they can warehouse their output at the time of harvest and use it as collateral; this also operates as a minimum price at which the government is required to receive the crop as total payment for the debt, should the market price be below the loan rate;<sup>54</sup> b) direct payments, that consist in a fixed payment per hectare that is not linked to production levels; the amount is determined by the type of crop, the area planted, and the base yield for the producer; and, c) counter-cyclical payments, paid to producers whenever the market price is lower than the target price, discounting direct payment.

Minimum guaranteed prices can cause distortions in the allocation of productive assets and hamper identification of comparative advantages, especially when equal prices are established throughout the territory. Minimum prices assume control of international trade flows, and for that reason, they run counter to the philosophy of WTO agreements.

Concentration of government payments in a certain number of large agricultural producers is also a risk run in guaranteed price and direct payment policies. This risk can be mitigated by introducing maximum limits on payments received by each farmer or by focusing the instrument on regions or specific types of producers. When this type of policy is followed, it is recommended that a determination of minimum or target prices be avoided on an annual basis, due to the high social and political cost involved in negotiating them, and that they be fixed for multi-annual periods.

There is no doubt that providing a certain medium-term security for the income to be received by producers helps encourage production, long-term

51 <http://www.usda.gov/wps/portal/farmbill2008?navid=FARMBILL2008>. Consulted April 2009.

52 To avoid the accumulation of government stocks, the Farm Law stipulates that farmers can opt to sell their output on the market and receive another of three types of payments used in this case: "Marketing loan", "Loan deficiency payment", or "Certificate exchange gains", which allows them to totally cover their debt.

investment, and even research. If this type of policy is followed, however, it is recommended that the focus center on the beneficiaries and products, so as to minimize its cost to government and market distortions.

### ***Government purchases***

Some countries are involved in the direct purchase of agricultural products, and use them to stabilize domestic prices and supply social food distribution programs. Mention should be made of the programs of the National Supply Company of Brazil, both those that acquire commodities at guarantee prices, and those that are specifically geared to supporting small or family farming. The Food Acquisition Program, for instance, which began in 2003/2004, purchases both agricultural products and livestock at market prices. The products are either warehoused or go to food support programs. Government food purchases can lead to the accumulation of stocks and hamper their later management, thereby incurring high administrative costs and possible market distortions. However, it is possible to grant export incentives, provided they are permitted under WTO, or incentives for their domestic sale, or alternatively to use the products to supply government-sponsored social programs, such as school lunch halls, soup kitchens, food distribution centers, and the like). And, in the case of small farmers, they can be an important mechanism in their transition to more dynamic local markets with low transaction costs.

### ***Income Stabilization Funds and Income Insurance Programs***

Perhaps one of the most “advanced” mechanisms in terms of the shared responsibility of producers is the income stabilization fund.<sup>56</sup> Canada and

Colombia have pioneered in implementing this type of fund.<sup>53</sup>

In the case of **Colombia**, the National Coffee Fund helps stabilize the income of the coffee sector by reducing the effects of the volatility of international market prices. Established as a parafiscal account, financed primarily with resources obtained from a coffee fee charged to coffee exporting producers,<sup>54</sup> the National Coffee Fund guarantees the purchase of coffee harvests throughout the year to coffee growers, at a known domestic price, that is computed transparently and reflects international price fluctuations.<sup>55</sup> The Fund is managed by the Colombian National Coffee Growers Federation and is financed by the government under the Government Support for Coffee Growing Agreement (AGC), which finances various initiatives for support to the sector, including coverage against price and exchange rate risks.

Stabilization funds are generally used for export products. The capacity of funds to protect income and achieve sustainability over time depends on the level of producer participation, the public contributions provided, and the operational procedures of the fund. Some analysts question the use of this type of funds (Bowbrick, 1981), since in view of the cycles of high global prices, more income could be used more efficiently by making productive investments instead of putting it into a fund or a premium.

In 2007, **Canada** replaced its agricultural income stabilization program (CAIS) by the “AgriStability” y “AgriInvest” initiatives, which, together with “AgriRecovery” and “AgriInsurance,” form the pillars of a new risk management package for agricultural enterprises.

AgriStability is a program based on the producer’s profit margin. The program, which is a type of income insurance, provides support payments when

53 *The U.S. Program LGM-Dairy uses a similar approach, as a type of insurance that is related to the firm’s gross income instead of linking it to milk production.*

54 *Coffee growers contribute 5% of the price of Colombian coffee exports. The value of this contribution cannot be more than US\$0.04 per pound, or less than US\$0.02. In addition, to stabilize income, producers contribute US\$0.03 per pound sold at a price over US\$0.95.*

55 *Law 788 of 2008 <http://www.cafedecolombia.com/docs/pdfcomercial/contribucionley788.pdf>. Consulted April 2009.*

there are important losses in producers' income and when the profit margin of the ongoing year decreases in relation to the average historic profit margin. The federal government finances 60% of the program and provincial or territorial governments provide 40%. This instrument is complemented by AgriInvest which, like the previous program, has been in operation for five years, and consists in creating savings accounts in financial institutions for producers, who make annual deposits in them, and in turn receive an equal amount from federal and provincial governments. The funds in these accounts may be used by producers to offset slight decreases in their income or to make investments to reduce agricultural risks or increase their income.

The primary weaknesses of this type of program lie in their cost, administrative complexity, and management of information by the producer. These factors have limited their application in various countries, including the U.S. (Dismukes & Durst, 2006). In the case of AgriInvest, the requirement that producers have complete accounting records to determine their net income is, in any event, an advantage in terms of management training, risk identification, improvement of the risk mitigation strategy, and the possibility of stabilizing the farmer's income. But, it can be a limiting factor in terms of management costs, and because business accounting requires a basic infrastructure and advanced accounting and technical training that are not always available to small farmers, unless there is constant monitoring and follow-up by government extension services.

The availability and accessibility of new information technologies (Internet), the decentralization seen today in virtually all the countries of the region, and the participation of producer associations can play an important role in reducing the administrative costs of this type of programs (in Canada, farmers cover part of the administrative cost of the program), and the risk of corruption.

All of the policy and program instruments indicated represent expenses for government, which some countries may not be able to cover. There is another type of mechanism under the responsibility of

## **Box 20:** International agreements

Protection for agricultural producers in countries open to imports, in a situation of marked price volatility and during prolonged periods of relatively low agricultural prices, is one of the most pressing challenges for developing countries, most of which do not fulfill the requirements to use the Special Agricultural Safeguard accepted by WTO. As an alternative, under WTO negotiations, consideration was given to introducing a new instrument, the Special **Safeguard Mechanism**, to be used exclusively by developing countries that meet certain requirements, to improve food security and rural development. Its use is regulated to ensure that it will be transparent and restricted, and that it will not isolate producers from long-term price trends. The global awareness of the need to have an instrument of this sort is a strong signal that a country's openness to trade should not put it at a disadvantage during times of price crises that could quickly turn into a damaging avalanche of imports (Valdés & Foster, 2005).

A different approach to stabilization of agricultural prices was proposed at a meeting of the Agricultural Committee of the G8 in Cison di Valmarino (Italy) on April 20, 2009. The Committee proposed that an **International System for Basic Grain Stock Management** be created. This new instrument, which was first suggested in the 1970s at the time of the food price crisis during that decade, could contribute directly to reducing food price volatility, as a response to peaks in demand, and could contribute indirectly by limiting the interest of financial speculators in agricultural raw materials. The process of setting up a system of international stocks has been complicated by possible administrative difficulties and problems in managing the system. A solution, however, would represent a priority political response that would help minimize the impact of future crises.

Von Braun and Torero (2009) have developed a specific idea for creating an international stockholding system, and propose the creation of an **Independent Emergency Reserve and a Virtual Reserve**. The first would be used to respond to food crises by supplying emergency distribution programs, while the second would prevent financial speculation through a market mechanism that would be activated when the market price for basic grains approached a maximum prefixed band.

consumers that can also stabilize income, and that is one of the issues being negotiated in WTO today: the Special Safeguard Mechanism. Under this, governments can, as an alternative or in addition to national farmer support programs, respond to agricultural needs with policy actions that require negotiations and multilateral agreements.

### ● Policy instruments for consumers

Poor households that are net food buyers—families that spend from 50% to 80% of their income on food purchases—comprise the group most vulnerable to spiraling prices that occur in a situation of marked volatility on the current market. This segment of the population includes poor living in urban areas (two-thirds of the poor in Latin America and the Caribbean), and a portion of those residing in rural areas, with limited access to land and other resources. Their situation is increasingly fragile, and there is a fear of a dramatic increase in the undernourished population, which would have serious consequences for long-term development prospects. The challenge to national governments and the international community posed by this group is to put into place measures that would prevent further impoverishment and guarantee their food security, without neglecting to ensure medium- and long-term protection policies that their precarious economic situation will still call for.

#### *Conditioned Transfer Programs*

Some countries of the region have implemented Conditioned Transfer Programs which, although designed as programs to help alleviate poverty in the long run, could become important mechanisms in the short run to deal with price volatility, due to the flexibility of these instruments. Thus, various initiatives, such as “Opportunities” in Mexico, “Families in Action” in Colombia, “Family

Allowance” in Brazil, and the “Social Protection Network” in Nicaragua, to name a few, have achieved significant effects in improving the nutrition of the neediest.<sup>56</sup>

In situations of a food crisis due to a drop in the purchasing power of poor families, Conditioned Transfer Programs maintain a focus on aid to the families receiving the transfer, namely, the most vulnerable ones; the amount transferred is modified on the basis of the cost variation of a basic food basket. However, the programs cover only part of the vulnerable population, leaving without coverage persons whose incomes are very close to the poverty line and who are severely affected by a spike in food prices. To mitigate this weakness in transfer programs, there could be a segment of secondary beneficiaries who receive transfers only in times of a price crisis, and then leave the program once the crisis disappears. Designing a program of this sort poses major challenges for implementation and criteria for classifying beneficiaries, but international experience could help resolve these issues for interested countries.

#### *Programs to promote consumption of traditional and non tradable products*

Policies that promote consumption of indigenous, traditional products, and in general products that are not traded on international markets, could also help mitigate the impact of agricultural price volatility. To recover and promote the growing of traditional agricultural products, whose prices are formed on local markets, with a view to making them a pillar of food security and local economic development, is an approach that could bring substantial benefits to persons living in outlying rural areas, and who today are to some extent following a Western diet. This would open up a large space for mayors and governments to design and implement policies that would promote local brands and products as a way of dealing with price volatility, and provide a boost to local or regional economic activity.

<sup>56</sup> <http://www.rlc.fao.org/es/prioridades/seguridad/ingreso3/>. Consulted April 2009.

Countries such as **Ecuador** (Food Sovereignty Law) and **Peru** (PAPAPAN) have institutions that foster the recovery and use of local and traditional products. A renewed emphasis on local foods—the demand for which can be stimulated through festivals and cooking competitions—triggers a chain of positive effects, e.g.: improvement of the family diet, due to the availability of a wider variety of foods and the valuable nutritional content of many of them; strengthening of the economies of small farmers, the main producers of these traditional crops; greater independence on the part of poor families to protect them from the effects of food crises stemming from increased prices for raw materials on the global market; and, a heightened esteem for traditional cultures, which will ultimately help preserve them and ensure social cohesion.<sup>57</sup>

### *Public-private agreements*

**Public-private price agreements**, designed to offer consumers affordable food prices during sharp rises on the international market and to avoid recourse to government price setting, also present valid options at certain times. Countries such as **Uruguay** concluded various agreements with the private sector for items such as rice and beef in 2007 and 2008. Other countries in the region, such as Mexico, Ecuador, Guyana, Honduras, and Guatemala, have done the same for certain sensitive products.

Public-private agreements, when legislation permits, can represent a valid alternative to price controls, but they require a willingness on the part of business to cooperate with the government in order to benefit consumers, and are more acceptable when the national market is not as large or is marginal, compared with the export market. Moreover, these agreements should be temporary in nature, to deal with an acute crisis. They cannot be extended over time, because they create distortions on the national market and could even end up reducing the supply of products.

The disadvantages of these agreements are their limited focus on the vulnerable population, and their negative effects in terms of reducing the trading margins of small and highly specialized companies. To mitigate these adverse effects and prevent market distortions, mechanisms to focus on benefits for a limited public should be developed.

The array of social policies that governments implement to support the poorest sectors have to be coordinated, to achieve synergies among the programs. Threats arising from price volatility, for instance, could be at least partially relieved by using nontraditional strategies, which at the same time help improve the living conditions of the vulnerable, poor population.

### ● **Conclusion**

The volatility of the prices of most food raw materials has increased, as a result of the presence of new factors that are expected to continue to influence the global market in the medium and even the long run. Heightened uncertainty poses the risk of discouraging production and investment in the agricultural sector, thereby weakening the local food supply and exacerbating the food security challenge of the poorest families.

Agricultural production requires long-term investments, but the market has not so far offered income protection mechanisms that go beyond one or two crop cycles. It therefore appears that government participation is needed to ensure income for sensitive groups, including both producers and consumers, according to its own policy objectives.

The heterogeneity of the productive sector is such that a long-term approach is required for its analysis, one that takes into account all of the obstacles and risks it faces, so that policies and

<sup>57</sup> *Activities under a specific project implemented for this purpose can be found at: <http://www.rlc.fao.org/proyecto/163nze/proyecto.htm>. Consulted April 2009.*



## Box 21:

### Nutrition education programs as a response to price volatility

*New approaches to assistance for poor families generate nutritional benefits and strengthen family economies.*

The diet of persons with scarce resources is characterized by consumption of a reduced variety of products with a high component of carbohydrates, obtained from relatively cheap sources. The lack of proteins, vitamins, and micro-elements in their food is reflected in unbalanced nutrition, frequently with serious repercussions on the intellectual and physical development of children. In addition, since grain prices—the main source of energy for families—reflect international market fluctuations, they can suddenly shoot up, as has happened in recent periods, adversely affecting their purchasing power and reducing the total amount of food ingested. However, a varied diet, that includes fruits, vegetables, tubers, meat, etc., improves the nutrition of families and, if the local supply of these products is large, it also allows persons to increase their capacity to respond to crises, by replacing some products with others that are relatively and temporarily less costly.

An initiative to expand the range of foods in the diet of families by increasing children's knowledge of food and nutrition was implemented by FAO, in a project entitled "Education in the Primary Schools of Chile."<sup>58</sup> Through integrated teaching materials and programs in the primary school curriculum, the inclusion of varied products in the diet was promoted, as an indirect contribution to strengthening the capacity of families to mitigate the effects of high prices for some foods. A different approach with a similar objective was developed in Brazil.<sup>59</sup> This effort focused on introducing school gardens, to provide integral education—in foods, nutrition, and the environment—and to encourage the inclusion of local foods in the diet, which in turn led to family gardens and new eating habits in households.<sup>60</sup>

In addition to the advantages inherent in balanced nutrition, food education for poor families stimulates an interest in producing their own food. The spread of family gardens or small animal breeding, which can even be done in urban or peri-urban settings, can lead to local production or self-production of significant volumes of food, and in this way can partially remove consumers from market dynamics, and ultimately reduce the influence of adverse changes in food prices on families. At the same time as local micro-economies are promoted, the food security of the poor is improved.

Methodologies developed by FAO and other institutions have been implemented in urban and peri-urban agricultural projects in countries of the region (Colombia, Peru, Ecuador, Bolivia, and Venezuela). In the case of Colombia, for example, production for self-consumption and/or local sale is estimated at up to US\$1.3 per family per day. This production—fruits, vegetables, beans, tubers, some grains, and other foods—not only is of value in the diet, but it also represents an economic contribution, since it enables persons to: i) reduce their food expenses, with the consequent freeing up of resources for other purposes; and ii) support small local businesses, that are independent of the dynamics on wholesale markets.

58 <http://www.rlc.fao.org/es/nutricion/pdf/edualim.pdf>. Consulted April 2009.

59 <http://www.educandocomahorta.org.br>. Consulted April 2009.

60 Some methodological and teaching materials on nutrition education developed by FAO are available at: <http://www.rlc.fao.org/es/nutricion/edualim.htm>. Consulted April 2009.



programs are adopted in a consistent and open-minded way, with consideration given to the impact on consumers, with a focus on sensitive groups, to avoid overburdening government finance, and with a view to reducing possible distortions in the allocation of productive resources.

The short-term objective and the long-term effects should be adequately weighed by government when it adopts policies, so that the tools applied represent effective progress in reducing the vulnerability of affected population segments, and measures that could ultimately prove to be counter-productive by promoting greater protectionism or increased distortions are avoided.

Using incentives that encourage participation of the private sector (individual producers, organizations, and businesses) in initiatives designed to control the risks of their activity is

one way to work together for the common good and maximize the use of public resources.

Establishment of the Special Safeguard Mechanism in WTO, so that developing countries have a way to protect themselves during times of price crises, is one reason for strengthening the openness of countries to trade, and countries should fight for this in the Doha Round.

Government measures should take into account the complex socio-economic effects of price volatility. To deal with this complexity, government policies should maintain a systemic, long-term approach, and endeavor to generate synergies and ensure adequate coordination, so as to maximize the positive effects of public and private investment. A combination of policy instruments thus helps minimize the vulnerability of producers and consumers and reduce distorting effects.

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# STATISTICAL ANNEX

This annex is a summary of a common data base and a series of indicators which are available to all interested parties at: [www.agriruralc.org](http://www.agriruralc.org).

**Table A.1.** GLOBAL GROWTH PROJECTIONS <sup>1</sup>  
Annual rate of growth of GDP, by groups of countries  
(Developed countries, emerging and developing economies)

Group of countries	International Monetary Fund					
	2005	2006	2007	2008	2009	2010
World <sup>2</sup>	4,5	5,1	5,2	3,2	-1,4	2,5
World <sup>3</sup>	3,4	3,9	3,8	2,1	-2,6	1,7
Developed economies	2,6	3,0	2,7	0,9	-3,8	0,6
Euro Zone	1,7	2,9	2,7	0,9	-4,8	-0,3
Emerging and developing economies	7,1	7,9	8,3	6,1	1,5	4,7
Latin America and the Caribbean	4,6	5,5	5,7	4,2	-2,6	2,3
Group of countries	World Bank					
	2005	2006	2007	2008	2009	2010
World <sup>2</sup>	4,8	5,0	5,0	3,0	-1,7	2,8
World <sup>3</sup>	3,4	4,0	3,8	1,9	-2,9	2,0
Developed countries	2,6	2,9	2,6	0,7	-4,2	1,3
Euro Zone	1,5	2,9	2,7	0,6	-4,5	0,5
Developing countries	6,8	7,7	8,1	5,9	1,2	4,4
Latin America and the Caribbean	4,6	5,6	5,8	4,2	-2,2	2,0
Group of countries	DESA – United Nations					
	2005	2006	2007	2008	2009	2010 <sup>4</sup>
World <sup>1</sup>	4,5	4,9	4,9	3,3	-1,0	2,7
						[1,2; 3,4]
World <sup>2</sup>	3,5	4,0	3,8	2,1	-2,6	1,6
						[0,2; 2,3]
Developed countries	2,4	2,9	2,5	0,8	-3,9	0,6
						[-0,4; 1,1]
Euro zone	1,7	2,8	2,6	0,8	-3,7	-0,1
						[-1,2; 0,5]
Developing countries	6,8	7,1	7,2	5,4	1,4	4,3
						[2,0; 5,5]
Latin America and the Caribbean	4,6	5,5	5,5	4,0	-1,9	1,7
						[-0,7; 3,2]
<b>Sources:</b>						
IMF, Data Base of the World Economic Outlook of April 2009 and July 2009 update						
World Bank, Global Economic Prospects 2009 and updated internet site as (July 20, 2009).						
United Nations Department of Economic and Social Affairs, World Economic Situation and Prospects, update as of mid-2009.						
1. Based on information available as of July 20, 2009						
2. Aggregation by purchasing power parity						
3. Aggregation by exchange rates						
4. The first value corresponds to the base scenario; the values in parentheses correspond to the range between the pessimistic and optimistic scenarios.						

**Table A.2. GROWTH PROJECTIONS IN THE AMERICAS**  
Annual GDP growth rate, by country  
(Canada, United States, and Latin America and the Caribbean)

	Growth rates				Projections			
	ECLAC (07/09)		IMF (05/09)		ECLAC (07/09)		IMF (05/09)	
Country	2007	2008	2007	2008	2009	2010	2009	2010
Canada (IMF)			2,5	0,4			-2,3	1,6
United States (IMF)			2,0	1,1			-2,6	0,8
Antigua and Barbuda			6,9	4,2			-2,0	0,0
Argentina	8,7	7,0	8,7	7,0	1,5	3,0	-1,5	0,7
Bahamas, The			2,8	-1,3			-4,5	-0,5
Barbados			3,4	0,6			-3,5	0,5
Belize			1,2	3,0			1,0	2,0
Bolivia (Plurinational State of)	4,6	6,1	4,6	5,9	2,5	3,5	2,2	2,9
Brazil	5,4	5,1	5,7	5,1	-0,8	3,5	-1,3	2,2
Chile	5,1	3,2	4,7	3,2	-1,0	3,5	0,1	3,0
Colombia	7,5	2,6	7,5	2,5	0,6	3,5	0,0	1,3
Costa Rica	6,8	2,9	7,8	2,9	-3,0	3,0	0,5	1,5
Cuba	7,0	4,3			1,0	3,0		
Dominica			1,5	2,6			1,1	2,0
Dominican Republic	8,5	5,3	8,5	4,8	1,0	2,0	0,5	2,0
Ecuador	2,7	6,5	2,5	5,3	1,0	2,5	-2,0	1,0
El Salvador	4,7	2,5	4,7	2,5	-2,0	2,5	0,0	0,5
Grenada			4,5	0,3			-0,7	1,0
Guatemala	5,7	4,0	6,3	4,0	-1,0	2,5	1,0	1,8
Guyana			5,4	3,2			2,6	3,4
Haiti	3,2	1,3	3,4	1,3	2,0	2,0	1,0	2,0
Honduras	6,3	4,0	6,3	4,0	-2,5	2,5	1,5	1,9
Jamaica			1,4	-1,2			-2,6	-0,3
Mexico	3,3	1,3	3,3	1,3	-7,0	2,5	-3,7	1,0
Nicaragua	3,0	3,2	3,2	3,0	-1,0	2,5	0,5	1,0
Panama	11,2	9,2	11,5	9,2	2,5	5,0	3,0	4,0
Paraguay	5,5	5,8	6,8	5,8	-3,0	3,0	0,5	1,5
Peru	9,0	9,8	8,9	9,8	2,0	5,0	3,5	4,5
St. Kitts and Nevis			2,9	3,0			-1,2	0,0
St. Lucia			1,7	1,7			-1,4	0,0
St. Vincent and the Grenadines			7,0	0,9			0,1	1,2
Suriname			5,5	6,5			2,8	2,5
Trinidad and Tobago			5,5	3,4			0,5	2,0
Uruguay	7,4	8,9	7,6	8,9	1,0	3,5	1,3	2,0
Venezuela (Bolivarian Republic of)	8,4	4,8	8,4	4,8	0,3	3,5	-2,2	-0,5
<i>Latin America</i>	<i>5,8</i>	<i>4,2</i>			<i>-1,9</i>	<i>3,2</i>		
<i>Caribbean</i>	<i>3,4</i>	<i>1,5</i>			<i>-1,2</i>	<i>0,5</i>		
<i>Latin America and the Caribbean</i>	<i>5,8</i>	<i>4,2</i>	<i>5,7</i>	<i>4,2</i>	<i>-1,9</i>	<i>3,1</i>	<i>-2,6</i>	<i>2,3</i>

Source: IMF, World Economic Outlook Database, April 2009; ECLAC, Economic Study, July 2009.

**Table A.3. INFLATION, PURCHASING POWER OF EXPORTS, AND REMITTANCES**

Countries	Consumer price index <sup>1</sup>		Index of purchasing power of exports <sup>1</sup> (2000 = 100)		Remittances from abroad <sup>2</sup>							
	General level		Food		Millions of dollars							
	Average inter-annual rate of change		Average inter-annual rate of change		Average inter-annual rate of change							
	2000-04	2005-08	2008	2000-04	2005-08	2008	2006	2007	2008			
Argentina	8,3	9,5	8,6	10,8	10,3	6,8	6,3	14,3	16,5	850,0	920,0	955,0
Bahamas	2,0	2,5	4,0	1,8	4,2	5,4						
Barbados	1,6	6,2	7,1	3,3	8,6	10,6						
Belize										93,0	105,0	110,0
Bolivia (Plurinational State of)	2,9	8,1	14,0	2,2	12,4	24,6	17,8	12,7	19,7	1,030,0	1,050,0	1,097,0
Brazil	8,7	5,1	5,7	9,2	5,7	13,1	12,5	8,8	5,9	7,373,0	7,075,0	7,200,0
Chile	2,8	4,9	8,7	1,1	7,7	16,1	11,5	10,9	-6,4		850,0	880,0
Colombia	7,3	5,5	7,0	8,0	7,8	11,4	4,9	13,0	14,2	4,200,0	4,520,0	4,842,0
Costa Rica	10,6	12,0	13,4	10,7	15,9	21,4	-0,7	8,7	1,8	520,0	560,0	624,0
Ecuador	31,4	4,0	8,4	32,9	7,2	16,9	8,1	13,0	18,5	2,900,0	3,085,0	2,822,0
El Salvador	2,9	5,1	7,3	2,6	6,8	11,8	6,0	5,2	6,1	3,316,0	3,695,0	3,788,0
Guatemala	6,9	8,5	11,4	8,2	11,3	15,1	4,3	5,7	4,6	3,610,0	4,128,0	4,315,0
Guyana										270,0	424,0	415,0
Haiti	20,0	13,1	15,5	21,5	15,3	21,8	-3,5	-1,3	-18,7	1,650,0	1,830,0	1,870,0
Honduras	8,8	8,2	11,4	6,3	10,3	17,0	7,8	-3,2	-5,4	2,359,0	2,561,0	2,701,0
Jamaica	9,3	-1,2	-35,9	7,9	15,8	30,6				1,770,0	1,975,0	2,033,0
Mexico	6,0	4,2	5,1	5,5	5,8	8,0	4,7	5,7	3,6	23,742,0	23,979,0	25,145,0
Nicaragua	7,3	12,4	19,6	6,1	16,4	29,0	8,8	9,7	7,6	950,0	990,0	1,000,0
Panama	1,2	4,6	8,8	0,5	6,8	14,9	1,9	9,5	6,7	292,0	320,0	325,0
Paraguay	9,1	8,7	10,1	10,3	13,3	15,5	2,2	23,7	30,6	650,0	700,0	700,0
Peru	2,4	2,8	5,8	1,5	3,8	9,2	10,5	11,6	0,9	2,869,0	2,900,0	2,960,0
Dominican Republic	20,1	7,1	10,6	21,3	5,8	14,3	0,3	0,8	-5,3	2,900,0	3,120,0	3,111,0
Saint Lucia	1,9	4,0	6,7									
Suriname	70,9	10,4	15,2							102,0	115,0	120,0
Trinidad and Tobago	4,2	8,6	11,4	11,8	22,0	24,4				110,0	125,0	130,0
Uruguay	10,3	6,8	7,9	11,1	9,8	13,7	3,6	8,9	9,2	115,0	125,0	130,0
Venezuela (Bolivarian Republic of)			31,4	25,1			10,1	14,7	29,6	300,0	330,0	832,0
Latin America							7,0	9,1	7,2			

ECLAC information revised as of March 9, 2009

**Sources:**

1 / ECLAC: based on official information (Economic Indicators and Statistics - BADECON).

2 / IDB.

Table A.4. Annex 4. GROSS DOMESTIC PRODUCT AND AGRICULTURAL VALUE ADDED

Countries	Gross domestic product per capita				Agriculture value added as a percentage of GDP				Rate of change in GDP				Rate of change in agriculture value added			
	Constant dollars of 2000				Percentage				Average inter-annual rate				Average inter-annual rate			
	2000/05	2005/08	2008	2008	1995/99	2000/05	2008	2008	2000/05	2005/08	2008	2008	2000/05	2005/08	2008	2008
Antigua and Barbuda	9103,8	11 271,7	12 135,6	12 135,6	3,4	3,2	2,6	2,6	4,4	8,3	2,5	2,5	1,8	3,0	3,0	2,8
Argentina	7354,3	9060,7	9952,5	9952,5	4,6	5,0	4,3	4,3	2,0	8,0	7,0	7,0	2,9	3,5	3,5	-1,5
Bahamas	17 736,4	18 142,4	18 469,7	18 469,7	2,2	2,0	1,3	1,3	0,5	3,0	1,5	1,5	-2,6	-5,2	-5,2	1,0
Barbados	5954,7	6582,1	6781,3	6781,3	5,5	4,6	3,6	3,6	1,4	2,7	1,5	1,5	-3,5	-1,4	-1,4	-0,7
Belize	3688,6	3989,5	4044,0	4044,0	14,7	15,7	12,3	12,3	5,4	3,2	3,8	3,8	9,4	-8,6	-8,6	2,9
Bolivia (Plurinational State of)	1004,9	1082,3	1134,2	1134,2	13,3	13,2	12,8	12,8	3,1	5,2	6,1	6,1	3,5	3,9	3,9	8,2
Brazil	3773,4	4146,3	4374,9	4374,9	4,6	5,2	5,3	5,3	2,8	4,9	5,1	5,1	4,2	5,4	5,4	5,8
Chile	5227,9	5994,9	6247,8	6247,8	5,0	5,4	5,4	5,4	4,2	4,1	3,2	3,2	7,0	2,6	2,6	2,1
Colombia	2361,2	2736,5	2879,4	2879,4	9,4	9,5	8,5	8,5	3,9	5,7	2,6	2,6	2,6	3,5	3,5	2,7
Costa Rica	4208,2	4904,8	5168,7	5168,7	9,1	8,2	7,5	7,5	4,1	6,5	2,9	2,9	2,0	5,0	5,0	-2,3
Cuba	3000,0	3972,9	4354,3	4354,3	6,7	6,0	4,3	4,3	5,0	7,8	4,3	4,3	-2,3	5,2	5,2	5,0
Dominica	3902,9	4441,7	4722,4	4722,4	16,7	14,7	11,8	11,8	0,7	4,0	3,4	3,4	-1,6	-1,0	-1,0	0,0
Ecuador	1420,2	1627,6	1704,7	1704,7	9,7	10,5	10,5	10,5	5,4	4,3	6,5	6,5	4,9	4,9	4,9	5,4
El Salvador	2105,7	2213,3	2272,6	2272,6	10,4	9,3	10,4	10,4	2,3	3,8	2,5	2,5	1,2	7,8	7,8	7,3
Grenada	4259,1	4570,1	4690,7	4690,7	7,6	6,0	5,0	5,0	2,2	1,2	2,1	2,1	-8,3	14,0	14,0	14,3
Guatemala	1549,8	1636,7	1690,4	1690,4	14,6	14,1	13,1	13,1	3,0	5,0	4,0	4,0	3,0	2,4	2,4	2,0
Guyana	824,5	883,4	940,7	940,7	32,3	35,4	30,2	30,2	0,5	4,5	3,1	3,1	2,3	0,3	0,3	-5,8
Haiti	403,1	388,7	391,5	391,5	25,8	22,4	20,3	20,3	-0,5	2,3	1,3	1,3	-1,0	-0,5	-0,5	-5,7
Honduras	1213,8	1390,2	1452,8	1452,8	14,9	14,1	13,1	13,1	4,7	5,6	4,0	4,0	2,7	5,5	5,5	3,4
Jamaica	2902,5	3001,8	3012,6	3012,6	8,1	6,4	5,3	5,3	1,5	1,2	0,0	0,0	-2,6	0,0	0,0	-6,0
Mexico	6438,0	6970,1	7116,3	7116,3	4,5	4,2	4,0	4,0	1,9	3,2	1,3	1,3	2,2	3,0	3,0	3,2
Nicaragua	797,3	873,2	899,6	899,6	18,0	18,3	18,2	18,2	3,2	3,6	3,0	3,0	2,9	3,4	3,4	5,5
Panama	4071,4	5004,9	5593,0	5593,0	6,6	7,2	5,9	5,9	4,3	9,7	9,2	9,2	4,6	3,9	3,9	6,0
Paraguay	1333,1	1439,6	1524,2	1524,2	17,0	19,1	21,2	21,2	2,6	5,7	5,8	5,8	5,4	8,7	8,7	8,5
Peru	2192,8	2679,1	2990,1	2990,1	6,9	7,6	6,7	6,7	4,2	8,8	9,8	9,8	2,7	6,1	6,1	6,7
Dominican Republic	2792,1	3321,5	3594,1	3594,1	7,4	6,7	5,4	5,4	3,5	8,1	5,3	5,3	3,4	2,0	2,0	-3,4
Saint Kitts and Nevis	7343,4	8426,5	9125,3	9125,3	3,1	2,6	1,7	1,7	3,3	6,3	9,7	9,7	3,7	-5,5	-5,5	-2,7
Saint Vincent and the Grenadines	3077,3	3710,7	3927,8	3927,8	10,0	8,1	6,1	6,1	3,5	6,0	1,0	1,0	-2,4	2,6	2,6	-7,3
Saint Lucia	4624,1	5108,1	5181,0	5181,0	7,9	4,3	2,8	2,8	2,6	2,5	2,3	2,3	-13,4	5,8	5,8	7,2
Suriname	1979,7	2398,1	2558,5	2558,5	11,7	11,3	9,3	9,3	5,4	5,4	5,0	5,0	2,5	2,5	2,5	3,5
Trinidad y Tobago	7626,0	10 471,5	11 257,6	11 257,6	1,7	1,1	0,6	0,6	8,6	6,9	3,5	3,5	-3,9	1,3	1,3	11,0
Uruguay	6045,7	7260,2	8062,9	8062,9	6,6	6,8	6,1	6,1	0,9	7,0	8,9	8,9	4,5	1,1	1,1	5,7
Venezuela (Bolivarian Republic of)	4613,7	5548,9	5969,4	5969,4	3,6	4,1	3,5	3,5	2,6	7,8	4,8	4,8	2,7	3,2	3,2	5,6
Latin America and the Caribbean	4068,8	4587,4	4834,9	4834,9	5,3	5,5	5,2	5,2	2,6	5,2	4,2	4,2	3,1	4,1	4,1	3,6
Latin America	4098,8	4614,6	4862,3	4862,3	5,3	5,5	5,2	5,2	2,6	5,3	4,2	4,2	3,2	4,1	4,1	3,6
Caribbean	764,3	883,5	918,1	918,1	5,8	4,7	3,4	3,4	3,9	4,3	2,3	2,3	-0,6	-0,9	-0,9	-1,5

from information revised as of May 8, 2009

Source: ECLAC – Based on official information (Economic Indicators and Statistics - BADECON)

Notes: a/ preliminary figures.



**Table A.5. AGRICULTURAL AND RURAL EMPLOYMENT**

Countries	Percentage employed in agriculture <sup>1</sup>		Insertion in labor market of economically active population in rural areas <sup>2,3</sup> (percentages)											
	Percentage <sup>4</sup> of population employed		Employers		Farm wage-earners		Nonfarm wage-earners		Self-employed farmers		Nonfarm self-employed			
	2000	2007	1999/00	2006/07	1999/00	2006/07	1999/00	2006/07	1999/00	2006/07	1999/00	2006/07	1999/00	2006/07
Bolivia (99-07)	36,8	33,2	1,2	3,1	2,7	3,3	6,5	10,2	82,1	73,0	7,5	10,4		
Brazil (99-07)	22,8	17,6	2,0	1,9	15,6	16,3	18,6	20,1	56,4	53,1	7,3	8,6		
Chile (00, 06)	13	12,5	2,4	2,4	40,2	39,0	23,0	30,2	22,8	18,6	8,1	9,7		
Colombia (99-05)	22	18,8	3,7	5,0	25,9	24,5	21,3	14,5	27,9	35,7	21,2	20,3		
Costa Rica (99-07)	16,9	13	8,2	7,3	21,3	18,7	47,9	51,5	9,5	7,7	13,1	14,8		
Ecuador (07)	28,5	28,5		3,7		23,9		17,4		44,3		10,7		
El Salvador (99-04)	20,7	17,8	4,1	3,2	20,2	21,2	30,5	35,2	26,3	20,9	18,8	19,5		
Guatemala (98-06)	36,5	30,6	2,0	1,9	26,6	16,0	16,3	21,5	34,8	40,0	20,2	20,6		
Honduras (99-07)	34	33,2	3,1	1,3	16,4	18,6	17,1	18,6	41,3	39,9	22,1	21,6		
Mexico (02-06)	17,5	13,4	3,3	4,2	15,7	14,6	36,7	40,6	25,4	19,5	18,9	21,1		
Nicaragua (98-05)	32,4	33,6	3,3	3,3	23,7	19,1	20,0	16,5	39,7	48,4	13,3	12,7		
Panama (02-07)	17	18,9	2,0	2,2	14,2	13,8	25,8	30,6	39,3	36,5	18,7	16,9		
Paraguay (99-07)	30,8	28,3	3,4	3,7	7,2	6,3	19,8	21,7	54,0	54,5	15,6	13,9		
Peru c/ (03)	32	37,5	5,0		8,2		6,3		69,5		11,0			
Dominican Republic (02-07)	15,9	14,8	1,7	3,4	5,5	4,3	31,1	38,5	35,0	25,6	26,7	28,2		
Uruguay (07)		11		10,0		32,5		21,4		29,2		6,9		
Venezuela	10,6	8,7												

**Sources:**

1/ ECLAC, 2008 Statistical Yearbook

2/ ECLAC, 2008 Social Panorama (based on special tabulations of home surveys of the different countries.)

3/ With a reference age of 15 years for the PEA

4/ Year closest to the column heading.

Table A.6. POVERTY, EXTREME POVERTY, AND AVERAGE INCOME

Countries	Incidence of poverty <sup>1</sup> and extreme poverty (18 countries) (percentages)						Average monthly household income (17 countries) (multiples of the poverty line)					
	Total poverty in country <sup>2</sup>		Poverty in rural areas		Total extreme poverty in country <sup>2</sup>		Extreme poverty in rural areas		Urban area		Rural area	
	2003/05	2006/07	2003/05	2006/07	2003/05	2006/07	2003/05	2006/07	2003/05	2006/07	2003/05	2006/07
Argentina (04-06)	29,4	21,0			11,1	7,2			8,8	10,8		
Bolivia (04-07)	63,9	54,0	80,6	75,8	34,7	31,2	58,8	59,0	6,8	7,5	2,9	3,5
Brazil (05-07)	36,3	30,0	53,2	45,7	10,6	8,5	22,1	18,1	10,8	11,4	6,3	7,5
Chile (03-06)	18,7	13,9	20,0	12,3	4,7	3,2	6,2	3,5	13,9	14,6	11,1	13,1
Colombia (05)	46,8		50,5		20,2		25,6		8,3		6,2	
Costa Rica (05-07)	21,1	18,6	22,7	19,6	7,0	5,3	9,0	6,8	10,7	11,5	9,8	10,2
Ecuador (05-07)	48,3	42,6	54,5	50,0	21,2	16,0	29,2	23,0	7,4	8,3	5,8	6,6
El Salvador (04)	47,5		56,8		19,0		26,6		6,7		5,2	
Guatemala (06)		54,8		66,5		29,1		42,2		8,8		6,3
Honduras (03-07)	74,8	68,9	84,8	78,8	59,3	45,6	69,4	61,7	5,6	5,8	3,1	3,8
Mexico (04-06)	37,0	31,7	44,1	40,1	11,7	8,7	19,3	16,1	8,9	9,4	7,1	7,6
Nicaragua (05)	61,9		71,5		31,9		46,1		7,3		5,3	
Panama (05-07)	31,0	29,0	47,2	46,6	14,1	12,0	27,5	24,1	11,4	11,3	6,8	7,6
Paraguay (05-07)	60,5	60,5	68,1	68,0	32,1	31,6	44,2	42,5	5,5	5,7	4,8	5,7
Peru 3 (05-07)	48,7	39,3	70,9	64,6	17,4	13,7	37,9	32,9	7,7		3,4	
Dominican Republic (05-07)	47,5	44,5	51,4	47,3	24,6	21,0	28,8	24,6	7,9	8,1	6,2	6,4
Uruguay (05-07)	18,8	18,1		12,6	4,1	3,1		2,4		8,4		8,2
Venezuela (05-07)	37,1	28,5	15,9	8,5								
Latin America 4 (05-07)	39,8	34,1	58,8	52,1	15,4	12,6	32,5	28,1				

Source: ECLAC, 2008 Social Panorama (based on special tabulations of household surveys in the different countries.)

1/ Includes persons under the indigence line or in a situation of indigence (extreme poverty).

2/ The data for Argentina and Uruguay correspond to the urban total.

3/ The average income data are for 2005.

4/ Estimate for 18 countries in the region plus Haiti.

**Table A.7. EXPENDITURE TRENDS FOR PUBLIC AGRICULTURAL RESEARCH, 1981-2006**

Countries	Total expenditure			Rate of change in total expenditure			
	(Millions of dollars PPP - 2005)	2001	2006	1981-91	1991-2001	2001-2006	1981-2006
Argentina	202,70	221,90	448,60	2,57	1,33	16,01	2,97
Belize	1,00	2,30	2,60	2,50	1,33	2,38	1,92
Brazil	1005,40	1194,90	1224,10	2,99	-1,63	-0,66	0,58
Chile	58,20	124,30	98,10	5,54	6,71	-4,63	3,41
Colombia	104,00	176,30	152,40	3,73	3,92	-3,75	0,41
Costa Rica	13,40	26,70	29,90	-0,49	1,07	2,82	3,04
El Salvador	13,50	6,00	5,70	-2,27	-5,48	-3,32	-4,23
Guatemala	21,40	9,00	8,30	-1,43	-4,70	-2,04	-3,82
Honduras	5,50	13,00	11,00	14,60	0,68	-2,94	1,62
Mexico	517,60	437,00	517,60	-3,20	0,85	2,98	0,84
Nicaragua	11,60	22,50	24,10	1,28	4,03	-2,27	2,62
Panama	10,10	10,50	10,00	1,35	-0,68	-0,98	-0,92
Paraguay	2,80	2,60	3,10	-6,53	-3,41	1,54	-0,34
Dominican Republic	14,80	14,60	17,40	-1,99	1,83	4,17	-0,23
Uruguay	17,60	41,80	59,80	8,30	0,80	9,71	4,94
Total sampling (15)	1999,70	2303,50	2614,50	1,79	-0,12	2,56	0,99
Total (26)	2274,70	2702,90	2983,70	1,86	0,02	2,14	1,05

Source: ASTI, March 2009. *Asst Summary Report.*

**Table A.8.** AVERAGE SHARE OF FOOD IMPORTS IN THE DOMESTIC CALORIE SUPPLY (percentages)

Countries	2000/05	2005/07
Argentina	0,66	0,51
Barbados	77,50	82,26
Bolivia (Plurinational State of)	13,01	
Brazil	8,93	7,76
Canada	10,59	12,12
Chile	23,97	29,76
Colombia	28,76	33,59
Costa Rica	49,81	54,96
Ecuador	19,30	25,96
El Salvador	51,38	49,35
United States	3,16	3,59
Guatemala	45,68	47,24
Guyana	9,70	12,49
Honduras	16,27	31,56
Jamaica	68,17	69,65
Mexico	30,55	28,83
Nicaragua	23,02	25,54
Panama		53,00
Paraguay	1,15	2,67
Peru	31,45	33,76
Saint Vincent and the Grenadines	73,26	73,26
Trinidad and Tobago	70,04	75,35
Uruguay	5,69	
Venezuela (Bolivarian Republic of)	34,80	30,14

Foods are made up of groups: vegetable oils, meats, grains, fruits, vegetables, milk, and tubers.  
**Sources:** IICA, based on official FAO information (FAOSTAT).

**Table A.9.** PERCENTAGE OF CALORIE CONSUMPTION FROM ANIMAL SOURCES OUT OF TOTAL CALORIE CONSUMPTION

Countries	Percentage of calories from plants out of total calories (%)	Percentage of calories from animal sources out of total calories (%)	Percentage of calories from fish products out of total calories (%)
Antigua and Barbuda	68,4	29,0	2,1
Argentina	72,1	26,9	0,4
Bahamas	66,4	30,2	1,7
Barbados	75,6	19,7	2,5
Belize	76,6	20,4	1,0
Bolivia (Plurinational State of)	82,0	17,1	0,2
Brazil	78,5	20,9	0,3
Canada	73,3	25,1	1,0
Chile	77,5	21,4	0,8
Colombia	84,2	15,1	0,4
Costa Rica	80,0	19,0	0,4
Dominica	73,9	22,1	2,1
Ecuador	80,6	18,4	0,4
El Salvador	86,5	12,7	0,3
United States	72,0	27,0	0,8
Grenada	73,1	22,3	2,8
Guatemala	90,6	8,8	0,1
Guyana	83,0	13,2	2,9
Haiti	92,2	7,2	0,2
Honduras	86,0	13,5	0,1
Jamaica	83,5	13,4	1,2
Mexico	80,4	18,1	0,7
Nicaragua	88,5	10,6	0,3
Panama	75,6	22,3	0,9
Paraguay	81,6	17,3	0,3
Peru	87,0	10,8	1,6
Dominican Republic	84,3	14,3	0,8
Saint Kitts and Nevis	70,0	24,3	1,7
Saint Vincent and the Grenadines	80,2	17,2	1,0
Saint Lucia	71,1	22,5	2,1
Suriname	86,4	10,8	1,4
Trinidad and Tobago	80,4	15,8	0,9
Uruguay	73,0	26,0	0,5
Venezuela (Bolivarian Republic of)	84,3	13,7	1,4

**Source:** IICA, based on official FAO information (FAOSTAT).

Notes: data for 2003.

Calories from crops come from alcoholic beverages, grains, fruits, tubers, starch from roots, stimulants, spices, sugar and sweeteners, sugar crops, nuts, vegetable oils, and vegetables.

Calories from animal products come from animal fat, eggs, meat, and milk (excluding butter).

Calories from fish products are derived from fish and seafood and other aquatic products.

**Table A.10.** PERCENTAGE OF PROTEIN CONSUMPTION FROM MARINE PRODUCTS  
OUT OF TOTAL PROTEIN CONSUMPTION

Countries	Proteins from fish products (protein/capita/daily), g.	Total proteins consumed (proteins/capita/daily), g.	Percentage of proteins from fish products out of total protein consumption (%)
Antigua and Barbuda	8,71	71,91	12,11
Argentina	1,80	92,33	1,95
Bahamas	7,36	89,43	8,23
Barbados	11,49	91,95	12,50
Belize	5,51	77,93	7,07
Bolivia (Plurinational State of)	0,60	55,46	1,08
Brazil	1,66	85,33	1,95
Canada	5,86	104,75	5,59
Chile	3,47	80,53	4,31
Colombia	1,34	59,89	2,24
Costa Rica	1,60	69,73	2,29
Dominica	9,36	83,20	11,25
Ecuador	1,53	57,26	2,67
El Salvador	1,16	67,44	1,72
United States	4,70	114,67	4,10
Grenada	13,15	85,75	15,34
Guatemala	0,44	56,81	0,77
Guyana	13,15	79,07	16,63
Haiti	0,75	48,59	1,54
Honduras	0,29	56,14	0,52
Jamaica	5,05	68,43	7,38
Mexico	3,33	90,48	3,68
Nicaragua	1,05	61,45	1,71
Panama	2,97	64,32	4,62
Paraguay	1,35	68,57	1,97
Peru	6,13	66,54	9,21
Dominican Republic	2,91	51,05	5,70
Saint Kitts and Nevis	7,63	81,87	9,32
Saint Vincent and the Grenadines	4,38	73,95	5,92
Saint Lucia	9,01	99,31	9,07
Suriname	5,84	59,22	9,86
Trinidad and Tobago	3,62	66,69	5,43
Uruguay	2,10	84,52	2,48
Venezuela (Bolivarian Republic of)	4,80	58,25	8,24

**Source:** IICA, based on official FAO information (FAOSTAT).  
Note : data from 2003.  
Calories from fish products are derived from fish and seafood and other aquatic products.



**Table A.11. ANNUAL CUMULATIVE GROWTH IN TRADE BY SECTORS**

Countries	Crops				Livestock				Fish				Forestry			
	Exports (%)		Imports (%)		Exports (%)		Imports (%)		Exports (%)		Imports (%)		Exports (%)		Imports (%)	
	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07
Antigua and Barbuda																
Argentina	10,6	25,2	-4,3	43,2	6,6	16,1	-12,5	16,1	-1,2	16,7	28,1	28,1	2,0	0,1	1,6	0,2
Bahamas		18,6		10,0	81,1	12,4				3,9	4,9	4,9	5,3	0,0	1,8	0,0
Barbados	4,6	9,9	5,8	1,6	5,3	8,3	6,3	8,3	-0,9	-17,5	8,8	3,8	3,8	0,2	1,6	0,3
Belize	11,5	4,3	1,1	15,8	-16,5	7,9	1,4	7,9	24,0	-30,4	-3,6	-22,3	1,5	0,1	1,5	0,2
Bolivia (Plurinational State of)	10,0	12,9	-1,6	26,4	3,1	30,2	-3,4	-12,4		281,0	-19,6	26,6	1,9	0,3	1,7	0,2
Brazil	17,6	21,8	-3,4	32,3	32,8	22,9	-12,5	23,0	11,1	-5,0	-1,1	30,4	2,1	0,2	1,7	0,2
Canada	7,2	23,7	9,1	15,3	4,7	7,2	2,0	15,8	5,7	0,9	3,8	7,4	1,7	0,0	1,8	0,0
Chile	8,7	16,0	6,9	35,2	36,8	8,1	14,8	3,9	10,2	11,5	16,0	43,7	1,9	0,3	2,0	0,3
Colombia	6,9	9,8	6,1	27,8	28,5	50,0	-13,1	28,1	-1,7	10,3	10,5	22,4	2,1	0,2	1,9	0,2
Costa Rica	5,7	13,9	7,3	32,8	10,2	9,1	2,3	24,3	-0,8	1,0	9,5	26,3	2,0	0,0	1,8	0,0
Dominica	-7,2	-4,7	0,2	15,4	21,2	48,2	2,0	17,6	50,7	-58,6	2,2	4,9	1,8	0,4	1,1	0,2
Ecuador	10,6	13,2	16,4	19,7	-18,9	23,1	15,6	7,8	9,5	18,1	20,1	116,3	2,0	0,3	1,8	0,0
El Salvador	2,6	23,0	8,3	22,7	-1,5	17,5	5,8	18,3	26,8	20,1	39,0	-6,4	1,9	0,2	1,8	0,2
United States	4,4	19,5	8,3	10,9	-2,1	18,2	5,1	3,6	6,1	2,3	4,5	6,3	1,7	0,1	1,8	0,0
Grenada	-9,8	1,8	3,7	10,7	-18,0	57,1	4,2	11,5	-2,3	-4,1	4,2	16,3			1,7	0,0
Guatemala	2,8	18,6	13,3	13,4	1,4	16,2	10,4	5,6	-3,8	34,9	29,9	6,8	2,3	0,1	1,9	0,1
Guyana	6,3	10,7	5,4	18,6	9,7	-5,8	6,2	-12,0	2,9	0,7	-10,9	36,6	1,7	0,2	2,1	0,0
Haiti							0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,7	0,4
Honduras	-1,6	20,5	-1,1	20,8	20,9	-0,7	6,6	21,7	32,0	77,2	21,5	14,0	1,2	0,5	2,1	0,0
Jamaica	0,0	17,6	7,2	12,4	-3,4	1,0	3,2	3,5	-3,5	-2,1	5,9	10,9	4,3	0,0	1,5	0,2
Mexico	7,8	13,0	8,6	17,1	6,8	5,3	6,3	12,6	-2,0	12,3	21,2	22,4	2,1	0,1	1,9	0,1
Nicaragua	5,8	16,2	4,4	31,6	14,4	26,4	-5,8	22,3	3,4	-4,9	-12,1	21,3	1,6	-0,4	2,0	0,0
Panama	3,4	13,0		18,2	-0,4	-10,7		20,7	11,0	1,0		13,5	2,8	-0,1	1,9	0,2
Paraguay	16,6	30,9	-3,6	12,8	23,2	20,5	-1,9	12,7	27,3	-11,2	-2,3	24,3	1,6	0,1	2,0	0,1
Peru	15,2	23,0	10,7	23,6	34,1	22,0	3,5	19,0	7,0	9,6	18,7	-12,2	1,8	0,0	2,0	0,2
Dominican Republic																
Saint Kitts and Nevis	-24,5	60,4	-0,2	15,1	-10,4	48,9	5,2	1,8	-4,5	85,4	1,1	21,7	1,7	0,0	1,7	0,0
Saint Vincent and the Grenadines	-6,1	2,5	2,3	19,7	3,1	-33,6	7,3	11,3	-14,6	6,6	9,4	10,0	3,3	0,5	1,3	0,2
Saint Lucia	-0,8		5,2	10,9	120,8		5,7	7,9	-60,5		8,4	4,4			1,7	0,2
Suriname													1,8	0,1	2,3	0,5
Trinidad and Tobago	3,5	8,5	12,6	14,9	-17,6	40,9	5,5	19,4	-6,6	23,3	22,2	9,1	1,5	-0,1	2,0	-0,1
Uruguay	10,9	21,0	-2,8	21,0	17,0	11,7	16,1	13,8	5,8	12,2	8,2	48,1	2,1	0,2	1,6	0,2
Venezuela (Bolivarian Rep. of)	-9,2		1,9	13,5	-29,9		14,4	33,4	-14,8		-3,6	47,9	1,4	0,0	1,7	0,0

**Source:** IICA, based on official information from the United Nations (COMTRADE).

Note: BRB, BRA, CAN, COL, CRI, SLV, GRD, PAN and VCT – the last period is 2005-08, except for the forestry sector, which runs to 2007.

**Table A.12.** SHARE OF SECTORAL EXPORTS OUT OF TOTAL EXPORTS  
OF MERCHANDISE  
(CUMULATIVE ANNUAL GROWTH, PERCENTAGES)

Countries	Crops		Livestock		Fish		Forestry	
	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07	2000/05	2005/07
Antigua and Barbuda								
Argentina	1,39	6,18	10,31	-9,61	-9,42	-1,01	1,79	-0,10
Bahamas		-24,61		15,18		-33,93		-0,34
Barbados	2,53	6,15	-0,36	1,69	-2,89	-20,29		0,27
Belize	8,89	-8,02	35,97	-26,31	21,10	-38,57	1,41	-0,02
Bolivia (Plurinational State of)	-4,57	-13,91	-10,54	-0,76		190,47	1,52	-0,01
Brazil	0,58	2,83	13,67	3,77	-4,94	-19,77	1,65	0,01
Canada	1,31	14,43	-1,04	-0,80	-0,05	-6,64	1,59	-0,10
Chile	-6,81	-11,13	17,24	-17,19	-5,52	-14,53	1,50	-0,01
Colombia	-2,97	-9,49	16,60	23,72	-10,78	-9,03	1,79	-0,03
Costa Rica	-0,70	1,71	3,52	-2,57	-6,81	-9,81	1,82	-0,07
Dominica	-3,24	1,52	26,41	57,87	57,17	-55,93	1,88	0,54
Ecuador	-4,80	-4,31	-30,21	4,13	-5,71	-0,17	1,60	0,08
El Salvador	-2,12	2,90	-6,09	-1,62	20,94	0,53	1,74	0,07
United States	1,12	5,42	-5,15	4,24	2,74	-9,73	1,64	-0,02
Grenada	9,88	-3,91	-0,14	48,31	18,99	-9,49		
Guatemala	-9,06	4,72	-10,28	2,61	-14,88	19,15	1,93	-0,03
Guyana	4,51	-8,27	7,85	-21,94	1,22	-16,55	1,70	-0,01
Haiti			0,00	0,00				
Honduras	-3,40	-11,33	18,68	-26,94	29,60	30,39	1,16	0,14
Jamaica	-3,48	-2,99	-6,79	-16,68	-6,88	-19,21	4,13	-0,17
Mexico	2,35	0,32	1,47	-6,51	-6,95	-0,28	1,92	-0,01
Nicaragua	-1,50	-1,07	6,55	7,62	-3,71	-19,03	1,44	-0,48
Panama	-0,19	7,01	-3,86	-15,42	7,21	-4,33	2,63	-0,12
Paraguay	0,91	1,94	6,61	-6,18	10,17	-30,89	1,25	-0,12
Peru	-4,38	-3,52	11,28	-4,29	-11,20	-14,01	1,35	-0,21
Dominican Republic								
Saint Christopher and Nevis	-27,18	60,86	-13,59	49,38	-7,92	86,02	1,59	0,00
Saint Vincent and the Grenadines	-1,12	-7,55	8,57	-40,14	-10,11	-3,84	3,48	0,39
Saint Lucia	-11,88		96,10		-64,90			
Suriname			0,00	0,00				
Trinidad and Tobago	-10,52	-8,06	-28,75	19,31	-19,28	4,47	1,12	-0,20
Uruguay	1,31	5,28	6,82	-2,81	-3,37	-2,37	1,80	0,04
Venezuela (Bolivarian Republic of)	-19,26		-37,65		-24,24		1,17	

**Source:** IICA, based on official information from the United Nations (COMTRADE).  
Note: BRB, BRA, CAN, COL, CRI, SLV, GRD, PAN and VCT – the last period is 2005/08

**Table A.13. CUMULATIVE ANNUAL GROWTH RATE OF PRODUCTION, BY SECTOR, IN PERCENTAGES**

	Crops			Livestock			Agriculture			Forestry		
	2000-2005	2005-2007	2006-2007	2000-2004	2004-2005	2004-2005	2000-2005	2005-2007	2006-2007	2000-2005	2005-2007	2006-2007
Antigua and Barbuda	1,19	2,03	2,17									
Argentina	2,89	4,81	9,28	0,28	0,00	0,00	5,57	10,63	0,07	10,51	-2,80	0,00
Bahamas	4,02	-2,90	1,03				1,02			0,00	66,49	177,17
Barbados	1,47	2,98	5,46	1,22	2,97					11,92	22,10	49,09
Belize	2,12	-1,12	-0,48	14,60	-7,84		22,28	-16,03	0,95	0,00	83,04	292,43
Bolivia (Plurinational State of)	3,17	-0,28	0,24	2,54	0,71		3,74	28,12	56,10	4,73	0,48	0,48
Brazil	5,64	1,54	5,57	5,31	0,00		11,63	15,99	27,59	2,70	-2,21	2,46
Canada	2,59	-1,52	-1,32	0,86	2,97		4,40	16,18	-0,85	0,87	-2,83	-0,80
Chile	3,36	-1,33	-2,95	2,54	5,22		19,10	30,52	18,61	5,01	8,00	12,29
Colombia	2,74	-6,64	-1,19	4,01	0,04		2,47	0,02	0,00	-0,97	-1,88	4,14
Costa Rica	0,93	4,50	5,47	0,51	1,11		22,19	1,71	18,31	-3,68	5,87	-0,21
Dominica	-2,96	7,35	2,27							0,00	0,00	0,00
Ecuador	5,61	-0,30	-0,48	4,07	2,27		15,10	11,86	0,68	2,50	0,76	5,42
El Salvador	0,36	5,12	6,22	1,50	0,19		45,23	21,52	21,38	-1,67	0,11	0,11
United States	1,34	0,90	4,47	0,34	1,87		3,05	0,30	-4,10	0,37	-2,04	-2,79
Grenada	-4,32	14,88	5,12									
Guatemala	2,96	3,77	7,43				8,83	35,19	0,62	2,07	2,15	1,98
Guyana	-0,18	4,85	-0,80				0,29	5,39	0,00	2,75	1,43	-3,09
Haiti	0,16	-1,11	0,43							0,35	0,38	0,38
Honduras	6,56	2,68	2,69	24,98	0,53		23,10	8,38	2,79	0,15	-0,83	-1,16
Jamaica	-0,58	3,65	-0,56	0,27	0,00		11,53	-20,36	-38,96	-0,81	-0,39	-0,39
Mexico	2,12	3,79	1,61	2,30	0,89		8,86	11,12	1,01	1,15	4,02	0,96
Nicaragua	4,57	-0,35	1,92	4,79	1,45		6,64	5,55	-1,10	0,09	0,45	0,46
Panama	1,21	2,29	3,03	-0,31	1,47		38,29	6,76	0,99	-0,17	-0,47	-0,14
Paraguay	4,84	10,94	17,85	0,79	1,74		60,69	-0,28	0,00	0,45	0,98	0,98
Peru	3,71	4,59	2,29	4,01	1,55		34,10	30,93	55,51	0,33	2,96	2,75
Dominican Republic	4,45	4,40	-1,26	1,04	0,89		-3,77	0,05	0,00	-0,58	20,10	0,24
Saint Kitts and Nevis	-4,19	-2,03	6,93									
Saint Vincent and the Grenadines	1,82	1,78	2,36									
Saint Lucia	-3,08	6,50	7,27				25,81	-65,38	-89,70	0,00	0,00	0,00
Suriname	0,21	4,49	1,14	1,80	0,00		-17,73	-48,29	-72,40	-0,63	-3,52	-11,79
Trinidad and Tobago	0,38	0,83	1,49	8,24	0,49					-1,66	-0,22	-0,20
Uruguay	4,52	3,71	-2,93	0,64	5,57		-12,23	-5,89	69,49	18,04	10,12	9,51
Venezuela (Bolivarian Republic of)	-0,35	1,04	2,83	-3,52	3,45		5,68	0,00	0,00	3,38	8,63	4,07

Source: IICA, based on official information from FAO (FAOSTAT).

**Table A.14.** LAND USE IN THE AMERICAS, BY CATEGORY (1,000 HA)

Country	Total land area *	Total agricultural land (SAT)	Arable land and permanent crops* (CACP)	% CACP/SAT	Pasture and prairie land (SPP) *	%SPP/SAT	Wooded area *	Protected areas **
Anguilla	9,0	,,,	,,,	,,,	,,,	,,,	5,5	
Antigua-Barbuda	44,0	13,0	9,0	69,2%	4,0	30,8%	9,4	
Dutch Antilles	80,0	8,0	8,0	100,0%		0,0%	1,2	
Argentina	273 669,0	133 350,0	33 500,0	25,1%	99 850,0	74,9%	32 721,4	21 515***
Aruba	18,0	2,0	2,0	100,0%		0,0%	0,4	
Bahamas	1001,0	14,0	12,0	85,7%	2,0	14,3%	515,0	
Barbados	43,0	19,0	17,0	89,5%	2,0	10,5%	1,7	
Belize	2281,0	152,0	102,0	67,1%	50,0	32,9%	1653,0	800,6
Bermudas	5,0	1,0	1,0	100,0%	,,,	0,0%	1,0	
Bolivia	108 330,0	36 828,0	3828,0	10,4%	33 000,0	89,6%	58 199,6	17 066,9
Brazil	845 942,0	263 500,0	66 500,0	25,2%	197 000,0	74,8%	471 492,0	70 530,0
Caiman	26,0	3,0	1,0	33,3%	2,0	66,7%	12,4	
Canada	909 351,0	67 600,0	52 150,0	77,1%	15 450,0	22,9%	310 134,0	
Chile	74 380,0	15.762,0	1753,0	11,1%	14 009,0	88,9%	16 235,8	14 334,9
Colombia	110 950,0	42 436,0	3570,0	8,4%	38 866,0	91,6%	60 634,0	14 508,8
Costa Rica	5106,0	2750,0	500,0	18,2%	2250,0	81,8%	2397,0	1355,8
Cuba	10 982,0	6620,0	3991,0	60,3%	2629,0	39,7%	2824,2	330,9
Dominica	75,0	23,0	21,0	91,3%	2,0	8,7%	45,5	
Ecuador	27 684,0	7412,0	2415,0	32,6%	4997,0	67,4%	10 458,2	
El Salvador	2072,0	1556,0	919,0	59,1%	637,0	40,9%	287,6	41,6
United States	916 192,0	411 158,0	173 158,0	42,1%	238 000,0	57,9%	303 407,0	
Grenada	34,0	13,0	12,0	92,3%	1,0	7,7%	4,1	
Guadalupe	169,0	44,0	24,0	54,5%	20,0	45,5%	79,3	
Guatemala	10 716,0	4464,0	2514,0	56,3%	1950,0	43,7%	3830,0	3089,0
Fr. Guyana	8815,0	23,0	16,0	69,6%	7,0	30,4%	8063,0	
Guyana	19 685,0	1680,0	450,0	26,8%	1230,0	73,2%	15 103,5	

**Table A.14.** LAND USE IN THE AMERICAS, BY CATEGORY (1,000 HA)

Country	Total land area *	Total agricultural land (SAT)	Arable land and permanent crops* (CACP)	% CACP/ SAT	Pasture and prairie land (SPP) *	%SPP/SAT	Wooded area *	Protected areas **
Haiti	2756,0	1690,0	1200,0	71,0%	490,0	29,0%	103,4	
Honduras	11 189,0	3128,0	1428,0	45,7%	1700,0	54,3%	4335,2	3163,6***
Jamaica	1083,0	513,0	284,0	55,4%	229,0	44,6%	338,2	
Malvinas	1217,0	1118,0		0,0%	1118,0	100,0%	0,0	
Martinique	106,0	28,0	18,0	64,3%	10,0	35,7%	46,5	
Mexico	194 395,0	106 800,0	26 900,0	25,2%	79 900,0	74,8%	63 717,2	18 700,4
Montserrat	10,0	3,0	2,0	66,7%	1,0	33,3%	3,5	
Nicaragua	11 999,0	5200,0	2184,0	42,0%	3016,0	58,0%	4979,0	
Panama	7434,0	2230,0	695,0	31,2%	1535,0	68,8%	4288,8	
Paraguay	39 730,0	20 400,0	4400,0	21,6%	16 000,0	78,4%	18 117,8	5739,2
Peru	128 000,0	21 560,0	4560,0	21,2%	17 000,0	78,8%	68 553,6	18 749,5***
Puerto Rico	887,0	189,0	99,0	52,4%	90,0	47,6%	408,4	
Dominican Rep.	4832,0	2517,0	1320,0	52,4%	1197,0	47,6%	1376,0	1052,9
S Pedro Miquel	23,0	3,0	3,0	100,0%	,,,	0,0%	3,0	
Saint Vincent	39,0	14,0	12,0	85,7%	2,0	14,3%	10,9	
St Kitts	26,0	5,0	4,0	80,0%	1,0	20,0%	5,3	
St Lucia	61,0	11,0	10,0	90,9%	1,0	9,1%	17,0	
Suriname	15 600,0	83,0	65,0	78,3%	18,0	21,7%	14 776,0	
Trinidad and Tob.	513,0	54,0	47,0	87,0%	7,0	13,0%	225,2	
Turks and Cai.	95,0	1,0	1,0	100,0%	,,,	0,0%	34,4	
Uruguay	17 502,0	14 683,0	1383,0	9,4%	13 300,0	90,6%	1544,8	
Venezuela	88 205,0	21 350,0	3350,0	15,7%	18 000,0	84,3%	47 137,8	64 860,3
Virgin (UK)	15,0	8,0	3,0	37,5%	5,0	62,5%	3,7	
Virgin (USA)	35,0	4,0	2,0	50,0%	2,0	50,0%	9,1	
Americas	3 894 456	1 197 258	393 443	32,9%	803 815	67,1%	1 528 150,8	
LAC + México	2 068 913	718 500	168 135	23,4%	550 365	76,6%	914 609,8	255 839,4

\* Source: FAO, FAOSTAT (year 2007).

\*\* Source: ECLAC, ECLACSTAT (2007; \*\*\* year 2006).

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