The Outlook for Agriculture and Rural Development in the Americas:

A Perspective on Latin America and the Caribbean

2015-2016

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Contents

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- Chapter on "Forests." Technical coordinator: Jorge Meza Robayo, with the collaboration of José Antonio Prado. Additional group members: Hivy Ortiz and Roberto Lisboa.

- Chapter on "Fisheries and Aquaculture." Technical coordinator: Alejandro Flores, with the collaboration of Jorge Chocair.

- Chapter on "Rural Well-being." Technical coordinator: Adrián Rodríguez, with the collaboration of Sinduja Srinivasan and Laura Póveda.

- Chapter on "Public Policies and Institutional Framework." Technical coordinator: Roger Norton and Hugo Chavarría, with the collaboration of Miguel García and Joaquin Arias. Additional group members: Eugenia Salazar, Diego Montenegro, Rafael Trejos, Manuel Otero, Carlos Pomareda, João Torrens and Ricardo Rapallo.

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Foreword

Although the US economy is showing signs of a strong recovery, economic growth in the Euro Area is sluggish, and the emerging countries (including China) are experiencing a slowdown. This situation will have a negative impact on Latin America and the Caribbean (LAC), a region that in 2015 is set to record its lowest economic growth rates since 2009. The downturn will be reflected in weaker growth in demand, which will affect exports of food and agricultural raw materials. Hardest hit by the deceleration will be the agriculture of the countries most dependent on the European Union and Asia (those in the Southern and Andean regions), and, to a lesser degree, the countries closest to the US, such as Mexico and those in Central America.

The outlook for production in LAC depends on a wide range of factors – not only planting and production decisions based on the market conditions of previous years (especially prices), but also the possible impact of pests and the weather on yields. For example, while favorable conditions in most of the countries of the Northern and Southern regions will make it possible to maintain high levels of production of grains and oilseeds, in Central America and the Caribbean climate factors and pests will negatively affect the production of staple grains, livestock, coffee and tropical crops, possibly leaving family farmers exposed and vulnerable.

In this, the sixth in the series of documents entitled "Outlook for Agriculture and Rural Development in the Americas," the Economic Commission for Latin America and the Caribbean (ECLAC), the Regional Office for Latin America and the Caribbean of the United Nations Food and Agriculture Organization (FAO), and the Inter-American Institute for Cooperation on Agriculture (IICA) analyze the trends in, and outlook for, the macroeconomic and sectoral contexts, agriculture, rural well-being, and policies and the institutional framework in the sector.

In each chapter, ECLAC, FAO, and IICA present recommendations for policies they believe are needed to enable the region's agriculture to regain its former buoyancy and to enhance the development of rural areas. In the particular case of this sixth document in the series, recommendations are made that are designed to mitigate the impact of the economic slowdown in agriculture, spur higher agricultural productivity in the region, foster the integrated management of natural resources, and facilitate the successful incorporation of family farmers, young people, and rural women into agricultural value chains.

Alicia Bárcena
Executive Secretary
Economic Commission for Latin America and the Caribbean (ECLAC)

Raúl Benítez
Assistant Director-General and Regional Representative for Latin America and the Caribbean
Food and Agriculture Organization of the United Nations (FAO)

Víctor M. Villalobos
Director General
Inter-American Institute for Cooperation on Agriculture (IICA)

Synopsis

Synopsis

Like the five previous reports, this edition of "The Outlook for Agriculture and Rural Development in the Americas," covering 2015-2016, is divided into the following four chapters:

Chapter I: Macroeconomic Context: The author analyzes the evolution and outlook for financial and macroeconomic markets, which determine the conditions in which agriculture in the Americas will have to operate.

Chapter II: Sectoral Context and Agriculture: The chapter begins with an analysis of the trends in the region's main agricultural aggregates (sectoral context), followed by the trends and prospects for the various subsectors (crops, livestock, fisheries, and forests).

Chapter III: Rural Well-being: Based on the household survey data of twelve Latin American and Caribbean (LAC) countries, the author discusses the situation of young people and rural women with regard to labor markets and access to assets, as well as income inequality in the rural milieu.

Chapter IV: Policies and the Institutional Framework: This section contains a review of the principal changes that have taken place in agricultural policies and the public institutional framework of the sector, both in the LAC region and among its main trading partners. It also outlines the challenges facing the region as it endeavors to achieve more competitive, sustainable, and equitable agriculture.

A synopsis of each chapter of the document is presented below:

Chapter I: Macroeconomic Context

The global economy has not yet recovered from the impact of the 2008 financial crisis. The global growth rate remained at 3.3% in 2014, unchanged from the previous year, and is expected to reach 3.5% in 2015. The expected growth rate for LAC, on the other hand, is the lowest since 2009, but with significant differences among sub-regions and countries. The lack of dynamism, or contraction, of some of the region's largest economies, especially in South America, accounts for the drop in the regional average.

The trends in some variables are the main reason for the region's performance. Trade and investment accounted for most of the slowdown, while capital flows and remittances maintained or increased their dynamism. External financing, especially in the form of government bonds, remains fluid, thanks to the low interest rates recorded across the globe in recent years, and the fact that the expected hike in US interest rates has not yet materialized.

The prices of LAC's commodity exports have shown a downward trend, leading to further deterioration in the terms of trade. The severity of the decrease has varied with respect to both the goods affected and the effect on the countries' terms of trade, however. The Central American sub-region, a net importer of oil and foodstuffs, should benefit especially from this trend, providing a boost to gross domestic product (GDP) in 2015 and 2016.

The collapse in oil prices followed four years of stable prices. The value reached in January 2015 was the lowest since the spring of 2009, when the financial crisis was at its height. Several of the regional economies that finance

part of their public spending with income from state-owned oil companies will have to contend with the effects of the sharp drop in prices on their tax revenues. On the other hand, falling prices have had—and will continue to have—a positive effect on the fiscal variables and rates of inflation and growth of the region's oil-importing countries.

In spite of the good prospects for global growth thanks to falling oil prices, markets continue to be affected by uncertainty about how long energy prices will remain low, making them susceptible to volatility. In addition to that uncertainty, the growth prospects of Europe and China are major concerns. The growth forecasts for Brazil and Argentina, two of the region's biggest economies, were revised downwards, due not only to the effect of the fall in commodity prices but also to internal and external weaknesses. That has a knock-on effect on other economies in the region, via trade and investment. The slowdown in Venezuela may also have a negative impact on the economies of Latin America and, in particular, the Caribbean, which benefit from preferential bilateral trade and investment arrangements with that country.

Chapter II: Sectoral Context and Agriculture

i. Sectoral Context

The annual rate of growth of LAC's agricultural sector in the last three years was 2.9%, higher than the figure of 2.6% for the wider economy. Essentially, this was due to the outstanding performance of agriculture in 2013, when it grew by 5.5% over the previous year, more than twice the growth of the economy in general (2.5%).

The growth of LAC's agricultural sector was largely due to higher productivity. The most recent calculations suggest that the volume of agricultural production grew at an average annual rate of 3.2%, with increases in productivity accounting for 2.2% of the total and the expansion in the use of resources (one percentage point) for the remainder. However, this chapter highlights significant differences in productivity and the use of resources among the countries of the region.

With regard to trade, most of LAC's local currencies have experienced a reversal of the situation that prevailed in recent years, with the trend now being towards devaluation. In the period 2012-2014, the US dollar appreciated by an average of almost 2%, which, of course, was reflected in a depreciation (in real effective terms for the agricultural sector) of the currencies of most LAC countries, regardless of their trade structure. The analysis presented in this chapter considers the variation in exchange rates and inflation in each country of the region with respect to that of their most important agricultural trading partners.

The devaluation of local currencies is expected to be beneficial in a context of sluggish LAC agrifood exports. In 2011-2013, the average annual increase in world agrifood exports was only 2.4%, with those of LAC posting a historically low rate (an average of 1.9% per year). Although in 2013 LAC showed signs of economic recovery with growth of 3.9% over the previous year, the figure was still moderate when compared with the global rate (5.6%).

The sluggishness of LAC agrifood exports was mainly due to a slowdown in global demand for agrifood imports, which grew by only 2.5% annually over the previous three years, a much lower figure than in the previous decade (11%). In this scenario of a deceleration in imports, LAC is one of the regions of the world whose food imports have slowed the most. In fact, in terms of long-term growth (10-year period), LAC is the region with the biggest fall in agrifood imports (more than 8%), followed by Asia (excluding China), with 7.7%.

In addition to the slowdown in international demand, it is forecast that in the next decade the positive long-term trend in international food prices observed over the last 15 years is going to be reversed and become negative. Although prices remain high in real terms compared to the 2002-2004 base period, by March 2015 they had fallen 26.6% from their high in December 2010, and are expected to continue to decline.

Finally, in this chapter it is proposed that higher agricultural productivity is LAC's best way to achieve the sustained, stable growth of the agricultural sector, especially given the anticipated slowdown in global demand for agrifood products (which will affect the growth prospects of LAC's production and exports) and the possible end of the super cycle in agricultural prices.

ii. Agriculture (Crops)

During 2013 and 2014, large volumes of cereals and oilseeds were produced in the Americas, with production of some specific crops even setting new records. This was made possible by good climate conditions, as well as an increase in the area planted with the crops in the countries in the northern and southern subregions of the Americas, prompted by an improvement in the relative prices paid for them. Conditions varied in other parts of the continent, however. In Central America, for example, drought conditions led to heavy cereal losses, while coffee production was badly affected by the leaf rust outbreak across the region.

In addition to the impact on agricultural production of the adverse climate conditions and pests and diseases during the years mentioned, LAC had to contend with increased competition in international markets as a result of the rapid growth in agricultural output in some Asian and African countries. Higher yields, the incorporation of new land, and cheap labor enabled countries such as Viet Nam, the Philippines, Ghana, China, and Ivory Coast to overtake, and in some cases even double, LAC's production and exports of fruits (banana and pineapple), tubers (cassava), coffee, and cacao.

Despite these circumstances, the countries of the region have made major efforts not only to raise agricultural productivity, but also to increase the value added of their agricultural products and improve their marketing channels. The incorporation of technologies and innovations has been the main reason for the improvement in productivity. For example, the higher productivity achieved by commercial agriculture in the last two years was associated with the utilization of genetically modified organisms (GMO), increased use of zero tillage technologies, production under controlled environments, and, to a lesser degree, the incorporation of various information and communication technologies (ICT). Significant increases in productivity were also achieved by the region's family farmers, thanks to the gradual incorporation of new technologies and varieties of crops that are more resistant to pests, diseases, and abiotic factors.

Furthermore, farmers have become more aware of climate change, and of the need to produce using more environmentally friendly methods. This has resulted in greater use of bioinputs, which, while not yet widespread, will be one of the trends in coming years. With regard to value added and marketing processes, numerous countries in the region have made serious efforts to position themselves in the markets of healthy products, as well as highly nutritious or gourmet fruits and vegetables. In doing so, they have not only achieved a rapid increase in the production of organic products and crops that offer supposed health benefits (herbs, quinoa, chia, etc.), but have also constructed value added strategies based on differentiation by origin, the type of technologies employed, the people involved in the production process, and the environmental impact of the production system, among other factors.

To maintain and increase competitiveness in national and international markets, the countries will have to continue with the efforts to strengthen national innovation systems; promote value added and differentiation based on environmental, territorial, or cultural factors; and strengthen family agriculture's links with markets by promoting business skills, the development of alternative markets and marketing channels, improvements to risk management programs and instruments, and capacity building to make it possible to comply with new trade standards.

iii. Livestock

Global demand for meat, eggs, and dairy products is expected to rise substantially by 2050. Much of the growth in the demand for animal protein is set to come from developing countries, as they urbanize and disposable incomes rise.

LAC currently produces more than 25% of the world's beef and over 20% of its poultry. The focus of meat production in the Americas is increasingly shifting toward South America (and Brazil in particular), as livestock herds in the US continue to decline and struggle to recover following several years of devastating drought.

Growing livestock inventories and more efficient production continue to drive meat and milk production in LAC. Three countries account for 50%-70% of livestock inventories in LAC, and the top five producers for 70%-80%. LAC beef exports have doubled, while exports of pork and poultry by Brazil and Chile have quadrupled over the last decade.

The recent fall in the prices of oil and feed grains is facilitating a shift in the LAC livestock industry towards more intensive forms of production. High-income countries are using innovative, proven livestock production technologies to improve food security, the economy and environmental sustainability. In LAC, however, apart from some notable exceptions, such know-how is not being harnessed to the full, since extension and technology innovation systems are very weak, and family farmers' access to technology and rural services is very limited.

With regard to animal health, it is estimated that around 85% of South America's cattle population is now recognized as free of foot-and-mouth disease. Major challenges lie ahead, however, given the need to improve epidemiological surveillance systems in a context of climate change, as well as integrated animal health management, the health of ecosystems, and public health, under the "One Health" approach.

iv. Fisheries

The global demand for fish products is growing, placing greater pressure on the main fisheries. LAC is no exception. Consumption of fish and shellfish in the region has increased considerably in recent years, with countries like Brazil, Peru, and Mexico recording figures above the world average. Consumption is being driven by greater awareness of the importance of eating healthy products, and the growing presence of products that are less exclusive and more affordable. With adverse environmental factors compounding the situation and leading to a marked decline in the amount of product being caught, there is an urgent need to develop tools for applying the ecosystem management approach within the fishing industry. This is especially important bearing in mind that fishing is the livelihood of a sizeable percentage of the LAC population. Small-scale fishing is a sort of "family insurance policy" that people in the region fall back on when agricultural harvests are poor and rural employment hard to come by.

Aquaculture continues to record the highest rate of growth of primary activities in LAC, making a growing contribution to domestic economies. In the last thirteen years, LAC aquaculture production posted its highest percentage of growth ever (71%). In addition

to accounting for an increasingly large share of agrifood exports (Ecuador's exports, for example, were worth nearly USD 1.6 million in 2014), micro and small-scale aquaculture is growing and complementing family farming.

Although aquaculture activity in LAC has benefited from the advances made by research and development (R&D), further investment will be needed in that area if sustained and sustainable growth is to be achieved. The LAC countries should also strengthen the institutional capabilities for regulating fishing, at both the national and local levels, if the activity is to be organized in such a way as to ensure the sustainable use of fishery resources and the sustainable development of aquaculture. A robust institutional framework is required, with regulations that ensure that fishing and aquaculture activities are carried out in a consistent, sustainable and responsible fashion.

One of the greatest challenges facing the region's fishing industry is climate change. The impact it is forecast to have on the region makes it essential that the countries address the issue in a consistent and responsible way. As phenomena associated with climate change occur, governments will need to make the issue a permanent part of their agendas, implement adaptation measures, and take decisions to tackle the direct changes and their externalities.

Regional cooperation should be a key element in addressing these challenges. Identifying good practices and sharing lessons learned will ensure that the management and sustainable use of fisheries and aquaculture takes into account the principles and pertinent standards of the Code of Conduct for Responsible Fisheries of the United Nations Food and Agriculture Organization (FAO).

v. Forests

Deforestation and forest degradation are one of the most important environmental problems facing LAC, and one that seriously affects the livelihoods of millions of people. The countries of the region are making major efforts to address the problem. During the period 2010-2015, the annual rate of deforestation in the region was 2.2 million hectares, a reduction of 1.4 million hectares over the previous five years.

The main causes of deforestation are the preparation of land for crop and livestock production and land tenure problems. While land settlement on small properties continues to be a major cause of deforestation in many Central American countries, in South America the preparation of large swathes of land for extensive livestock production and mechanized agriculture is the principal cause.

A number of initiatives designed to address the issue of deforestation are under way. These include the REDD+ projects aimed at reducing deforestation and forest degradation within the framework of the United Nations Convention on Climate Change, and others aimed at promoting the conservation and sustainable management of forests.

Family farming and community forest management are gaining importance in several countries of the region. Strengthening these areas helps reduce rural poverty and the deforestation and degradation of forest ecosystems. International climate agreements should also contribute to the efforts to solve this problem. The implementation of REDD+ projects can bring about an important shift in the management and conservation of the region's forest resources.

Many countries are implementing agro-environmental policies as part of planning processes that integrate agriculture with other productive and conservation activities, strengthening family farming and the agriculture practiced by traditional peoples and communities. The agricultural and forestry activities carried out by rural communities are assuming greater importance, resulting in lower rates of deforestation, and progress being made toward the sustainable management of

forest resources. Nevertheless, it is important that countries correct any policies, instruments, and legislation that tend to foster deforestation, and continue their efforts to settle disputes over land tenure.

Chapter III: Rural well-being

This chapter considers the changes in rural well-being that occurred in LAC between roughly 2000 and 2012, with emphasis on income inequality, women and young people. The analysis draws on a household classification that is based on patterns of employment identified in household surveys conducted in the region. Based on the primary occupation of heads of household, the classification identifies six mutually exclusive types of household: 1) salaried agricultural households, 2) salaried non-agricultural households, 3) employer households, 4) own-account agricultural households, 5) own-account non-agricultural households, and 6) inactive households.

The data once again confirms that a transition is under way in the LAC countries, from agriculture to non-agricultural activities. In nearly all the countries considered, the number of households linked to the agricultural sector shrank, possibly due to the presence of very young skilled workers faced with a dearth of productive employment opportunities in agriculture, the skills mismatch or outdated skills of older workers owing to technological advancements in agriculture, or older household heads aging out of agriculture. In the same period, the countries experienced an increase in the proportion of households that engage in salaried non-agricultural activities. However, the transition was not continuous: many households moved to the "inactive" category, probably while their members sought opportunities for non-agricultural employment or acquired new skills.

Other important trends include: a) a significant reduction in poverty and income inequality, probably driven by recent social policies; b) an increase in the share of rural female household heads, especially women under 35 years of age; c) a growing tendency for older women to leave the formal labor market and participate in more informal activities in the agricultural and non-agricultural sectors; and, d) a decline in employment rates among the rural population under 25 years of age, among whom unpaid family employment is the dominant category, probably related to skills acquisition because they spend more time in the education system.

The results provide further support for recommendations discussed in earlier reports regarding the importance of policies to promote diversification of the rural economy (to create more employment) and skills acquisition (to take advantage of new employment opportunities). Policies intended to foster economic diversification should help to create adequate conditions for undertaking new productive activities, build capacities in the rural population, create the correct incentives and opportunities for young people to remain in the school system, and stimulate higher productivity family farming segments. Skills acquisition enables people to adopt new technologies and innovations and access higher-paying jobs, and facilitates the modernization of production. The analysis also suggests that social programs need to be maintained to avoid undermining the achievements made in reducing poverty and income inequality.

Chapter IV: Policies and the Institutional Framework

In recent years, the LAC countries have made important efforts to increase competitiveness and boost agriculture's participation in international markets, while at the same

time striving for inclusive development, the sustained management of natural resources, and greater adaptation to climate change, for which they have devised and implemented policies, programs, and strategies in three areas:

i) Equity and increasing smallholder incomes: Most LAC countries have adopted two main approaches to help smallholders. On the one hand, they have endeavored to strengthen the human and social capital of the poor through assistance programs, access to basic needs and education, construction of rural infrastructure, access to productive assets, etc. At the same time, they have implemented policies to assist poor producers to link themselves with actors and institutions that afford them more favorable access to higher-value markets. The most important focus on aspects such as entrepreneurial skills development, value-added programs, and the promotion of alternative marketing circuits.

ii) Productivity and competitiveness: In recent years, more competition with other productive regions and pressure to raise production levels more rapidly have resulted in practically all the countries of the Americas implementing policies aimed at promoting innovation and the incorporation of technology into agriculture, increasing private investment in rural areas, establishing programs for the management of (mainly) productive and climate risks, and promoting linkages with multinational companies and exports to higher-value international markets.

iii) Environmental sustainability: Although most of the issues related to this area lie outside its remit, the public institutional framework of LAC agriculture has stepped up efforts to promote the adaptation of agriculture to climate change, soil management, and the use of agricultural practices that have a lower environmental impact, among others.

Achieving competitive, sustainable, and equitable agriculture calls not only for the efforts of the public institutional framework for agriculture, but also those of other ministries and private enterprise. In addition to continuing to work on each category of the previous policies (financing, innovation, infrastructure, value chains, risk management, etc.), it is necessary to construct mechanisms that would permit greater interinstitutional coordination and the application of a participatory approach in devising, drafting and implementing policies for agriculture.

Chapter 1: Macroeconomic Context

Macroeconomic Context

As a region, Latin America and the Caribbean is facing the lowest growth rate since 2009, with external aggregate demand weakened by the slowdown in emerging economies, especially China. Although the fall in oil prices improves the economic prospects, more stimuluses and policies are needed to overcome the structural barriers to growth and achieve takeoff of the global economy.

Facts

- The global economy has not yet recovered from the 2008 financial crisis and its effects. The financial institutions predict that in the 2015-2016 biennium the overall growth rate will be higher than in recent years, but still below pre-crisis levels.
- The prospects for 2015 and 2016 suggest an improvement in the growth of the advanced economies and a slowdown in emerging economies, compared to 2014. Emerging economies will continue to account for most of global growth.
- In the best scenario forecast for the global economy in 2015, the slow growth expected in the Euro Area would not hold back the recovery in the United States (US). China, on the other hand, and despite its slowdown, would continue to grow at close to 7% a year. A deeper crisis in the Euro Area cannot be ruled out, however, and the resulting contraction in international trade would impact global growth.
- The advanced economies have shown a greater capacity for recovery but their growth rate is still limited. Since those economies account for the bulk of international trade, the exchange of goods among countries remains at levels well below those of the pre-crisis period.
- Due to the slowdown in emerging economies, especially China, Latin America and the Caribbean (LAC) is faced with weaker external aggregate demand. On the other hand, countries that export mainly to the US have benefited from faster growth.
- One of the greatest uncertainties in the 2015-2016 biennium will be the economic and geopolitical effects of low oil prices, both within producing countries and in their relationship with partners, and within oil-importing countries.

Trends

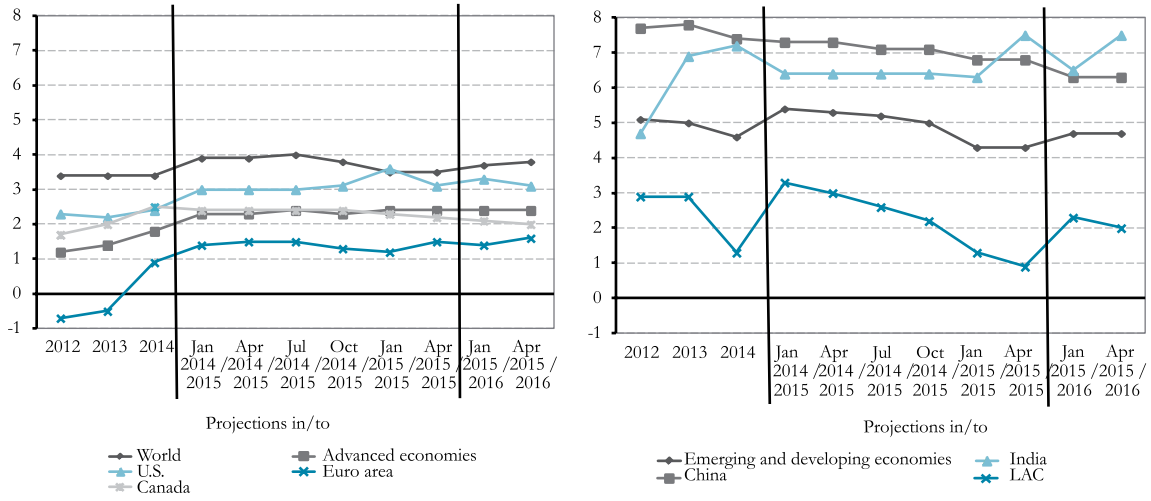
Global growth remains stable, but with differences among countries and regions

The growth of the world economy has remained relatively stable in the last two years, with variations in developed country performance and a slowdown in emerging economies. While the US and the United Kingdom have shown clear signs of recovery, the Euro Area has been on the brink of economic recession and deflation. Japan, despite having shown signs of recovery in early 2014, fell into recession in the final months of the year. The growth in emerging and developing economies continued to slow but still stands at well above the levels of advanced economies. The decline in the rate of growth in China and the greater dynamism of India's economy stand out (Figure 1). The first months of 2015 brought better prospects for advanced economies, which benefited from falling oil prices, low interest rates and, in the case of the European countries and Japan, the devaluation of their currencies against the US dollar. Emerging economies, however, are having to contend with two adverse factors: the slowdown in some of the biggest countries –China, Russia, and Brazil– and the weight of the oil-exporting countries within the group.

The global growth rate remained at 3.4% in 2014, unchanged from the previous year, and, according to the International Monetary Fund (IMF), is expected to reach 3.5% in 2015. The growth of the advanced economies has varied considerably. The UK's product, for example, grew by 2.6% in 2014 and is expected to rise by 2.7% in 2015. The US economy, meanwhile, is expected to grow by 3.1% in 2015, up from 2.4% in 2014. In 2015, Canada should repeat its performance the previous year, with only a slight slowdown (2.2% versus 2.5%). In the Euro Area, growth in 2014 was limited but positive (0.9%) and should reach 1.5% in 2015. However, there are sharp contrasts: acceleration in Spain and France, an unchanged growth rate in Germany, and a slight recovery in Italy, following three years of shrinking economic activity. Finally, growth in Japan should reach 1% in 2015 following the downturn (-0.1%) in 2014.

In the case of emerging and developing economies, average growth reached 4.6% in 2014 and should fall back slightly (4.3%) in 2015. The reduction in China's growth rate– from 7.8% in 2013 to 7.4% in 2014 and a likely 6.8% in 2015–shows a clear trend. LAC's rate of growth also slowed significantly in 2014 (1.3%) and is expected to continue to fall in 2015 (0.9%). These two figures are the lowest growth rates recorded since 2009, when regional gross domestic product (GDP) shrank by nearly 2%. In contrast, other developing regions such as the Middle East/North Africa and Sub-Saharan Africa now are more buoyant, with the growth rates for 2015 put at around 3.0% and 4.5%, respectively.

Figures 1a and 1b. Growth rates and projections of gross domestic product (GDP) in major advanced and emerging economies (%)



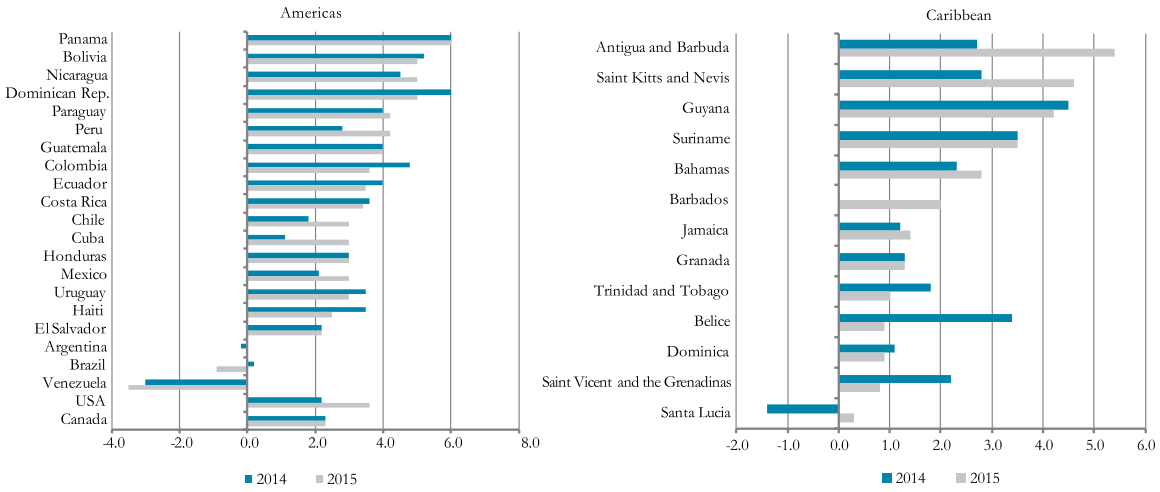
Source: Author's own elaboration, based on IMF data.

In Latin America and the Caribbean (LAC) the growth rate expected in 2015 is the lowest since 2009, with significant differences among the sub-regions

The average expected rate of economic growth for LAC as a whole (0.9% according to the IMF, 1.0% according to the Economic Commission for Latin America and the Caribbean–ECLAC) is the lowest since 2009. A detailed analysis of countries in the region, however, shows that there are significant differences in economic growth rates among the sub-regions and countries. While in 2015 growth in South America will be zero, in Central America (excluding Mexico) the growth rate is expected to be 4.0%, the same as in 2013. In the Caribbean, the forecast for 2015 is 1.7% growth, better than the trend of previous years. At 2.8%, the median of growth rates in 2015 is similar to that observed in 2013. It is the lack of dynamism, or the contraction, of some of the region's largest economies, especially in South America–Venezuela (-3.5%), Brazil (-0.9%), Argentina (0.0%)–that accounts for the significant drop in average regional growth (ECLAC, 2015a).

Commodity exporting countries, especially in the South American sub-region, must contend with the slowdown in the demand for goods from Europe and China, resulting in stagnation in export volumes. Mexico, Central America and the Caribbean countries that mainly export services, on the other hand, are benefiting from the steady recovery in the US. In 2015, the economies with the best growth prospects in the region are Panama (6.0%), Antigua and Barbuda (5.4%), and Bolivia, Nicaragua and the Dominican Republic (5.0%) (Figure 2 and Table A.2).

Figure 2. Growth of GDP in the Americas and the Caribbean



Source: Author's own elaboration, based on data from ECLAC and IMF.

The prospects for regional growth in 2015 are based on a series of trends in domestic economic variables (investment, consumption, government spending, changes in the exchange rate) and external variables (growth rate of major trading partners, demand for, and prices of, raw materials) that have been evident since late 2014 and are still present in the first months of 2015. These trends are discussed in the following subsections.

Trade and investment accounted for most of the slowdown in regional economies

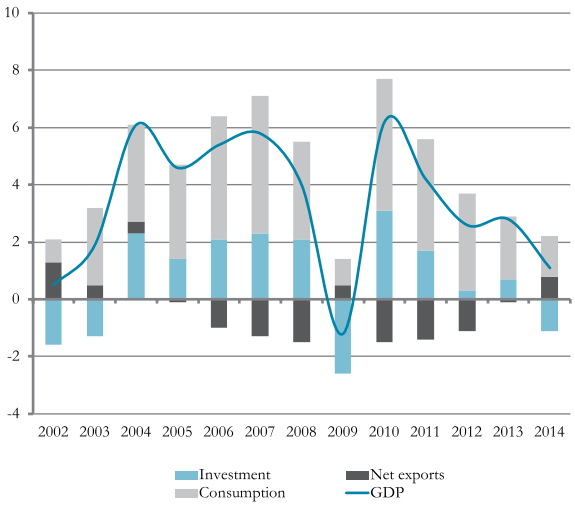
Figure 3 shows the trend in the main components of regional GDP in recent years. The fall in investment and consumption in 2014 was the sharpest since 2009. In the case of net exports, the positive result was due more to the contraction of imports than growth in exports. Indeed, the value of exports of goods and services from LAC as a whole remained stagnant in 2014, a result similar to 2013, when it grew only 0.3%. Following the global trend, the value of regional imports also shrank in 2014 for the first time since the financial crisis of 2008. In both cases there were marked sub-regional differences.

In the case of exports, Central America and Mexico benefited from the greater buoyancy of the US market, while countries in South America suffered from the slow recovery in Europe and the deceleration in China and other Asian countries. Therefore, the countries that rely heavily on the latter markets, such as Brazil and Chile, saw their exports stagnate; while other countries, such as Argentina, Bolivia and Venezuela, even experienced a decline in export values (ECLAC, 2014a).

Regional imports, on the other hand, were affected by the slowdown in consumption, which has been a key variable in previous years, and in investment, mainly in the South American

countries. On top of that, the conditions in international financial markets made exchange rates more volatile, resulting in the devaluation of currencies with flexible exchange rates in the region. That, in turn, made imports more expensive in local currency, which contributed to the slowdown (ECLAC, 2014a).

Figure 3. Latin America: rate of variation in GDP and contribution to GDP growth of domestic demand and net exports in 2002-2014 (in percentages and percentage points, based on dollars at constant 2014 prices)



Source: Author's own elaboration, based on data from ECLAC.

One of the main components of investment, gross fixed capital formation, shrank nearly 3% in the region in 2014, albeit with significant differences among countries. The variable increased more than 5% in many countries, including Bolivia, Colombia, Ecuador, Panama, and several Central American economies. In Argentina, Brazil, Chile and Venezuela, however, the trend was a major setback. In other economies, such as Peru, gross fixed capital formation continued to grow at positive rates but considerably more slowly than in previous years. This resulted in a decrease in the rate of regional investment (19.2% of GDP) and weak employment generation, especially wage employment (ECLAC, 2014a).

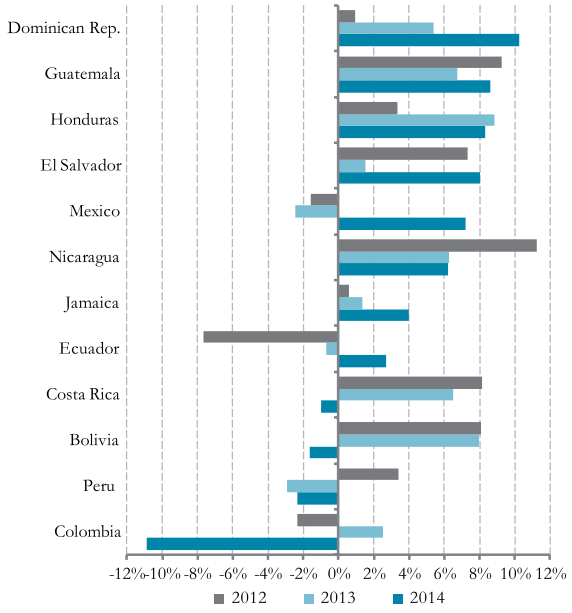
Capital flows and remittances remained robust or even grained strength in the economies of the region

External financing, especially in the form of government bonds, remains fluid in the region. Thanks to the low interest rates recorded worldwide in recent years, public debt in the region has not increased, despite the slowdown in regional growth, the fall in the prices of exports of raw materials, and the resulting drop in tax revenues. The expected increase in US interest rates has not yet materialized and conditions for international funding remained good in early 2015. Nonetheless, the overall fiscal balance (revenues minus expenditures, including debt servicing) of central governments in Latin America suffered a slight deterioration in 2014, with the deficit rising from 2.4% of GDP in 2013 to 2.7%, due both to the fall in total revenues and a slight increase in public spending. In the Caribbean, however, the overall deficit showed a slight improvement, falling from 4.1% of GDP in 2013 to 3.9% in 2014. In both sub-regions, the fiscal situation deteriorated significantly compared to 2009 levels: in Latin America, the average deficit in the period 2005-2008 was 0.25% of GDP, while in the case of the Caribbean it reached 2.1% (ECLAC, 2014a).

Bond issues ensured that LAC's international reserves rose in 2014. This occurred despite certain factors that depressed the level of reserves: firstly, central banks intervened to mitigate the volatility of exchange rates through auctions of foreign currency; and, secondly, foreign direct investment (FDI) fell by 25%-30%, associated with the end of the investment cycle in mining and a slower pace of acquisitions in the region by foreign investors (ECLAC, 2015b).

Remittances also played a role in maintaining the level of foreign exchange reserves in the region, although they did not increase across the board but rather were restricted to countries whose remittances mostly come from the US. The largest increases in remittances in 2014 took place in the Dominican Republic, Central America (Guatemala, Honduras, El Salvador) and Mexico, unsurprising given their strong economic ties with the US. This suggests that the recovery in employment in the US had a positive effect on remittances to Latin America (Figure 4). According to a World Bank study (2015d), remittances have played a key role in the economic recovery of developing countries since the most recent crisis, given their less pro-cyclical behavior compared with other sources of external transfers (such as FDI or portfolio investment) and their major impact on consumption, because they are non-repayable transfers to mostly low-income households that have a high propensity to consume.

Figure 4. Rate of variation in inflows of remittances from migrants abroad



Source: ECLAC, based on official figures.

The region's terms of trade continue to deteriorate due to the fall in the prices of raw materials

The prices of the raw materials exported by the region have shown a downward trend, especially in the second half of 2014. However, the severity of the decrease varied among different goods. The international prices of all raw materials (food, energy and metals) fell by an average of roughly 10.5% in 2014 compared to the previous year. Metal prices fell 2.3% in 2014; food prices fell 6.9%; and energy prices, about 17%. The trend in raw material prices was due to the slow recovery of developed economies and the recent slowdown in emerging economies, especially China, which has become the main global importer of raw materials and the most important trading partner of several countries in the region (ECLAC, 2014a). Another factor that has depressed prices in recent years is the increase in the supply as a result of investments made during the period of high prices.

Due to weaker external demand and the lower prices of some of the region's main export products, the terms of trade tended to deteriorate. With differences among economies in the region, LAC's terms of trade deteriorated by about 2.6% in 2014. The sharp fall in oil prices in recent months has led to a further deterioration in the terms of trade of oil-exporting countries such as Mexico, Bolivia, Colombia, Ecuador, Venezuela and Trinidad and Tobago, where the reduction in the terms of trade accelerated in 2014. On the other hand, oil- and food-importing nations such as the Central American countries, Haiti, and the Dominican Republic benefited from the situation in the form of improved terms of trade. Such positive trends have not, however, been sufficient to offset the impact of falls in the prices of raw materials on the terms of trade of the region as a whole (ECLAC, 2014a).

The collapse in oil prices, following four years of price stability, has affected LAC in different ways

According to the World Bank, in January 2015 the price of oil stood at USD 47.1 per barrel, the lowest since the spring of 2009 when the financial crisis was at its height. The factors behind the decline include an increase in supplies due to new production techniques, and a drop in demand, especially from major consumers like China. The easing of geopolitical tensions in the oil-producing areas of the Middle East improved the outlook for supplies, and the strength of the US dollar, which made oil imports more expensive and depressed global demand, also contributed to the drop in prices.

Oil remains a valuable geopolitical asset. Because of their high dependence on oil assets, countries like Russia, Iran and—in the case of Latin America—Venezuela will experience significant turbulence as a result of the collapse in oil prices. Those countries urgently need to cut public spending and review their geopolitical positions. They could also face serious economic and social crises. Other economies in this region, such as Mexico, Brazil, Argentina and Colombia, whose revenues from national oil companies support the funding of recurrent and social expenditure, will also have to contend with the impact of the sharp drop in oil prices on the public budget.

One of the primary consequences of the fall in oil prices for regional economies has been the weakening of state-owned oil companies. Comparable indicators of market value are available for listed companies such as Petrobras (Brazil), YPF (Argentina) and Ecopetrol (Colombia), and the figures for the second half of 2014 and early 2015 are striking. Between September 2014 and February 2015, the market value of these companies fell 40% (YPF), 57% (Ecopetrol) and 69% (Petrobras). In the latter case, the effects of the fall in oil prices on the level of capitalization were exacerbated by the cases of corruption that have surfaced over the past year. Lower oil prices are not good news for the Mexican economy either; the country is in the process of opening up its energy sector and the price per barrel is a key variable for the viability of future investment projects.

On the other hand, falling prices have had, and will continue to have, positive effects on oil-importing countries in the region. World Bank estimates (2015b), based on previous episodes of falling oil prices, suggest that a reduction of about 30% in the price of oil would lead to an increase in global GDP of about 0.5% in the medium term. Such a development would be subject to various conditions, however, such as the origin of the shock (supply or demand), the energy intensity of the economic activity (which has tended to decline over time), and the demand response to an increase in real income (if the surplus goes to consumption or savings). In the case of oil-importing countries, estimates suggest that a 10% reduction in oil prices would have a positive impact on GDP of between 0.1 and 0.5 percentage points, depending on the weight of the imports in GDP. Moreover, the transmission of international prices to domestic energy markets varies from country to country due to, among other factors, different tax structures, which also affects the final impact on economic activity.

The reduction in oil prices also helped rein in inflation in importing countries. In LAC, average inflation was higher in 2014 than in 2013 in most countries (Table A.3), due to both rising food prices and an increase in core inflation. Food prices showed a marked upturn from May 2014, while during the first half of the year core inflation accelerated in most countries. In Argentina and Venezuela and, to a lesser extent, Chile, Paraguay, and some Caribbean economies (Bahamas, Belize, and St. Lucia), consumer prices rose faster in 2014 than in 2013. Lower international prices of raw materials, including food as well as oil,

could help keep regional inflation in check in 2015. However, the negative effects of falling prices on the economies of countries exporting those goods—Argentina and Venezuela being two of the largest—could lead to a greater volatility of foreign exchange earnings, which would increase their external vulnerability.

Outlook

The forecasts for the growth of the world economy in 2015 and 2016 have been adjusted downward

The growth forecasts for the global economy produced by the major international organizations[1] have been adjusted downwards since mid-2014, when several factors converged to create an unfavorable scenario for growth (Figure 1). As a result, the world's leading economies—China, the countries of the Euro Area, USA, Japan, Russia and Brazil—had their growth prospects adjusted downwards.

In China, the decision of policymakers to respond more moderately to the signs of economic slowdown had a negative impact on the level of investment in the country and on its medium-term growth prospects. With policies leading to lower demand and depressed international prices of raw materials, the growth prospects of other emerging and developing countries, in Asia, LAC, and other regions, have also been affected.

In the countries of the Euro Area, the persistent stagnation, low inflation and high leverage remain a concern, leading to the downgrading of the outlook for the years ahead. Those adjustments, made in late 2014 and early 2015, did not take into account the possible impact of the plan for quantitative easing (QE)[2]announced by the European Central Bank (ECB) in late January 2015, which includes the purchase of treasury bonds and private assets costing over one billion euros, spread over 16 months. It also provides for the continuation of the scheme beyond that date, if inflation does not approach the ECB target, a rate of 2% per year, in the medium term.

In Japan, the contraction in 2014 (-0.1%) was well below expectations and, similar to what occurred in other regions, exports remained stagnant despite the depreciation of the yen, reflecting weak global demand. The country has also had to contend with the cost of rising energy imports due to the closure of nuclear reactors. However, falling oil prices are expected to offset this trend, aiding the Japanese recovery in 2015 (World Bank, 2015a). After the 2012 QE plan[3] proved insufficient to sustain the recovery of the Japanese economy, the central bank announced additional monetary stimulus in order to expand the debt to 70% of GDP, to boost growth and prevent a slowdown in inflation. These measures are expected to have a positive effect, and growth in Japan should be stronger in 2015 and 2016 than it was in 2014.

In the case of Russia and other oil-exporting countries, the historic drop in oil prices that occurred in the last months of 2014 and in early 2015 has led international organizations to significantly adjust growth prospects downwards. Other factors have also contributed, such as the continuing geopolitical tensions (with their economic consequences), the trade sanctions imposed by the European Union (EU) and the US due to the conflict with Ukraine,

1 IMF, World Bank and Department of Economic and Social Affairs (UN DESA). See Table A1 for the forecasts.

2 To carry out QE, central banks create money by buying securities, such as government bonds, from banks, with electronic cash that did not exist before. The new money swells the size of bank reserves in the economy. Like lowering interest rates, QE is supposed to stimulate the economy by encouraging banks to make more loans. The idea is that banks take the new money and buy assets to replace the ones they have sold to the central bank. That raises stock prices and lowers interest rates, which in turn boosts investment. Today, interest rates in the countries that have implemented QE plans are probably lower than they would have been without them. If the plan convinces markets that the central bank is serious about fighting deflation or high unemployment, then it can also boost economic activity by raising confidence. For example, several rounds of QE in the US have increased the value of the assets of the Federal Reserve from less than USD 1 trillion in 2007 to more than USD 4 trillion now.

3 The monetary injection carried out by the Bank of Japan in 2012 was, at the time, one of the largest in the history of central banks. Designed to expand GDP and rein in deepening deflation, the monetary base of the economy doubled in a period of two years.

and the sharp depreciation of the ruble. The country also faces increasing domestic inflation and a shortage of products and inputs.

Two of the major regional economies, Brazil and Argentina had their growth prospects revised downwards, not only due to the effect of falling commodity prices, but also to a set of internal and external weaknesses, such as political tensions before presidential elections, corruption in government and public enterprises, delays in the completion of the reform agenda and, in the case of Argentina, the as yet unresolved dispute with the international investors of so-called "vulture funds". Because Brazil is an important regional importer, the slowdown in growth also affects other economies in the region via trade and investment. The slowdown in Venezuela may also affect the economies of Latin America, and especially the Caribbean, which benefit from preferential bilateral trade and investment arrangements with that country.

Mexico should enjoy stronger growth in the years ahead, due to its close trade ties with the US, whose economic expansion continues to gather pace, and the promotion of a series of reforms to improve productivity. However, the effect of falling oil prices, not only on current production levels but also on the prospects for future investment, should also be considered, especially in light of the recent energy reform. Indeed, the fall in international oil prices coincides with Mexico's implementation of a reform designed to deregulate gasoline prices within three years and increase private investment in the sector. But the sector's capacity to attract foreign investment depends largely on the level of oil prices, and prices are expected to remain low in coming years. It is estimated, for example, that at a price of less than USD 70-75 per barrel—and a price of USD 60-62 per barrel is anticipated for the end of 2015—could rule out deep water oil exploration projects, one of the main areas targeted by the reform.

International financial institutions regard the fall in oil prices as a positive development but also point to the possible risks

Not all economies will benefit equally from the increase in global growth forecast by the World Bank and the IMF as a result of falling oil prices, about half of one percentage point over the medium term. The two institutions predict that emerging economies should benefit more from the decline in energy prices than developed countries. This is because consumers in less advanced economies spend proportionately more on energy than their counterparts in advanced economies. Moreover, in less advanced importing countries, lower oil prices reduce inflationary and fiscal pressures, as well as contributing to the increase in disposable income and consumption.

If the two institutions' predictions that energy prices will remain low in 2015 and 2016 prove correct, a global redistribution of real income is to be expected, from oil-exporting to oil-importing countries, and from the energy sector to energy-intensive activities such as agriculture. The effects on agriculture would extend not only to production costs, due to lower fuel and agrochemical prices, but also to the opportunity costs of producing biofuels, which would be a less attractive investment in the context of low oil prices. At any event, during previous similar episodes of sharp falls in international oil prices, prices tended to remain low for several years afterwards (World Bank, 2015b).

In spite of the good prospects for global growth, and in particular for the situation of the less advanced oil-importing economies, uncertainty remains rife about how long energy prices could stay low. Such uncertainty makes for volatile markets, because of doubts about the ability of exporting countries to continue to grow and pay off their external debts, sharp changes in

the market values of oil companies, and the viability of future investments in the sector, including those related to renewable energy.

Such sharp, sudden falls weaken the fiscal positions of oil-exporting countries, with serious consequences for public and social spending, international cooperation, and, possibly, investment. The World Bank (2015b) estimates that the economies of Russia and Venezuela, as well as the exporting countries of the Middle East and North Africa, could see GDP fall by up to 2.5 percentage points for every 10% drop in oil prices. The slowdown has a knock-on effect on partner countries, for which the oil-exporting economies represent important markets. Finally, lower prices would not only make extraction in deep water less profitable, but also affect other innovative projects, such as shale gas and oil sand mining operations. In the long run, the cancellation or postponement of such investment projects could lead to a reduction in energy production, which would push up prices. In the short term, however, the sudden cancellation of this significant flow of investment would harm national energy companies and their major investors, i.e., taxpayers in producing countries, including those in Latin America.

The possibility that oil prices have fallen too far still cannot be discounted, and they may rebound earlier or more strongly than expected. This could occur, for example, if the supply response to low prices is stronger than expected, as would be the case if planned investments and projects were to be postponed indefinitely, or even canceled. At all events, it seems unlikely that prices will rise considerably, particularly in a scenario of economic slowdown accompanied by a sharp increase in the global oil supply and oil reserves like the one observed in recent years.

As well as the uncertain future of oil prices, doubts about Europe's growth prospects make it difficult to predict global growth

Certain factors are expected to boost European growth in 2015: falling oil prices, the devaluation of the euro, and the QE plans of the ECB for the economy of the Euro Area. Lower oil prices increase the disposable income of consumers and have a positive impact on domestic demand. Even if the devaluation of the euro does not benefit the bulk of Euro Area exports, it should still have a positive impact on growth in the short term through trade within the bloc. As the devaluation would make the countries of the Euro Area more competitive, it should have a broad impact not only on the most indebted economies of the monetary union, but also on their main trading partners, improving the conditions in their main export markets.

However encouraging the first two factors may be, neither is the result of policies implemented by the EU as a whole or individual countries, and so do not have the explicit objective of restoring growth within the bloc and, in any case, the situation could change at any time. In particular, while the drop in oil prices is a positive development—inasmuch as it stimulates demand—additional monetary and fiscal policies are needed to effectively boost demand in a context in which the gaps in GDP continue to be substantial, inflation is below target, and monetary policy remains constrained by zero lower bound rates (IMF, 2015).

On the other hand, the expansionary policy of the ECB was specifically designed to enhance the recovery of the economies of the Euro Area.

Nonetheless, and despite the expected positive impacts on demand, inflation and growth, the analysts of the bank and the other institutions that make up the European troika (the IMF and the European Commission) have warned that the benefits of QE may be considerable but, without national structural policies to accompany them, they will only be short term. And if those policies fail, QE would make only a limited contribution to the economic recovery of the countries of the Euro Area after its initial impact on market expectations.

The prospects of low prices of raw materials are not the only possible obstacle to the growth of emerging economies and LAC in the years ahead

In many emerging and developing economies that are exporters of raw materials, including several in LAC, the upturn in growth forecast recently by international organizations is weaker or taking longer than was forecast in late 2014. Data for the first half of 2015 has led the institutions to predict that the impact of falling raw material prices (and, in the case of the region's oil-exporting countries, the fall in energy prices) on the terms of trade and real incomes will depress the growth of those economies over the medium term more strongly than expected (ECLAC, 2015a, 2015; IMF; World Bank, 2015a).

The end of the super cycle of raw material prices has adversely affected many emerging economies. The projected growth of economies specializing in the production of primary goods, especially oil and minerals, has been cut the most. In the major economies that export raw materials, however, exchange rates have tended to depreciate since mid-2014, going some way to offset the fall in international prices through increased income from exports in local currency (see the chapter on the Context of the Agricultural Sector for an analysis of the evolution of the real effective exchange rate for agriculture). It should be borne in mind, however, that the prospects for each country reveal that the effect of falling raw material prices has been heterogeneous in LAC. The Central American sub-region, in particular, should benefit from this trend, with an acceleration of GDP in 2015 and 2016.

Due to the influence of large economies such as Brazil and Mexico, the prospect of low raw material prices is a major impediment to growth for LAC as a whole. The lower growth expected as a result of weak raw material prices has been exacerbated by greater international financial volatility. The volatility is due to i) expansionary monetary policies in the Eurozone and Japan, and ii) expectations of higher interest rates in the US. Furthermore, the expected growth rates of the biggest global economies may not materialize, which would increase market volatility. Emerging economies are particularly vulnerable to such volatility and capital flows may be affected. Such risks are exacerbated in oil-exporting countries, which are now more vulnerable to shocks due to growing current and capital account deficits.

Policy recommendations

It is challenging time for the global economy. Although low oil prices and their positive effect on real income are expected to boost growth, everything suggests that more stimuluses and policies are needed to achieve the takeoff of the global economy. The flatness of high- and medium-income economies would seem to point to the existence of deeper structural problems that call for far-reaching, long-term policies. The weakness of international trade, the geopolitical tensions caused by the fall in energy prices, and the risk of deflation in the Euro Area and Japan are other factors currently dragging down global growth.

Foster regional integration: The weakness of global trade since the financial crisis continues to undermine the contribution of exports to

growth. Therefore, although international trade remains a source of opportunities, countries' need to make bigger efforts to promote the competitiveness of their exports. Regional integration processes can boost aggregate demand, via trade integration, and enhance productivity and competitiveness through greater integration of production and infrastructure. In addition, regional cooperation can help strengthen the capacity of countries to cope with external shocks through integration and financial regulation (ECLAC, 2014a).

Increase investment in infrastructure: In LAC there is room to increase productive capacity and competitiveness through integrated infrastructure projects, developing synergies in public investment among different countries. That kind of investment boosts productivity while acting as an incentive to private investment. Increasing investment's contribution to regional GDP has two effects: in the short term, it boosts domestic demand and helps promote growth; in the long run, it makes it possible to balance the challenges of the economic cycle with the strengthening of regional development.

Maintain balanced public finances: The ability of countries to promote public investment depends on their fiscal situation and capacity to mobilize resources. As already mentioned, the average fiscal deficit in the region remained relatively stable and, except in the Caribbean, external and internal public debt is relatively low. Although non-tax revenues decreased, tax revenues rose, reflecting the tax reforms carried out recently in several countries in the region. As a result, LAC managed to maintain its spending and public investment levels as a percentage of GDP, in spite of the economic slowdown (ECLAC, 2014a). It is unclear, however, whether the countries will continue to be able to refinance the public debt—and thereby maintain spending levels—when the expected rise in international interest rates begins to materialize in coming years.

Reduce vulnerability to the prices of raw materials: The economic and political costs for exporting countries of the recent sharp drop in oil prices underscores the vulnerabilities of highly concentrated economic activities, when tax revenues and public spending are exposed to the volatility of oil and raw material markets. Moreover, developments in energy markets in recent months are a clear warning to oil-producing countries that the world's most efficient global producers, such as Saudi Arabia, are capable of discreetly manipulating prices.

Take advantage of the opportunity to overhaul energy policies: Importing economies that are benefitting from the fall in oil prices, including several Latin American countries, can take advantage of the positive momentum generated by the transfer of income from exporting countries to press ahead with structural reforms and discuss improvements to the tax instruments and subsidies currently in place in the energy sector. Cheaper oil eases inflationary pressures and reduces certain external vulnerabilities; it also creates opportunities for more manageable monetary and fiscal policies.

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Chapter 2:
Sector Analysis

Chapter 2.1
Context of the agricultural sector

Context of the agricultural sector

Sluggish demand for food and agricultural raw materials across the globe will affect the outlook for the growth of agricultural production and trade in Latin America and the Caribbean (LAC).

Facts

- Traditionally, agriculture in Latin America and the Caribbean (LAC) has attenuated the effects of economic crises. In the most recent case, it failed to do so, however.
- The volatility of the international prices of food and agricultural raw materials has fallen to pre-crisis levels.
- The growth of agricultural productivity in LAC is slowing.
- Long-term real agricultural prices are down by an average of one percent.
- Weaker global demand for food and agricultural raw materials affects the outlook for the growth of production and agricultural exports in LAC.
- Vulnerability (exposure, sensitivity and adaptability) to climate variability has increased, especially among small- and medium-scale farmers.

Trends

During the period 2010-2013, agriculture in LAC grew faster than the economy as a whole but more slowly than agriculture in other regions of the world

The annual rate of growth of agricultural value added (AVA in constant 2005 US dollars) for LAC during the period 2010-2013 was 2.9%, higher than the figure of 2.6% for the economy as a whole (i.e., gross domestic product, or GDP). Basically, this was due to the outstanding performance of agriculture in 2013, when it grew by 5.5% over the previous year, more than twice the growth of GDP (2.5%).

These indicators of growth may signal the recovery of LAC agriculture, based on the sector's performance over the long and medium term. Over a 30-year period (see Figure 5), AVA grew at a rate of 2.3%, below the figure for the average annual rate of growth of GDP (3%). Over the medium term (the last ten years), agriculture sector growth slowed to 2.1%, while the economy as a whole grew by 3.4%, widening the gap between the two. Agriculture's positive performance during the period 2010-2013 (and particularly in 2011 and 2013), coupled with the strong growth achieved in 2014 as indicated by preliminary data, suggest that the gap is narrowing and that the growth of agriculture could be returning to the same levels as those of the economy as a whole.

Figure 5. Gross Domestic Product (GDP) and Agricultural Value Added (AVA)

Source: CAESPA (IICA), with data from the World Bank (WDI).

During the period 2011-2013, the economy as a whole grew more than the agricultural sector in LAC, despite the fact that in other regions the sector grew much more strongly. For example, agriculture in low- and middle-income countries grew faster than in LAC—by 1.2% and 0.4%, respectively. From a longer-term perspective (the last ten years), the differences are even greater: LAC agriculture grew by an average annual rate of 2.1%, compared with 4.2% and 3.5% in the case of the low- and middle-income groups of countries, respectively. It is also important to note the differences between countries as far as the growth of agriculture in the region during the period 2011-2013 is concerned[4] (see Table 1).

The growth of LAC's agricultural sector is largely due to higher productivity, although significant differences across countries continue to exist

The gross value of agricultural production (GVP)[5] for LAC during the period 2006-2011[6] grew at an average annual rate of 3.2% (see Figure 6), with increases in productivity accounting for 2.2% of the total (see Box 2) and the expansion in the use of resources (one percentage point) for the remainder.[7]

Although data is not available for all the LAC countries, the growth in productivity of the agricultural sectors of Jamaica, Brazil and Peru was more than double the average annual rate for LAC as a whole (2.2%). However, there are significant differences with regard to the trend in the use of natural resources, capital and labor, which are discussed below.

4 In the World Bank database (n.d.), no data is available for Canada, Peru and Haiti, and the information for Venezuela, Jamaica, Barbados and the United States for 2013 has not been included.
5 The rate of growth of GVP in constant US dollars is a measure of volume.
6 Five years are used to ensure that the figures are not influenced by atypical years, considering that the last data available for TFP is for 2011.
7 Land, labor, livestock, machinery, fertilizers.

In a group of countries (Jamaica, Brazil, El Salvador, Chile, Venezuela, Mexico and Haiti), agricultural productivity rose faster than production, indicating a contraction in the amount of resources allocated to the sector[8] (labor, land, livestock, fertilizers, machinery, etc.).[9] The most extreme case is Jamaica, where total factor productivity (TFP) increased 6.7% and the volume of production grew by just 1.1%, which means that the use of resources allocated to the sector shrank by 5.6%. The fall in the use of resources is explained by annual reductions of 1.5% in available farmland and 1.4% in agricultural employment (Fuglie n.d.). Since higher production was accompanied by a fall in the use of resources, the productivity of labor rose by 11% (IFPRI, 2013). AVA per agricultural worker rose from USD 2368 to USD 2630 (constant 2004-2006 US dollars), while the productivity of land increased by 10% (up from USD 1120/ha. to USD 1231/ha.). In the other countries, in a situation similar to that of Jamaica, a much smaller but still significant contraction in the resources allocated to the sector took place: -1.5% per year in Chile, -1.3% in Brazil and -1.2% in El Salvador (Figure 6).

Table 1. Rate of growth of AVA, 2011-2013

Growth above LAC average			LAC (average)	2.9	▲
Honduras	6.8	▲	Growth below LAC average		
St. Lucía	6.5	▲	Uruguay	2.8	▲
Paraguay	6.2	▲	Costa Rica	2.7	▲
Grenada	6.1	▲	Brazil	2.4	▲
Belize	6.0	▲	Argentina	1.7	▲
Guatemala	4.7	▲	El Salvador	1.5	▲
Dominica	4.5	▲	Chile	0.6	▲
Bolivia	4.3	▲	Suriname	0.2	▲
Panama	4.0	▲	Decline		
Colombia	3.9	▲	Nicaragua	-1.5	▼
Mexico	3.6	▲	St. Kitts and Nevis	-1.8	▼
St. Vincent & the Grenadines	3.6	▲	Barbados	-5	▼
Dominican Republic	3.3	▲	Bahamas	-6.7	▼
Guyana	3.3	▲	Trinidad & Tobago	-12.4	▼
Ecuador	3.1	▲			

Source: CAESPA (IICA), with data from the World Bank (WDI).

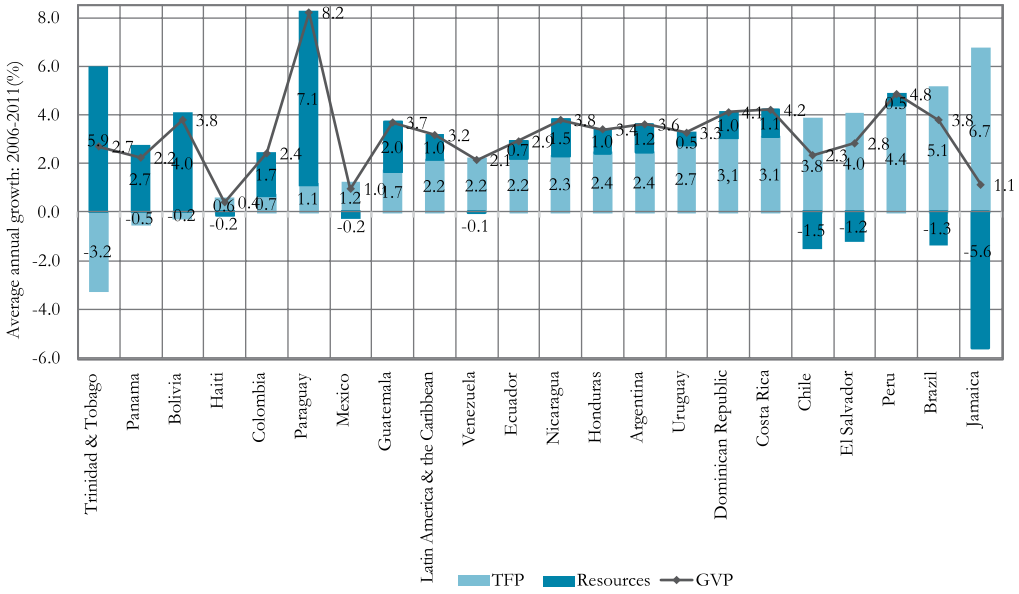
In another group of countries that includes most of the LAC nations, both productivity and the resources used for production increased. In a number of countries (Peru, Costa Rica, Dominican Republic, Uruguay, Argentina, Honduras, Nicaragua and Ecuador), productivity rose more than the increase in resources. For example, in Peru agricultural productivity rose by an average of 4.4% per year during the period 2006-2011, while resources allocated to the sector increased by 0.5%. In the other countries (Guatemala, Paraguay and Colombia), productivity growth rates were much lower. A case in point was Paraguay, where annual production rose by 8.2%, basically due to a 7.1% increase in the use of resources, with productivity up only 1.1%.

8 The growth rates of resources are negative in Figure 6.

9 Taking into account the identity: growth of production = growth of resources + growth of total factor productivity (TFP).

Finally, in Trinidad and Tobago, Panama, and Bolivia agricultural productivity fell during the same period, which means that those countries had to use more production resources to maintain positive rates of growth in production. In the case of Trinidad and Tobago, an average increase of 5.9% per year in the rate of resource utilization made it possible to achieve sustained annual growth of 2.7% in agricultural production, and to offset the loss of 3.2% per year in productivity (Figure 6). The biggest expansion in the use of resources appears to have occurred in the farm animal subsector and in the use of machinery, while the figures for farmland and labor fell (Fuglie, n.d.).

Figure 6. Indicators of agricultural sector performance
(% average annual growth: 2006-2011)



Source: IICA with data from IFPRI (2015).
Note: GVP: Gross Value of Production (base years 2004-2006); TFP: Total Factor Productivity; Resources: land, labor, livestock, machinery, fertilizers. Excludes countries for which data is not available.

Box 1. Productivity and efficiency

According to the broadest definition, a country's agricultural productivity is the portion of aggregate agricultural production not explained by the amount of inputs used in the production process. This is known as total factor productivity (TFP). Productivity increases when the rate of growth of aggregate agricultural production is higher than the rate of growth of the total factors used in the production process, which includes changes in the use of resources such as land, water, labor, capital, raw materials, and energy (Rada and Valdes, 2012).

As TFP is difficult to calculate, agricultural value added (measured in constant terms) per agricultural worker is often used as an indicator of productivity (World Bank n.d.). Other partial measures used as indicators of productivity are the productivity of land (yields per hectare) and labor, defined as the ratio between aggregate production and total labor employed in the sector.

The literature (Rada and Valdes, 2012) identifies two main sources of productivity growth (measured in terms of TFP). One source is technological change or progress, which essentially means technological breakthroughs or the expansion of the production frontier, usually measured as the growth in TFP of the country's most efficient producers. The second source of productivity growth has to do with changes in technical efficiency, as a measure of the level of dissemination and adoption of technologies, and of how less efficient producers move toward the frontier or their maximum production potential. This concept is particularly useful for estimating gaps in productivity, thought of as the difference between the TFP of the most efficient producers, and the average TFP of all agricultural producers.

The gap in agricultural labor productivity between LAC and the US is widening

The labor productivity of LAC's agricultural sector (AVA/per agricultural worker[10]) is growing at an annual rate of 3.13%, below the 3.81% of the United States (the reference country) (see Figure 7). The fall in the growth of labor productivity in LAC has meant that over the years the gap with the United States has widened, to 14.32 in 2012.[11] In other words, in that year an agricultural worker in the United States generated 14.32 times more value than an agricultural worker in LAC (USD 63,269 of AVA/agricultural worker in the US compared with an average of USD 4498 in LAC). Figure 7 shows that over the long term the rates of growth of agricultural labor productivity in the United States have slowed, but have always been higher than in LAC (6.6% versus 3.2% during the decade 1997-2006[12] and 3.8% versus 3.1% during the decade 2003-2012).

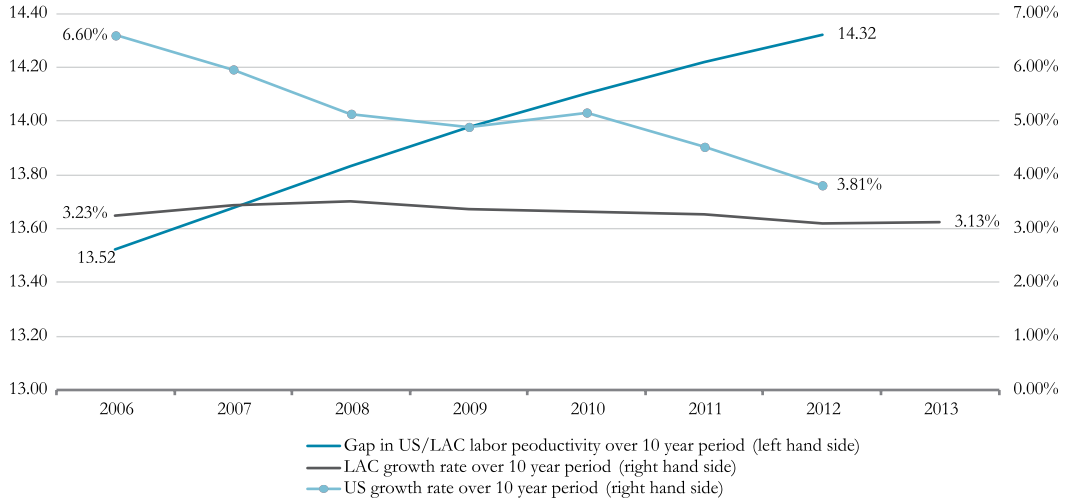
The difference in labor productivity between the United States and LAC is a reflection of the fact that, in the US, the sector's economically active labor force has shrunk, the use of machinery and inputs has intensified, and substantial, sustained improvements in TFP have been achieved, due to technological change and greater technical efficiency. It should also be noted that differences in productivity between countries depend on the predominant production systems. For example, the productivity of systems that make extensive use of land (e.g., corn, soybeans, wheat and livestock) and intensive use of labor (fruits and vegetables and coffee, among others) cannot be similar, as the ecosystems and natural resource bases of countries differ. However, even though differences in productivity levels are understandable, differences in the relative growth of agricultural productivity between LAC countries indicate different levels of progress with the adoption of technologies and innovations in the sector (see definitions in Box 2).

10 Often used as a proxy for agricultural productivity and competitiveness (World Bank), although it is only a partial measure of productivity because other factors of production are excluded.

11 Most recent data available for the US.

12 The base years used to calculate the growth rate vary: the growth datum for 2006 corresponds to the growth rate for the period 1997-2006, while the datum for 2007 corresponds to the rate for the period 1998-2008, and so on.

Figure 7. Agricultural labor productivity of LAC compared with the US



Source: CAESPA, based on World Bank data (WDI, 2015).
Notes: Labor productivity is defined as agricultural value added per agricultural worker in constant 2005 US dollars. The gap is calculated as the difference between the labor productivity of the US and LAC. The rate of growth for 2013 is the average annual rate of growth for the period 2002-2013 (3.13% in the case of LAC).

LAC agriculture's capacity to attenuate the effects of economic crises has decreased

Historically, the agricultural sector has attenuated the effects of economic crises, achieving growth and compensating for falls or sluggish growth in other areas of the economy. However, during the most recent crisis (2007-2011[13]), the agricultural sector followed the same cyclical pattern as the rest of the economy (see Figure 8) and grew by 1.5%, while the average annual growth of the LAC economy as a whole was 2.7%, reversing the trend observed in the past.

It is worth remembering that agriculture grew by 1.9% during the 1981-1985 crisis, while the annual growth of the economy as a whole was only 0.8%. Similarly, during the 2000-2004 recession, the wider economy recorded growth of 1.9%, while agriculture grew at an annual rate of 3.1%.

Agriculture behaved differently during the last crisis because, following trade liberalization, it was more integrated with the rest of the economy. As a result, the sector now responds rapidly to changes in macroeconomic variables and in the international environment. The similar cyclical trend in agricultural AVA and GDP has to do with the performance of several markets (agricultural, mineral and energy products) that move simultaneously, responding to common factors that cause oscillations, such as exchange rates, capital flows, low interest rates, demand in emerging markets, and the global scenario of greater risk and uncertainty (Byrne, Fazio and Fiess 2011; OECD and FAO, 2014).

13 Five-year period, taking two years before and two years after the year with the biggest fall in GDP (2009).

Box 2. Average annual rate of growth of agricultural labor productivity in LAC countries over the last decade (2004-2013)

Average growth for LAC: 3.13%.

With growth of 6.7 %, Brazil is head and shoulders above the rest (the figure is more than double the percentage for LAC as a whole).

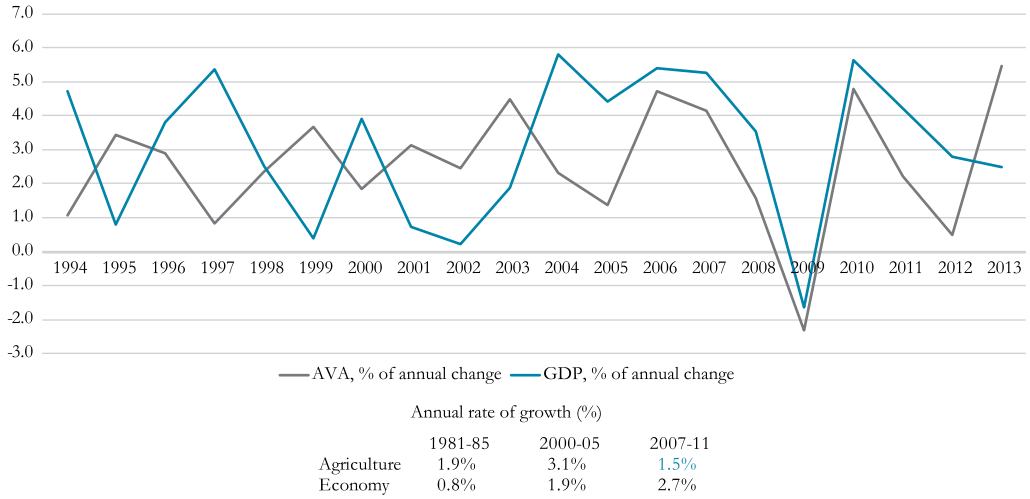
A number of other countries exceeded the average for LAC: Dominican Republic (5.5 %) Surinam (4.8 %), Nicaragua (4.3 %), Trinidad & Tobago (4.2 %), Bolivarian Republic of Venezuela (4.2 %), El Salvador (4.1 %), Jamaica (4.1 %), Honduras (3.9 %), Paraguay (3.6 %), Uruguay (3.5 %), Ecuador (3.4 %). Barbados (3.3 %) and Costa Rica (3.2 %).

Other countries recorded lower rates of growth in productivity, below the LAC average: Chile (2.8 %), Grenada (2.7 %), Mexico (2.2 %), Colombia (1.9 %), Guyana (1.8 %), Dominica (1.3 %), Guatemala (1.1 %) and St. Vincent and the Grenadines (0.9 %).

Finally, Bolivia (-0.01 %), Antigua & Barbuda (-0.6 %), Panama (-0.8 %), Belize (-3.2 %), St. Lucia (-3.3 %) and St. Kitts & Nevis (-4.6 %) experienced negative growth in labor productivity.

It is evident that in recent years the link between the agricultural and energy sectors has become stronger, mainly due to the impact of variations in oil prices. Higher oil prices basically affect agricultural prices in two ways. On the one hand, production costs rise, especially in the case of agricultural systems that make the most intensive use of energy and entail the transportation of food and raw materials; and, on the other, the production of crops for markets is displaced by the production of crops for biofuels.

Figura 8. LAC. Gross Domestic Product (GDP) and Agricultural Value Added (AVA) 1994-2013, annual percentage of change in value in constant 2005 dollars



Annual rate of growth (%)

	1981-85	2000-05	2007-11
Agriculture	1.9%	3.1%	1.5%
Economy	0.8%	1.9%	2.7%

Source: CAESPA (IICA) with data from the World Bank (WDI, 2015).

Exchange rates and domestic demand also behaved differently during the most recent crisis. In the period 1981-1985, local currencies depreciated against a representative basket of currencies, which helped increase exports that generated foreign exchange that was subsequently used to pay the debt. Domestic markets, on the other hand, contracted significantly, so that tradable sectors geared to exports grew more than non-tradable ones. The negative shock on income had less of an impact on the demand for basic products, including food, which accounted for the better relative performance of the agricultural sector. A similar situation occurred during the period 2001-2005.

The period 2007-2011 was quite different. Local currencies appreciated, coupled with increases in internal and external demand and higher commodity prices. Agricultural exports benefited from the rise in prices—despite the appreciation in exchange rates—and the growing international demand for food and raw materials. On the other hand, the agricultural sector of non-tradable products (geared to the domestic market) was boosted by strong domestic demand. Thus, the boom in exports of agricultural and non-agricultural products went hand in hand with the production of non-tradable goods.

In the last three years, the scenario has changed. Local currencies have depreciated, oil and commodity prices have fallen, and domestic and foreign demand has weakened. In this context, in 2013 the first signs of divergence in growth rates (Figure 8) began to appear, with the agricultural sector growing more than twice as fast as the economy as a whole (5.5% compared with 2.5%). Equally positive levels of growth are anticipated for the sector in 2014, due to the surge in commodity production (especially corn and soybeans) in several countries. This contrasts with the loss of buoyancy of the LAC economy, which is predicted to grow by less than one percent this year (see the chapter on the Macroeconomic Context). In such a scenario, agriculture may once again attenuate the effects of the crisis, which would mainly benefit the LAC population in rural areas.

The devaluation of the currencies of LAC countries will boost agricultural exports

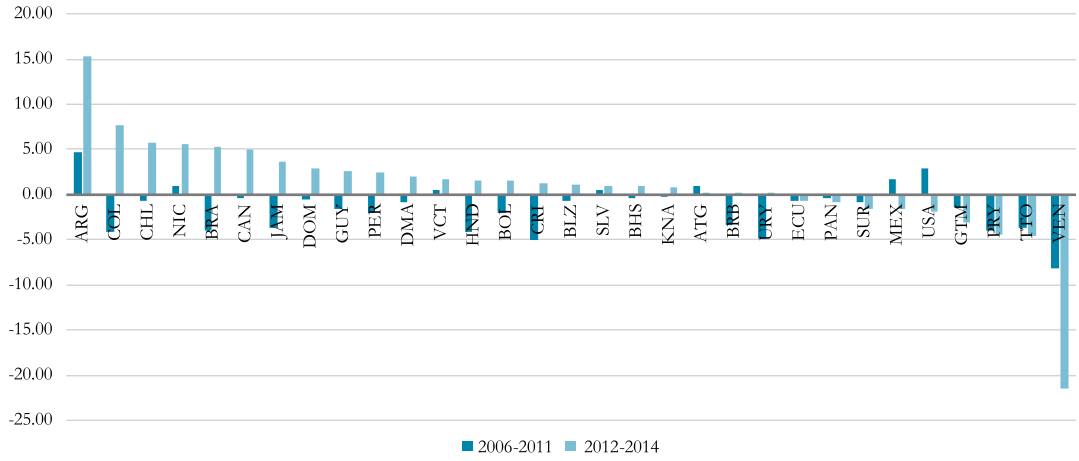
Changes in the exchange rate of a country's currency against those of its main trading partners are one of the factors that can most affect the competitiveness of its agricultural exports. While a depreciation can make its exports more competitive in international markets by making them cheaper in foreign currencies, an appreciation has the opposite effect. Hence, the importance of an analysis of the issue.

During the economic crisis and the spike in international commodity prices, most LAC currencies appreciated against a weakening US dollar. During the period 2006-2011, the US dollar lost an average of 2.8% of its value (in real effective terms[14]) against the currencies of its main agricultural trading partners (Figure 9), thus making the exchange rate one of the determining factors in the boom in US agricultural exports during the same period. As was to be expected, most LAC currencies (except those of countries such as Mexico, Antigua and Barbuda, El Salvador, St. Vincent and the Grenadines, Nicaragua and Argentina) appreciated against the US dollar. Although such appreciations are a disincentive to exports, the high prices of the exports concerned attenuated their negative impact.

The last three years have seen a change in the trend. The US dollar appreciated by an average of 2% (2012-2014), causing the

14 Taking into account the exchange and inflation rates of the country's principal trading partners.

Figure 9. Real effective exchange rate for the agricultural sector



Source: IICA (CAESPA), with data from ECLAC (n.d.), ERS (n.d.), United Nations Statistics Division (n.d.) and World Bank (n.d.).

Note: Argentina's CPI is taken from CEPALSTAT, where 2014 is an average through October; Venezuela's exchange rate is the official rate for food purchases (6.3 Bs.F/USD 1). The bilateral exchange rates were weighted using the share of the exports of the main trading partners for the period 2009-2010.

currencies of most LAC countries to depreciate (in real effective terms), even though their trade structures vary. Argentina was the most extreme case, with a real depreciation of the peso against the currencies of the Eurozone (the destination of 19.5% of the country's agricultural exports), China (12.6%), Brazil (8.4%), and Chile (3.9%), its principal trading partners. The Colombian peso depreciated against the US dollar (the destination of 41% of Colombia's exports), the euro (20%) and the bolivar fuerte (10%). Chile followed the same trend, with its peso depreciating mainly against the US dollar (the United States accounts for 25% of its exports), the euro (16%), the yen (12%) and the yuan (5%).

El Salvador, a dollarized economy, is experiencing a real depreciation of the dollar, unlike the United States, even though the US is one of the main recipients of its exports (22%). Due to low inflation, the dollar in circulation in El Salvador is depreciating against the euro, the quetzal and the lempira, while the US dollar is appreciating against the Canadian dollar and the yen.

Unlike the cases mentioned, in LAC only the currencies of Venezuela, Trinidad and Tobago, Paraguay, Guatemala, Mexico,[15] Suriname, Panama, and Ecuador have continued to appreciate. Venezuela maintains a fixed exchange rate for food and basic needs (BsF 6.3/USD 1) but, with domestic inflation running at over 60% per year, its currency appreciates in real terms against the currencies of the Eurozone, the United States, Colombia and China, its main trading partners.[16] The appreciation of the currency in Ecuador (similar to Panama) is due to the dollarization of the economy, but also because the currencies of the principal trading partners—the EU, Russia and Colombia (in addition to the US)—are devaluing rapidly, or because relative inflation

15 In the case of Mexico, preliminary data for 2015 show a significant appreciation of the currency.

16 The situation in Venezuela is somewhat more complicated due to the existence of three exchange rates, in addition to the black market rate: the official dollar (6.30 bolivars), the SICAD dollar (12 bolivars) and the Simadi dollar, which closed at 198.40 bolivars on June 3, 2015.

is much lower than Ecuador's (with the exception of Russia, where inflation is rising significantly). Furthermore, the real effective depreciation of Mexico's peso was to be expected, since the US is the main destination for its agricultural exports (77%); however, inflation in Mexico is almost the double the rate in the US, which accounts for the appreciation of the peso in real terms, even with regard to the EU, Canada and Japan. The situation is very similar in the case of Guatemala, where El Salvador is an additional factor: it is the third largest destination for Guatemala's exports but its rate of inflation is four times less.

LAC agrifood exports are more buoyant, distributed more widely, and targeted at those markets where demand is strongest (mainly China)

In the period 2011-2013, the average annual increase in world agrifood exports was only 2.4%, with those of LAC posting a historically low rate (an average of 1.9% per year). The main reason for the declining growth of exports in LAC was the slowdown in the agrifood exports of three subregions—the Caribbean (an annual average of 0.64%), the Andean (1.6%) and, especially, the Southern (1.5%)—, which has a greater weight in the regional aggregate. The agrifood exports of Central America and Mexico, on the other hand, grew by more than 3.2% and 4.4%, respectively. In 2013, LAC agrifood exports showed signs of recovery, having recorded 3.9% growth the year before. However, the growth is still only moderate when compared with the global rate of 5.6%.

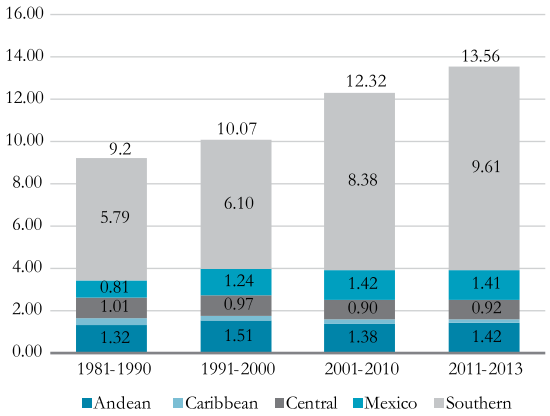
It is worth noting the situation in other parts of the Americas. US agrifood exports were also affected by the deceleration across the globe, growing by only 2.2% (below the world average but more than the average for LAC), while Canada's exports grew by an average annual rate of 4.4%.

The rates of growth of agricultural exports in the last three years contrast sharply with the greater buoyancy shown during the 2001-2010 decade, when LAC agrifood exports grew by an average annual rate of 12.8%, above the global figure (10.7%). The rates for the different parts of LAC varied significantly, with the Southern sub-region experiencing exceptional average annual growth of 14.3%, followed by the Andean sub-region (11.1%), the Central sub-region (10.1%), Mexico (9.1%), and the Caribbean (5.7%).

As can be observed in Figure 10, the greater buoyancy of LAC exports during the first decade of the 21st century (and, to a lesser degree, over the last three years) has caused its share of the total world agrifood exports to increase from 9.25% in the 1980s to almost 14% in the last three years (2011-2013). The Southern Cone is the sub-region that has earned the biggest share of world trade, reflecting its dominant role as a supplier of agrifood products, mainly of oilseeds and oil meal, cereal grains (except rice), meat, and sugar.

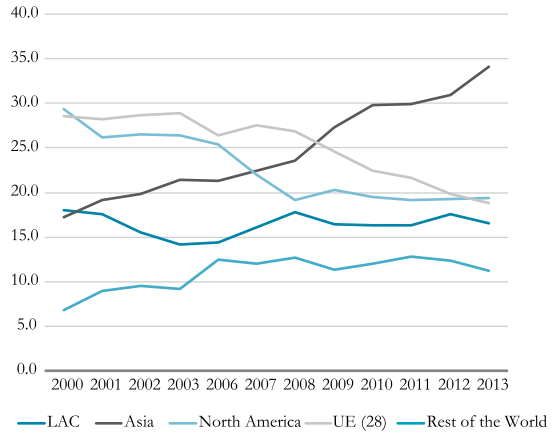
LAC's greater buoyancy is due primarily to the growing demand from Asia, which in 2013 accounted for 34.2% of LAC agrifood exports, almost double the figure of 17.2% recorded in 2000. Furthermore, despite the acknowledged great potential for intraregional trade in LAC, intraregional exports as a share of the total has stagnated for years at around 16% (see Figure 11). Bolivia, Uruguay, Nicaragua, El Salvador and a few other countries are the exception, recording significantly higher levels of trade with their neighbors.

Figure 10. LAC agrifood exports as a percentage of the world total (1981-2013, in percentages, by LAC subregions)



Source: IICA (CAESPA) with data from the WTO.

Figure 11. LAC: breakdown of LAC by destination (% of values in dollars 200-2013)



Source: IICA (CAESPA) with data from COMTRADE.
Note: LAC includes 20 countries with trade data for the entire period: ARG, BHA, BRB, BLZ, BOL, BRA, CHL, COL, CRI, ECU, SLV, GTM, GUY, JAM, MEX, NIC, PAN, PRY, PER, URY.

Outlook

The slowdown in world demand for agrifood products has implications for the outlook for the growth of LAC production and exports

Global imports of agrifood products have slowed significantly in the last three years, posting annual rates of growth of 2.5%, a much lower figure than the long-term rate of between 10% and 11% (see Table 1). With regard to long-term growth (10-year period), LAC is the region with the biggest fall in food imports (more than 8%), followed by Asia (7.7%, excluding China). Imports from China, the EU, and the US are also down, but not as much (5.6%, 5.5% and 2.4%, respectively). However, in terms of the real effect (contribution), the EU, in first place, and Asia (24), in second place, were responsible for most of the fall in world demand, because, together, these two regions accounted for more than 60% of world agrifood imports (Table 1). The countries of the Southern Region, which were affected by a recessionary trend, were largely responsible for the fall in the demand for agrifood imports in LAC. No aggregate data for agrifood trade is available for 2014 but the preliminary data suggests that total South American imports fell by 4.2% during that year (WTO, 2015).

China recorded by far the strongest growth in demand, contributing to a sustained increase in its share of global imports of agrifood products (6.6% in 2013). China's economy grew by more than 20% per year over the last decade, 13.5% during the last three years, and 9.4% in 2013, continually posting a rate twice the world average. However, the deceleration in Asia has had, and will continue to have, a significant impact on LAC agrifood exports, basically those of the Southern Cone countries (Figure 11 shows the large increase in LAC exports to Asia in recent years).

On the other hand, the rate of growth of Russia's agrifood exports has fallen sharply (down from over 16% per year in the last decade to just 4.8% in the last three years and 6.4% in 2013). According to preliminary data, in 2014 Russia's agrifood imports fell as a result of the sanctions imposed by the US and the EU. In LAC, countries such as Ecuador could take advantage of this situation.[17] Ecuador is already Russia's main supplier of bananas, and of large quantities of other products such as pineapples, mangoes and papaya. For its part, Argentina is among the biggest exporters of prunes, blueberries, cherries, pears, lemons, tangerines and grapefruit, among others. Finally, Chile is a major exporter of grapes, cherries, raisin, kiwifruit, and dried fruits to Russia.

US agrifood imports grew by only 3.1% in 2013, below the average for the previous three years (4.3%) and the previous decade (more than 7%; see Table 2). However, an upturn in the US economy would increase the demand for imports. Mexico and the Central American and Caribbean countries would benefit especially from such a development, as they are more heavily dependent on US demand for imports. Around 80% of Mexico's exports go to its northern neighbor, while the figures for Bahamas, Jamaica, Barbados, and the Central American region are 70%, 50%, 40%, and 40%, respectively.

Finally, other countries could be affected by a weakening of the EU economies. The bloc accounts for a large percentage of the agrifood exports of Belize, Panama, Peru and Guyana (50%, 40%, 32% and 35%, respectively).

The World Trade Organization (WTO) forecasts a modest recovery of trade in 2015 and 2016 (WTO, 2015), thanks basically to the incipient recovery in the EU and moderate growth in the United States and the emerging economies. The growth of LAC agrifood exports will depend on possible variations in the weak growth of the economies that drive the market and geopolitical tensions among trade partners (for example, the crisis in Ukraine and related tensions). However, even when trade does expand, growth is unlikely to be strong enough to overtake that of the economy as a whole, as was the case in previous decades. The fall in prices may be the result of a combination of supply overhang, high inventories, and weak demand, conditions that could change and affect world trade in 2015.

Are we witnessing the end of the super cycle in nominal and real prices, and of the volatility of international food prices?

By March 2015, international food prices had fallen 26.6% from their December 2010 high in real terms but were still 32.5% above the average during the 2002-2004 base period, and just 2.6% above the average of the long-term trend (15 years) (Figure 12).

It is anticipated that the positive trend in long-term agricultural prices observed over the past 15 years will be reversed and become negative in the next decade. This conclusion is supported by the technical analysis of prices, which shows that real food prices fell below their average trend for the last 5 years (short-term moving average) and have nearly reached their average for the last 15 years (long-term moving average). This negative trend in agricultural prices is also supported by the forecasting models of the OECD and FAO (2014), and the recent statistics on the boom in cereal grain and oilseed production (see the "Agriculture" chapter) and the high levels of commodity stocks across the globe.[18]

17 The sanctions imposed by the US and the EU do not apply to Ecuador and the other LAC countries, so could result in stronger demand for LAC products.

18 For the 2015-2016 biennium, the WASDE report (USDA, 2015) projects that wheat stocks will rise by 2.4 million MT over 2014-2015 (reaching 203.3 million MT). Soybean and oil crop stocks are also set to increase by 8.3 million MT according to the figures for the same periods (a total de 107.4 million MT). Furthermore, the second-highest cotton stocks ever recorded are expected (up to 106.3 million bales). Corn stocks, on the other hand, will fall slightly (by 0.6 million MT), while rice stocks will decline by 6.9 million MT, with the stocks-to-use ratio falling to 18.7%, the lowest figure since 2006-2007.

Table 2. Agrifood imports worldwide, broken down by region (growth, contribution and market share in percentages)

Importing region	Ten-year moving average				Three-year	One year
	2001-2010	2002-2011	2003-2012	2004-2013	2011-2013	2013
LAC (21)[a]						
Rate of growth	10.9	12.0	12.0	11.3	2.8	1.7
Share	4.6	4.7	4.7	4.8	5.0	5.0
Contribution	0.5	0.6	0.6	0.5	0.1	0.1
Asia (24)[b]						
Rate of growth	9.2	10.4	10.8	10.5	2.8	3.0
Share	17.7	17.8	17.9	18.1	19.1	19.0
Contribution	1.6	1.9	1.9	1.9	0.5	0.6
China						
Rate of growth	20.7	20.7	19.6	19.0	13.5	9.4
Share	3.5	3.9	4.3	4.8	6.1	6.6
Contribution	0.7	0.8	0.9	0.9	0.8	0.6
U.S:						
Rate of growth	7.2	7.3	7.1	6.7	4.3	3.1
Share	9.6	9.3	9.2	9.0	8.6	8.6
Contribution	0.7	0.7	0.6	0.6	0.4	0.3
Russia						
Rate of growth	16.6	16.0	14.6	12.8	4.8	6.4
Share	2.4	2.5	2.6	2.6	2.8	2.8
Contribution	0.4	0.4	0.4	0.3	0.1	0.2
UE (28)[c]						
Rate of growth	10.3	9.5	7.8	6.7	1.3	6.8
Share	44.3	43.6	42.8	42.0	38.6	38.5
Contribution	4.6	4.1	3.4	2.8	0.5	2.6
Rest of the world						
Rate of growth	12.3	13.0	12.3	11.3	0.4	3.7
Share	17.8	18.2	18.5	18.7	19.8	19.4
Contribution	2.2	2.4	2.3	2.1	0.1	0.7
World	10.7	10.8	10.0	9.2	2.5	5.0

Source: IICA (CAESPA), with data from ITC 2015, April 2015.

[a] LAC (21) includes 21 countries with trade data for the whole period: Argentina, Bahamas, Barbados,Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Dominican Republic and Uruguay .

[b] Asia (24) includes 24 countries with trade data for the whole period: Saudi Arabia, Armenia, Azerbaijan, Cambodia, Republic of Korea, the Philippines, Georgia, Hong Kong, India, Indonesia, Israel, Japan, Kazakhstan, Kyrgyzstan, Lebanon, Malaysia, Maldives, Oman, Qatar, Singapore, Sri Lanka, Thailand, Turkey and Vietnam.

[c] EU (28) includes Austria, Belgium , Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden and United Kingdom.

The negative trend in agricultural prices should not be a surprise, since over the very long term (since 1900) the real prices of agricultural products have fallen at an average annual rate of one percent, despite the world's population growing from less than two billion inhabitants to nearly seven billion in 2010 (Fuglie and Wang, 2012).

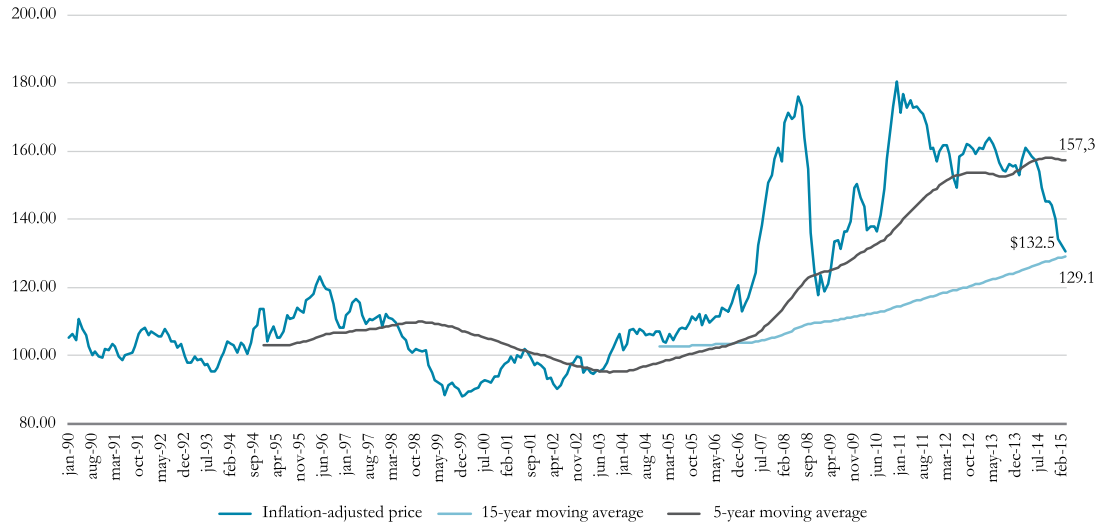
As well as experiencing a negative trend, the annual and monthly volatility of international prices has stabilized at levels similar to those observed before the crisis (Figure 13). Prices went from annual variations of over 30% during the crisis to 6.4% in 2013-2015. Monthly volatility also declined, from 5.2% in May 2009 to 1.5% in March 2015.

However, precautionary measures should be adopted, because the underlying factors responsible for the very high volatility observed in the crisis years have not disappeared. One example is sufficient to illustrate this point. Between August 2014 and March 2015, the annual volatility of the food price index rose from 3.2% to 6.4% (see the upturn in volatility in Figure 13).

The trend toward the devaluation of currencies against the US dollar is expected to continue in 2015

According to the forecasts for exchange rates (ERS n.d.) and inflation (IMF, 2015), currencies are expected to continue to devalue in 2015. This scenario undoubtedly calls for the design of policies different from those employed during the most recent crisis. LAC countries will benefit from relatively stronger foreign currencies that make agricultural products more competitive abroad, but imports (food, inputs and raw materials) will be more expensive, which could drive up inflation rates in the region. The improvement in the price competitiveness of LAC exports could cause some countries to impose tariff and non-tariff border measures, in a scenario where the tariffs applied are well below the nominal tariffs permitted under the WTO Agreement on Agriculture. However, although international agricultural prices have fallen in nominal and real terms, they remain high and, therefore, imposing such measures would be counterproductive and of

Figure 12. International food prices
(Jan 1990 – March 2015; in inflation-adjusted dollars, 2002-2004 index=100)



Source: IICA (CAESPA) with data from FAO 2015.

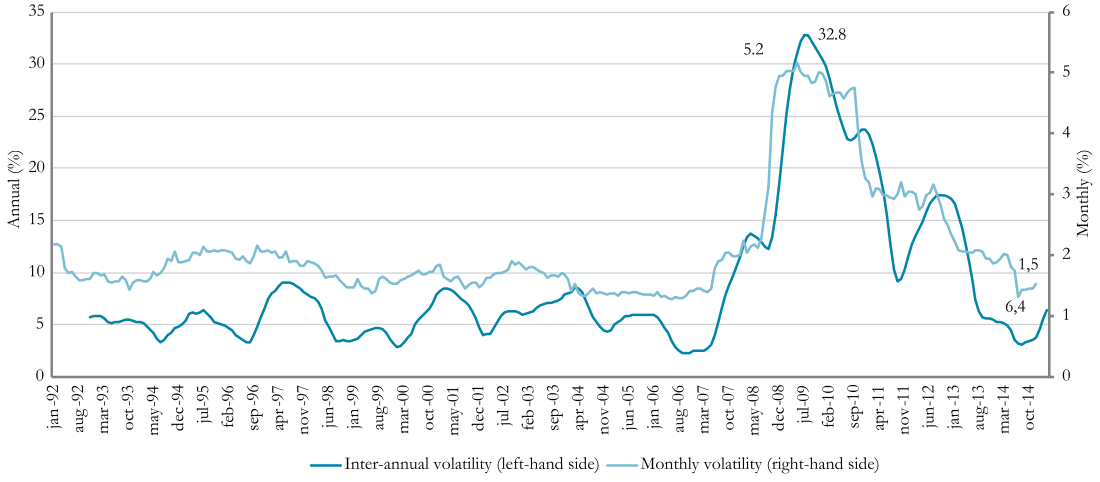
little benefit to consumers. In addition, many countries have little leeway for imposing tariffs or other border measures, due to the commitments they have assumed in the free trade agreements signed with their respective partners, both neighboring countries and partners outside the region. On the other hand, in the face of weakening international demand the devaluation of currencies against the dollar could stimulate demand and exports.

In LAC, the impact of the potential signing of new mega free trade agreements, particularly the Trans-Pacific Strategic Economic Partnership Agreement (TPP) and the Transatlantic Trade and Investment Partnership (TTIP), will vary from country to country

Although the LAC countries have been very active in signing trade agreements outside the region,[19] only three of them (Mexico, Chile and Peru) are involved in the negotiations for the Trans-Pacific Strategic Economic Partnership Agreement (TPP). The twelve countries negotiating this agreement (which include Australia, Brunei, Canada, Japan, Malaysia, New Zealand, Singapore, the United States and Viet Nam), account for 40% of global GDP. This demonstrates the importance of the agreement, both for the countries seeking to form part of it and those that will not. In addition to the TPP, the Transatlantic Trade and Investment Partnership (TTIP), a trade agreement currently being negotiated by the US and the EU, would encompass 60% of global GDP, 33% of world trade in goods, and 42% of world trade in services.

Both mega agreements would have a significant impact on LAC agriculture, basically because they would divert trade and erode preferences in markets that import large quantities of products, assuming that LAC's competitors achieve better access conditions. Furthermore, the harmonization of nontariff measures

Figura 13. Inter-annual and monthly volatility of the international food price index (%, Jan 1990 – March 2015)



Source: IICA (CAESPA) with data from FAO.
Note: volatility, defined as the standard deviation in inter-annual and monthly changes in prices (calculation for 24-month moving average).

19 The LAC countries are members of 73 of the 259 free trade treaties that have been notified to the WTO, with 44 of them involving LAC nations and others outside the region (Josling et al., 2015).

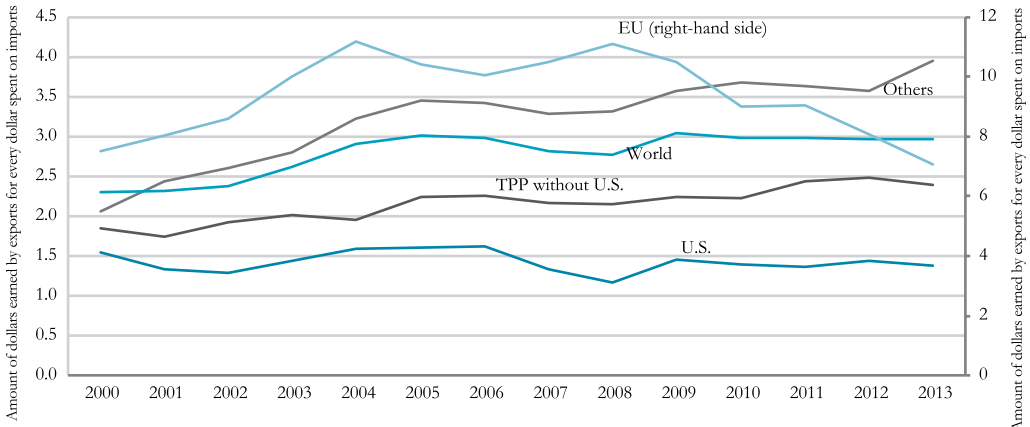
or standards could have major implications. Countries not party to the agreements would lose access as trade is diverted away from them. Their exports would become more expensive than those of the countries involved in the agreements, thanks to the mutual recognition of regulations by the signatory countries. However, countries excluded from the agreements could also benefit from the harmonization or greater consistency of import standards between countries and blocs, especially between the US and the EU (Josling *et al.*, 2015).

One way to predict the possible impact of changes in the market access conditions and competition of the regions and countries involved in the agreements under negotiation, mainly the US, the EU, and Japan, is by analyzing LAC's agricultural trade flows with each of those partners.

The LAC region is a net exporter of agrifood products, with a balance of trade with the rest of the world of three dollars worth of exports for each dollars worth of imports. However, the structure of trade began to change in 2008. The balance of trade with the EU worsened considerably (from a ratio of 11 dollars of exports to 1 dollar of imports in 2008 to a ratio of 7 to 1 in 2013), while it increased with countries involved in the negotiations for the TPP (including the US) and certain others. In fact, LAC's exports to the EU as a share of all its exports fell by nearly 10 percentage points in the period 2000-2013 (from 29% to 19%), while the figure for exports to other markets rose by 19% (from 53% to 65%, without including intra-LAC trade).

Despite the fall in LAC's trade balance with the EU, the region continues to be a very important source of agrifood products for the EU, basically meat (from Argentina, Brazil and Uruguay) and soybeans (from Brazil and Paraguay). However, since the Uruguay Round these countries have enjoyed lower tariffs for beef, while soybeans are free from tariffs in the EU. Countries such as Mexico, Chile, and others in the Caribbean, which enjoy preferential access under the free trade treaties

Figure 14. Agrifood trade balance with TPP and TTIP countries
(Amount of dollars earned by exports for every dollar spent on imports)



TPP: Trans-Pacific Strategic Economic Partnership Agreement
TTIP: Transatlantic Trade and Investment Partnership

Source: IICA (CAESPA) with data from United Nations (COMTRADE).
Note: LAC includes 20 countries with complete data for the entire period of analysis. The TTIP involves the US and the EU. The TPP includes Australia, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore, the United States and Viet Nam.

signed with the EU, could see those benefits eroded if the TTIP is signed, as other countries would enjoy improved access.

With regard to the TPP, LAC's exports vary according to the potential partners. For example, Japan imports meat, citrus fruits, and dairy products from Mexico and Chile, although its main suppliers are Australia and the United States. Other countries that export agrifood products to Japan (in smaller quantities) are Argentina (corn), and Guatemala, Uruguay, and Bolivia (dairy products and sugar). If the TPP improves the conditions of access to the Japanese market for those products, countries not party to the agreement could be affected, due to the possible diverting of trade, which would benefit the member countries (Josling *et al.*, 2015), in this case, Chile and Mexico.

The increase in LAC exports to other countries that are not party to the TPP or the TTIP (see Figure 14) is due to the extraordinary growth of agrifood exports to China from Brazil, Uruguay, Chile, and Peru. Argentina continues to be one of China's major suppliers, but has seen its share drop in recent years (from 14% in 2008 to 11% in 2013). It should be noted that China's share in Uruguay's agrifood exports rose from nearly 2% in 2008 to 18% in 2013, worth USD 1.1 billion. In terms of value, Brazil enjoyed the biggest growth in exports to China: the figure went from USD 6.6 billion in 2008 to USD 20.2 billion in 2013, with China accounting for twice the share of Brazil's total exports (24% instead of 12%). Chile also boosted its exports to China (they rose from USD 460 million to USD 1.1 billion, slightly more than Peru's).

With demand in China and the EU slowing, the countries best placed to take advantage of an increase in the demand for imports among the members of the TPP would, of course, be the signatories to the agreements, such as the US (in 2013, 43.8% of its exports went to TPP countries), Canada (13.8%), Chile (19.5%), Mexico (7.6%), Colombia (13.5%) and Peru (10.8%). At the other end of the spectrum are countries such as Brazil and Argentina, which, in addition to not being involved in the TPP negotiations, are the EU and China's main trading partners in the region. This situation is made worse by the fact that they are the Latin American countries with the fewest free trade agreements (Josling *et al.*, 2015). Paraguay and Uruguay, members of the Southern Common Market (MERCOSUR) are in a similar situation. These countries, which do not currently have trade agreements with the US, the EU or potential members of the TPP, could be affected indirectly by the changes in the pattern of trade that could be brought about by the agreements. However, it is also possible that the United States, as a side effect of the TTIP, could divert some of its current exports to other countries in order to take advantage of the new market opportunities in the EU, creating a situation in which MERCOSUR member countries could boost their own exports.

The fact that China is not included in the TPP has major implications. Some studies suggest that China could obtain important benefits were it to sign the agreement, and suffer negative effects if it fails to do so (Josling *et al.*, 2015). If China were to decide to take part in the agreement, the incentives for the LAC countries to join it would increase considerably, as would the cost of not doing so. Brazil and Argentina are not eligible for the TPP, but could opt to sign bilateral agreements with China, as New Zealand and Australia did.

The countries that have signed trade agreements with one another (Central America, Dominican Republic, Chile, Colombia and Peru) and also signed trade agreements with the members of the North American Free Trade Agreement (NAFTA) and the EU, could see the benefits they enjoy eroded if the TPP or TTIP is signed. Furthermore, countries such as Ecuador and the five MERCOSUR countries (including Bolivia) have watched from the sidelines as a wave of trade agreements have been signed. This will have an impact on the future pattern of trade with the members of the TPP and the TTIP, regardless of whether China becomes a

member (Josling *et al.*, 2015). Studies of the impact of trade liberalization under the TPP and the TTIP show how it could have negative effects on Argentina's GDP in the long term (2%), as a consequence of tariff reductions. The results suggest that these countries need to reduce their tariffs and nontariff barriers under existing agreements. This applies particularly to Mexico, since the simulation models predict that an ambitious scenario of trade liberalization under the TPP and the TTIP could lead to falls in Mexico's GDP of up to 7.2% in the long run.

Finally, these mega agreements are not expected to have much of an impact on LAC agrifood imports, since the profile of the countries that supply the region remains relatively stable and depends much more on intra-LAC trade. For example, many countries in the region obtain more than 50% of their agrifood imports from neighboring countries (especially from MERCOSUR member countries and Central American countries that are members of NAFTA).

Foreign direct investment (FDI) is playing a bigger role in the increase in the production of not only the main agricultural commodities but also tropical products for export

The developing countries are increasingly becoming both recipients and sources of foreign direct investment (FDI) (WTO, 2014). The statistics show that in 2012 they absorbed more than 50% of all FDI across the globe, while 12 years ago (2000) the figure was only 20%. Developing countries have also become a bigger source of such investment, accounting for 7% at the end of the 1980s and 35% in 2012. However, the flow of FDI toward the agricultural sector remains very limited. Despite the key role that FDI plays in agricultural development, it is reported that less than one percent of all FDI (USD 87 billion out of a total of USD 1.2 trillion) was invested in the food, beverages and tobacco sector, while the primary agricultural sector captured only USD 5 billion (2008 data) (Bioversity *et al.*, 2012).

FDI will be essential for the growth of crop production in those Latin American countries that, in addition to having new farmland available, can raise production by increasing yields. Latin America is better placed than Africa, as it has land available closer to markets and population centers, most of it located in areas with rural infrastructure and public goods that facilitate agricultural production and marketing. The region may be better placed but the cost of purchasing or leasing land in Latin America has risen significantly, which may discourage foreign investment in the region's agriculture (Deininger and Byerlee, 2011).

In recent years, FDI in crop production in the Americas has entailed the purchasing or leasing of land for the production of cereal grains and oilseeds and tropical crops for export. According to data for the period 2000-2012, foreign investors acquired more than 2.1 million hectares in LAC for agricultural purposes, or one third of all land purchased in the region during that period (ECLAC, 2012).

The Southern and Andean regions, which are being consolidated as production and trade centers for agricultural and food products, are attracting, and will continue to attract, new flows and sources of investment (private capital, risk capital, etc.), targeted especially at countries with better macroeconomic bases and good prospects for growth and trade opening (for example, the Pacific Alliance). There are reports of major investment in Colombia, Peru, Chile, Paraguay, Uruguay, and Argentina, involving products such as fruits, cacao, quinoa, chia, stevia, oilseed products, beef, and the sectors of new technologies, services, and investment in land (Valoral Advisors, 2015).

Box 3. China's FDI in LAC agriculture

China is perhaps the world's most active investor in agriculture. No longer simply a purchaser of raw materials, its role is now much more pivotal, as a producer and investor in strategic areas and issues. China's trade minister recently announced that more than 300 of the country's firms have invested in agricultural, forestry and fisheries' projects in 46 countries (Gooch and Gale, 2015). However, investment in Latin American agriculture appears to be limited, especially compared to investment in other sectors, and is targeted much less at land purchases than media reports would have us believe (Myers, 2014). In fact, Chinese firms are stepping up their investment in several phases of the production process (e.g., processing plants) in order to increase productive capacity, reduce costs, and diversify risks. According to China's public foreign investment policy, the country aims to promote agricultural investment in the planting of natural rubber; the planting of oilseeds, cotton, and vegetables; the harvesting, transportation, and cultivation of timber; animal husbandry; and ocean fisheries (Myers, 2014). During his most recent visit to LAC, Prime Minister Li Keqiang announced that over the next decade China expects to increase investment in the region to USD 250 billion and trade to USD 500 billion (Bárcena, 2015).

Even though Chinese investment will grow and become increasingly important, it is unlikely to play a leading role in agricultural markets. For example, Chinese imports of edible oils and oilseeds are grown on 50 million hectares of land, but it is estimated that China manages only 350,000 hectares of that land, or less than one percent of the total (Gooch and Gale, 2015).

In LAC, the mobilization of international capital toward regional agriculture will increase, dominated by multinational companies, including traditionally non-agricultural firms. This will further strengthen the processes of transnationalization, vertical integration, and increased participation in global value chains. In general, the following developments are expected:

- An increase in the flows of FDI from multinational companies into the production of crops for domestic markets.

- Increased participation in FDI by state-owned enterprises or foreign mixed consortia, especially involving Asian and Middle East countries, seeking land suitable for producing crops to guarantee sufficient supplies for their domestic markets (ECLAC, 2012), as has happened in recent years in Argentina and Brazil, with the arrival of state enterprises and consortia from Saudi Arabia, China, Qatar, and South Korea. ia Saudí, China, Catar y Corea del Sur.

- An increase in FDI from countries in the same region, taking advantage of similar agro-ecological conditions in neighboring countries and expanding crop production for national companies. This growing trend began at the start of the 2000s, since when the Latin American countries have accounted for nearly 30% of FDI in agriculture in the region (Perrone, 2009).

- More FDI in the production of crops for export, which is reflected mainly in the purchase of agricultural land for that purpose. While in South America foreigners have purchased land to produce cereal grains, soybeans, sugarcane, and livestock, in Central America the land they have acquired is being used for tropical crops such as sugarcane, palm oil, citrus fruits and bananas.

Policy recommendations

Increasing agricultural productivity is undoubtedly the best way to achieve the growth, stability, and sustainability of LAC's agricultural sector, especially in a scenario in which growth in LAC's agricultural productivity has slowed due to the widening gap in agricultural productivity within and between countries, the deceleration of the world demand for agrifood products (which will affect the growth prospects of LAC exports), and the possible the end of the super cycle in agricultural prices.

To increase agricultural productivity, countries in the region should promote investment in research and development (R&D), a factor that has proven to be the most important for achieving that goal. Also needed are efforts to develop financial incentives for producers, promote rural education, improve extension services, invest in rural infrastructure, and improve market access.

Rural credit is another element that should be strengthened, as it plays a key role in improving the distribution of the benefits derived from R&D, especially to ensure that the technology reaches family farmers and helps to close the productivity gaps between producers.

An important action for reducing differences in productivity and helping to achieve more equitable income distribution within countries is the strengthening and improvement of rural and agricultural education, as well as the development or enhancement of producers' skills.

Another action that can help to promote equity and increase productivity is the improvement of land distribution. This also makes productivity more uniform across producers, leading to more efficient use of labor, partly due to the fact that the cost of supervision is lower (Eastwood *et al.*, 2010).

Coupled with the above, more equitable access to assets and the means of production would have positive effects on productivity and productive efficiency, and that, in turn, as part of a virtuous circle, would help to bridge gaps in productivity and income between countries, regions, rural areas, and producers.

The State should ensure the provision of public goods that benefit everyone, such as general improvements in infrastructure and mechanisms for the protection of property rights. Public goods of this kind are neutral policy interventions that benefit every sector of the economy by lowering the cost of doing business in a country, improving market access, attracting more investment, and, in general, helping to improve national productivity and competitiveness.

Investment in rural infrastructure—roads, refrigeration and storage networks, slaughterhouses, markets and information and communications networks, and even the construction of infrastructure for technology research and innovation (laboratories, experimental stations, etc.) and the framework for rural financing—is vital to promote faster adoption of agricultural technologies and practices.

Countries also must have efficient transportation networks (roads, ports, railways, air transport, etc.) and the logistics required for the fast and cheapest possible flow of goods and services to and from markets, and the timely and convenient movement of workers. A telecommunication network facilitates the free and fast flow of information for decision making based on timely and reliable information.

With regard to market conditions, the State must ensure that there is more competition and trade opening, and that farmers and others involved in the sector respond to market signals, so that research, resource allocation, the adoption of new technologies, and

innovations match those signals and changes in relative prices. Several studies show that improving access and integration into markets increases producers' technical efficiency (Latruffe, 2010). With permanent changes in access to, and the availability and prices of, inputs, having an inventory of technologies that make it possible to use fewer inputs in relation to changes in market conditions becomes strategically important.

In light of the potential growth of inflows of capital and FDI, countries should adopt measures to ensure that such investment has the biggest possible impact on productivity, competitiveness, and the sustained growth of agriculture. The State can attract and promote FDI not only as a source of capital, but also as a mechanism that promotes technology transfer and the improvement of individual and institutional capabilities in the host country, via competition, the demonstration effect, and practical learning, that lead to improved productivity. Competition, more productive linkages, labor mobility, and the demonstration effect (Laborda Castillo *et al.*, 2011) can have an impact on technological change, the accumulation of knowledge, and capacity building, factors that are all essential for productivity.

Inflows of capital should be complemented with local investment in R&D activities, which is essential so that knowledge is transferred and triggers productive innovations. In order for FDI to have a bigger impact on development and productivity, human capital should also be increased.

Although FDI is vital for the development of agricultural sectors and natural resources, if investment is highly capital intensive it may not produce the desired social benefits (job creation, for example), and displace other investments that are useful for the country. Furthermore, the negative impact on the environment must also be borne in mind (WTO, 2014). One challenge is to coordinate extractive activities with the rest of the productive structure, creating, for example, synergies and positive linkages between mining and agriculture in rural territories, not only to raise productivity but also to help diversify rural income. The race to attract investment should not be based on minimum levels of internal regulation that pose a threat to the interests of the country as a whole.

Finally, countries should promote trade as an instrument for economic growth and development, eliminating protectionist measures, improving market access, and avoiding policies that distort competition, so that decisions are taken based on market signals. In the face of weakening international demand, the countries should continue to promote the intraregional integration agenda, which will make it to possible to increase the flow of agricultural trade among the LAC countries.

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Chapter 2.2: Agriculture (crops)

Agriculture (crops)

While cereal and oilseed production and trade in the Americas reached record levels in the last two years, many of the region's important tropical crops lost ground in the market due to competition from Asian and African producers. Broadly speaking, there was more climate stability in the Americas, but some regions were affected by the conditions prior to the onset of El Niño (high temperatures and long periods of drought). Coupled with the appearance of pest and diseases, those conditions posed a threat to crop yields. Producers of tropical crops were hit hardest by these phenomena but the situation also provided an opportunity to incorporate innovations that have enabled farmers to increase their production and positioning in niche markets with higher value added.

Facts

- The economic slowdown in China, the European Union (EU) and Russia is impacting the region's agriculture, due to weaker demand for its crops.
- The sustained decline in the prices of oil and its byproducts is likely to have an impact on crop production and trade in the Americas, which will depress prices in coming months.
- Farmers' planting decisions have been based more on demand and signals in international markets.
- Asia and Africa have increased their agricultural production, especially of tropical crops, and their share of international markets.
- The yields of the Americas' main agricultural crops will largely depend on climate variability and possible outbreaks of pest and diseases.

Trends

Cereal and oilseed production and trade in the Americas reached record levels in 2012 and 2013

Boom in cereal production in the Americas: The production and trade bonanza was particularly important in the case of cereals, thanks to an increase in the area harvested and higher yields. In 2013, cereal production in the Americas was up 19.38% over 2012, posting more than double the global rate of growth (8.36%). The boom in production that year was led by the performance of maize in North America and Argentina. Maize accounts for nearly 70% of the physical production of cereals in the Americas.

In 2014, climate stability was greater than in previous years, making it possible to equal the cereal production record set in 2013 (OECD and FAO, 2014). Following two poor years, wheat accounted for the main production increases in the Americas (with Brazil and

Box 4. Response to the variation in crop prices

In recent years, crop producers in the Americas have responded rapidly to changes in the relative prices of their products. Although the Northern and Southern regions provided the biggest response (mainly with regard to cereals and oilseeds), the Andean, Caribbean and Central American countries also stepped up cereal production in order to do more to reduce their dependency on food imports. In the case of oilseeds, the increase in production since 2010 (2.5% per year) has been due almost exclusively to the expansion of the acreage under cultivation; while in the case of cereals (annual growth of 5.3%), it was due to similar rises in both acreage and yields). Soybeans are the crop that has expanded the most in Latin America and the Caribbean (LAC), with the annual rate of growth in planted area rising in recent years, from an average of nearly 4% during the period 1990-2000 to 5.4% from 2000 onwards.

Argentina leading the way), thanks to strong demand across the region, high prices, and good climate conditions at key moments in the production cycle. This increase was far greater than the dips in coarse grain[20] production that occurred in specific subregions (FAO, 2015d), mainly maize in Central America (see below for a more detailed analysis) and Canada.

At the time of writing, the final data on the 2015 harvest is still not in, but the forecast was that the wheat harvest would be up slightly, due to higher yields in the United States (US) and Canada. Furthermore, the reduction in maize acreage in Argentina and Brazil following the fall in the relative price of the crop (compared with the price of soybeans), is set to lead to a significant reduction in coarse grain production in South America (FAO, 2015d).

With respect to trade, cereal imports (especially those of coarse grain and wheat) were down across the globe in 2014. This was due to a combination of factors: the world's main consumers of cereals boosted their domestic production, stocks were higher than in previous periods, and, most importantly, there was a slowdown in world food demand. The result was a slight reduction in world trade in cereals (-5%). In the Americas, cereal imports remained relatively stable, except in some Central American countries where drought significantly affected yields and imports had to be stepped up as a matter of urgency (this development will be discussed below).

Record oilseed production: Oilseed production in the Americas reached unprecedented levels in 2013 and 2014. With the Southern Region and the US (FAO, 2015d) leading the way, soybean production grew at record rates, mainly due to the increase in the planted area in response to the higher prices being paid compared to maize. The trend of expanding soybean production is expected to continue in the Southern Region in 2015, thanks to favorable climate conditions that will boost yields (FAO, 2015d).

Some Asian and African countries are seeing a rapid increase in the production of tropical crops in which the Latin American countries have traditionally excelled, putting pressure on LAC to be more competitive in international markets

The competitiveness and international market share of some of LAC's main producers and exporters of tropical fruits (bananas and pineapple), tubers (cassava), and beverages (coffee and cacao) are under threat from the

20 Coarse grains include corn, sorghum, barley, oats, and rye.

rapid growth in the production and exports of their Asian and African competitors. The ability to increase yields rapidly, incorporate new land and hire cheaper labor has allowed countries like Viet Nam, Philippines, Ghana, China and Ivory Coast to achieve a rate of growth for production of the crops in question double that of LAC. In fact, between 2010 and 2013, the annual growth rate of the production of fruits, vegetables, and roots and tubers in LAC was much lower than the world average (it has even fallen for roots and tubers), mainly due to a reduction in the acreage planted with those crops.

Although the rapid increase in the production and exports of African and Asian countries undoubtedly poses a challenge for the competitiveness of all LAC tropical products, the threat is bigger for products with little differentiation in international markets, such as pineapple, bananas, and cassava, and smaller for products like coffee or cacao, in which the region is well positioned in differentiated markets (quality, aroma and altitude, among other factors).

Pineapple: The LAC country that enjoys the biggest share of the world pineapple market is Costa Rica, which accounted for 46% of all global exports of the fruit in 2013. During the period 2008-2013, Costa Rica managed to increase its share of both world production and exports. And while Costa Rica increased its exports by 10% per year during that five-year period, the performance of the Philippines was even more impressive. Not only did the country's exports grow by more than 20% per year, doubling the nation's share of world trade in the fruit (it went from 4% to 8%), but they did so by means of a 75% improvement in yields during the period.[21] The intensification of pineapple production has raised environmental concerns both in Costa Rica and the Philippines, mainly due to the impact that pineapple growing can have on natural resources (water pollution, soil erosion, appearance of pests, sedimentation of rivers, etc.) and the social conditions of communities and their workers (displacement of farmers, change in land use, etc.) (Boeglin, 2015).

Bananas: Most of LAC's leading banana producers and exporters (with the exception of Costa Rica and Colombia) experienced strong growth between 2008 and 2013. Ecuador consolidated its position as the world's leading exporter (it now accounts for 23% of the total), while Guatemala, Honduras, and the Dominican Republic all increased their market share. However, as in the case of pineapple, the annual rate of growth of most Latin American countries was only one fourth of the rates achieved by Asian and African countries like the Philippines and Cameroon. The latter's exports of the fruit rose by more than 20% during the five-year period in question,[22] enabling them to increase their market share considerably and penetrate markets previously dominated by LAC.

Coffee: Brazil remains the world's biggest coffee producer and exporter and certain other Latin American countries continue to position themselves in very valuable niche markets, but Asian countries such as Viet Nam, India, China and Laos (and even African nations like Tanzania) have rapidly increased their coffee production and their share of world markets. This has meant smaller shares for Brazil, Colombia, Guatemala, Peru, Costa Rica, El Salvador and other LAC countries. While the strategy of Viet Nam (whose coffee production rose by 9% per year between 2008 and 2013) has been based mainly on achieving higher yields (a strategy similar to that of India), the more than 20% annual growth in China's production has been due almost exclusively to the incorporation of new land. Laos and Ivory Coast enjoyed annual increases in yields

21 However, through 2013 pineapple yields in Costa Rica (60 t/ha) remained almost 50% higher than in the Philippines.

22 In both cases, the increase in acreage was the key factor in the growth achieved.

of over 15% during the same five-year period, compared to the maximum increases of 3% achieved in LAC. In 2013, coffee yield per hectare in Viet Nam and China was 70% more than in Brazil and up to three times more than in Colombia, Guatemala, Peru and Costa Rica.

Cassava: Latin America's main producers and exporters of roots and tubers have been losing ground to their leading competitors for some time, and in 2013 and 2014 the trend continued. Costa Rica, Latin America's biggest exporter of cassava, saw its share of world exports drop from 9% to 4% during the period 2008-2013, while the share of Thailand and Viet Nam combined rose by 15%, with the countries accounting for 77% of world exports in 2013 and 92% in 2014. In the case of production, although Costa Rica has managed to increase cassava acreage and yields faster than Thailand and Viet Nam, the technological gaps are still very wide. The cassava production yields of the two Asian countries are, respectively, 72% and 41% higher than those of the Central American nation.

Cacao: The African countries already account for most of the world's exports and are in a position to set international prices, and their cacao production and exports are also increasing rapidly. In 2013, Ghana, Ivory Coast, and Nigeria accounted for 70% of global cacao exports. While LAC has a big slice of niche markets based on value added and quality, and the cacao exports of Ecuador, the region's biggest exporter, have grown steadily in recent years (11% per year during the period 2008-2013), the production of Ghana and other African countries is growing three times more quickly than that of LAC's cacao producers. In fact, over the last five years Ghana tripled its market share, up from 17% of world exports in 2008 to 45% in 2013, and replacing Ivory Coast as the world's leading exporter. Over the next 15 years, the competitiveness of these African countries may be undermined by an increase in mean temperature caused by climate change, which could reduce the areas suitable for growing cacao considerably (CIAT, 2011).

Box 5. The competitiveness of LAC, Asia, and Africa in tropical crops

A simple way to identify LAC's level of competitiveness in tropical products is by comparing its comparative export advantage (CEA) with the evolution of the same indicator in the Asian or African countries.

As can be observed in Annex 2, (to be found at the end of this chapter), over the last five years the African and Asian countries have performed better in the international markets of cacao, coffee, bananas, pineapple, and cassava than the Latin American and Caribbean countries. As the figure shows, at least one African or Asian country achieved bigger growth in CEA compared to LAC's principal exporters (during the period 2008-2013). Although it must be said that the countries of the region continue to be more competitive in producing coffee, bananas, and pineapples, the gap with regard to Asian and African competitors is narrowing all the time (the CEA of the Asian or African countries is greater in the cacao and cassava markets).

Although climate stability in general favored crop production in the Americas, in some regions the conditions caused large agricultural losses

Even though some regions, especially Central America, faced climatological problems, the Americas in general experienced climate conditions that were favorable for the yields of the principal crops during the period of analysis. This was mainly important in the northern and southern regions, which notched up record harvests of cereals and oilseeds thanks to short weather windows at key points in the plant growth cycle.

The sub-region that faced the biggest climate difficulties during the period of analysis was Central America, where the conditions prior to the El Niño phenomenon[23] included a severe drought that affected cereal production especially. Because of the drought, maize production fell by more than 10% from 2013 levels, obliging countries to import 11% more to meet domestic demand. Although smaller harvests pushed up local maize prices, the supplies imported in the months prior to the drought for distribution by the Central American governments helped prevent higher consumer prices (except in El Salvador). Beans were also affected by the higher temperatures during the drought, and large quantities were imported to make up for the expected shortfall in production. Nonetheless, low stocks led to record price increases during 2014 (FAO, 2015d).

As well as Central America, the drought affected other important crop-growing regions of the US (mainly the Midwest and California), Canada, Mexico, Brazil, Colombia, and Jamaica, among others countries, with substantial crop losses. In Chile, low temperatures and flooding seriously affected the production and export of berries, apples, grapes, bilberries, and vegetables. For example, the floods that occurred in the Atacama region at the end of March 2015 affected, totally or partially, more than 13,000 hectares of land used to grow fruits and vegetables, in addition to most of the irrigation, storage, and transportation infrastructure (Fresh Plaza, 2015).

Agriculture built around greater use of technology and innovation

Despite the yawning technological gaps and uneven modernization that remain the norm among and within the countries of the Americas (the subject of agricultural productivity is discussed in the chapter entitled "Context of the Agricultural Sector"), the incorporation of technology and innovation in the continent's agricultural sector has increased, although family farming has undoubtedly made least progress in this regard. The most highly developed agriculture (mainly related to export products) has undergone a technological renewal that includes the use of genetically modified seeds (Box 7), zero tillage, the incorporation of information and communications technologies, automation, protected environments, the use of agricultural waste, the principles of agro-ecology and integrated crop management, controlled release fertilizers, etc. Although the increase in the productivity of LAC crops has been due mainly to the adoption of those innovations in commercial farming, traditional family agriculture, which enjoys less access to productive resources, has also gradually incorporated new technologies into its processes. This has made it possible to improve farm and crop management practices, reduce postharvest losses, lessen or minimize the environmental impact of agricultural processes (clean technologies), and promote the use of biological inputs to complement or replace agrochemicals, among others benefits.

23 Although at the beginning of 2015 the appearance of El Niño Southern Oscillation (ENSO) had not been formally declared, throughout the Americas (and especially in Central America) dry conditions and much higher than average temperatures had been recorded.

Box 6. Coffee leaf rust in Central America

In the 2012-2013 growing season, a sudden, intense outbreak of rust occurred on Central American coffee plantations. The main reasons for the reappearance of the disease were: a) because coffee prices remained persistently low, for years farmers failed to invest in their coffee plantations, even minimum investments in fertilizer, fumigation, renewal of plantations and shade management, which increased the vulnerability of plants to pests and diseases; b) the low presence of the pest in previous years, coupled with the lack of state resources and restructuring processes, meant that scientific research on the subject was reduced substantially; c) the increase in the mean temperature in Central America, coupled with the absence of adequate agronomic practices, created the conditions for a reappearance of the disease; and, d) nearly 80% of coffee plantations in Central America are planted with varieties that are susceptible to rust (Elverdin et al., 2014).

By the end of 2013, rust had affected nearly 55% of the coffee plantations in Central America (IICA, 2013) and caused the loss of 16% of coffee production, or some 3.5 million 60 kg sacks of coffee worth USD 499 million. Central America's family farmers were hit especially hard, as nearly 80% of the region's coffee growers are smallholders (IICA, 2013).

In response to the emergency, the Central American governments, supported by various regional cooperation institutions (IICA among them), acted quickly to arrest the causes and impact of the rust, especially through programs designed to contain the outbreak, promote integrated crop management, foster plant genetic research for the development of varieties with better resistance to rust and good organoleptic quality, renew old, unproductive plantations, and protect vulnerable farms, among others objectives (IICA, 2013).

Thanks to the speed with which many of these actions were implemented, Central American coffee production is set to recover slightly in the 2014-2015 harvest, except in El Salvador, where efforts to control the outbreak have been less successful. However, some countries in the region have not still managed to overcome the rust's impact completely. The drought conditions have hindered the implementation of the measures required, while some producers have not received timely technical assistance, credit and inputs, among others (Avelino, 2015).

A study conducted in 2013 by the Inter-American Institute for Cooperation on Agriculture (IICA), the Inter-American Development Bank (IDB) and the Regional Fund for Agricultural Technology (FONTAGRO) showed that innovative practices have been introduced for family farming in LAC, such as short marketing circuits, new varieties of crops that are more resistant to pests, diseases, and adverse abiotic factors (e.g., drought and salinity), public-private networks to promote competitiveness, and the use of bioinputs for production.

Although innovation continues to be the exception rather than the rule in family farming, the results achieved through the use of the innovative practices mentioned show that innovation can play a key role in narrowing the gaps in present and potential productivity, both between different countries producing the same crop, and between farmers in a single country on the cutting edge and those producing less efficiently.

Production of crops for growing niche markets is on the rise

The middle classes of developing countries now have bigger incomes and they are more concerned about health issues. In recent years, this has led to the rapid growth of markets of "healthy products" and certain fruits and vegetables with high nutritional value or that have become gourmet items. In the Americas, significant increases have been recorded in the production and export of organic products, crops that offer health benefits (herbs, quinoa, chia, etc.) and nontraditional vegetables (pumpkins, artichokes, asparagus, etc.) in response to the demand for such "new" products. Some countries (Peru, Bolivia and Chile, among others) have taken advantage of these commercial opportunities to step up the production and export of such nontraditional products. For example, world exports of quinoa doubled during the period 2012-2013, with Bolivia and Peru accounting for the lion's share (more than 80%) of that increase (ITC, 2015). Chia (harmonized system code 120799) is another case in point in LAC. Bolivia and certain others countries have taken advantage of the spike in world demand and, during the five-year period 2008-2013, increased their exports by 65% per year (ITC, 2015).

As well as taking advantage of increased demand for nontraditional products, the countries that have long been major exporters of coffee and cacao (Costa Rica, Colombia, Ecuador and Peru, among others) continue to look to differentiation as the best strategy for positioning themselves in the niche markets with strongest growth. The different factors on which producers focus include origin, the type of technologies employed, the people involved in the production process, and the environmental impact of the production system, among others. It takes time and international recognition before these strategies bear fruit, and they are more difficult to implement for countries whose entry into

Box 7. The expansion of biotech crops in the Americas

Eighteen years after they were first introduced, GM crops (crops modified using molecular biology techniques) top the list of those that have been adopted in agricultural production. The Americas have played a leading role in the rapid process of adoption, with the region presently accounting for more than 87% of the total area planted with such crops. Just three countries—the US, Brazil, and Argentina—are responsible for over two thirds of the world total. Other countries that plant GM crops are Canada, Paraguay, Uruguay, Bolivia, Mexico, Colombia, Honduras, Chile, and Costa Rica (the last two exclusively to produce seeds). The growth of the production of maize, soybean, cotton, and canola in the Americas has been due partly to the fact that biotech crops are more tolerant to herbicides and more resistant to pests and diseases.

The developing countries have played a key part in the expansion of GM crops, not only because they have increased the acreage planted with them but also because the level of adoption has been high (cotton and soybean are two cases in point), and more than 15 million small and medium-scale producers across the globe have become involved. In 2014, 53% of farmland planted with GM crops for the first time was to be found in developing countries, with LAC leading the way. Brazil, for example, planted the second largest amount of new land with the crops in 2014, and in recent years has had the highest annual rate of growth.

Source: IICA (CAESPA), based on information from ISAAA 2014 and COP-MOP 2014.

coffee and cacao markets is more recent. This gives LAC countries a big advantage over the Asian and African nations whose market share has increased in recent years.

As a result of the application of a differentiation strategy, some of these products have achieved greater recognition in the marketplace, reflected both in the loyalty of customers and their readiness to pay a higher price. In the case of coffee, for example, although the Asian and African countries (with the exception of Kenya) led the growth in exports over the last five years, it was the Central American countries and Colombia that received higher unit prices for their coffee. According to TradeMap data (ITC, 2015), China was the country that achieved the biggest growth in coffee production and exports during the period 2008-2013. However, its strategy was based on volume, with each exported ton of coffee during the period 2012-2013 obtaining a unit price of USD 3140, very close to the world average. The two next most successful countries, Brazil and Viet Nam (the world leaders in the coffee market), achieved the same type of growth in exports (due mainly to higher volumes). Their coffee was sold for an average of USD 3250 and USD 2140 per ton, respectively. Costa Rica and Colombia, on the other hand, opted for positioning and differentiation strategies that permitted them to export each ton of coffee at an average unit price of USD 4260 and USD 4150, respectively, during the period 2012-2013. In fact, according to the National Coffee Association of the United States, the world's biggest market for the crop, 85% of the population of that country recognizes Colombia as a coffee producer, leading the perception of quality based on origin, followed by Costa Rica, which enjoys 59% recognition (Agency EFE, 2015b).

Outlook

LAC will play a key role in the food supply

Various studies have suggested that LAC, along with South Africa, is the region best placed to increase crop production, potentially even doubling current production levels (World Bank, 2011). The abundance of natural resources available, especially water, will permit LAC countries to incorporate new land into crop production. In fact, nearly 36% of all the unused land suitable for crop farming is to be found in LAC.

An additional advantage in the case of LAC is the fact that land is available with infrastructure and fairly close to markets (land located less than six hours away from population centers). As shown in Figure 15A, the South American countries have the best prospects of incorporating new areas into crop production (as a percentage of the current cultivated area), especially Uruguay, Bolivia, Venezuela, Paraguay, Argentina and Brazil. In contrast, a large proportion of the Central American and Caribbean nations are already using most of the land suitable for agriculture.

However, as yield growth rates have dipped over the last decade (mainly for the cereal crops that provide the most important staple foods), the incorporation of new arable land into crop production will not be sufficient. Once again, the developing countries, especially those in Africa and LAC, will have the biggest potential to contribute to increased crop production through higher yields.

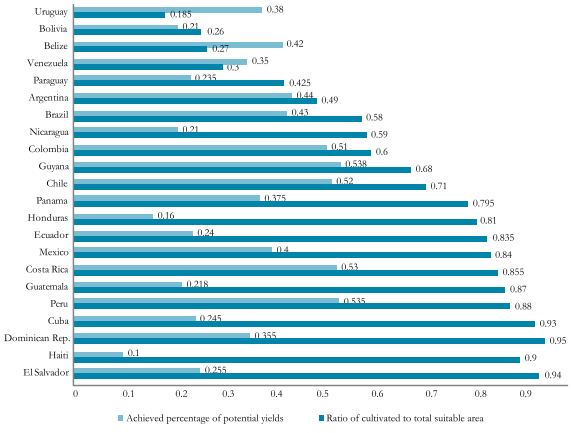
When the countries are categorized according to crop yield gaps and the possibility of incorporating new areas into crop production (Figure 15B), the model predicts that, in percentage terms, countries such as Bolivia, Paraguay, Nicaragua, Honduras, Venezuela, Ecuador, Guatemala, Panama, and Uruguay (upper right quadrant in Figure 15B) are the ones most likely to increase crop production through the incorporation of new land and the adoption of technologies and innovations designed to raise production yields.

For the countries to be more competitive, they will have to comply with more sanitary requirements and private trade standards

For many years, the private sector has been establishing standards and regulations for traded products that are usually stricter than public ones. Producers must meet a series of requirements related to safety, quality, care of the environment, and the observance of social and labor principles. Unlike most public standards, which focus on the final product, private ones also regulate things such as production processes and methods (Sáenz, 2009). In addition to seeking greater credibility in the eyes of consumers, the establishment of such standards allows leading companies to differentiate their products in markets in which quality is an increasingly important factor. While there is no question that private standards have had a positive impact on food safety and quality, they have also acted as major barriers to market access for many LAC farmers, particularly medium and small-scale producers (Sáenz, 2009).

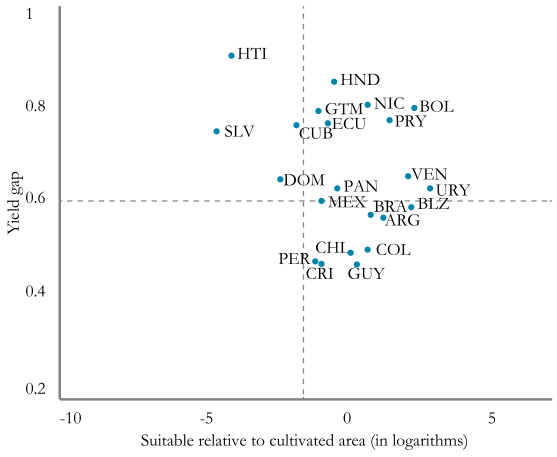
Although private standards have existed for more than two decades (by 2010 more than 400 private systems of standards had been put in place), it is predicted that they will become even stricter in the years ahead. Furthermore, whereas in years past systems of specific standards of market leaders proliferated, such as Carrefour's Filière Qualité, Marks & Spencer's Field to Fork and Tesco's Nature's Choice, the harmonization of collective systems of national and international standards will increase. Two cases in point are GlobalGAP and

Figure 15A. LAC: yield gap and availability of uncultivated land



Source: World Bank, 2011.

Figure 15B. LAC: yield gap and availability of uncultivated land



Source: World Bank, 2011.

the Global Food Safety Initiative, which have procedures designed to gauge the equivalency of national and international systems of standards governing both final products and the processes involved throughout the chain.

Although considered voluntary, compliance with private standards will be increasingly mandatory, given the growing involvement of large retail distributors in agroindustrial value chains, at both the international and national levels. At the world level, more than half of retail food is traded through big supermarkets and hypermarkets, obliging all suppliers who wish to participate in these marketing channels to meet the standards established by the retail chains (both local vendors and exporters).

Moreover, the compulsory nature of compliance with private standards is even greater in LAC, since, at nearly 75%, the share of the five main retailers in the region's domestic markets is even bigger than in developed countries. Also, foreign multinational companies, which have even stricter private standards, have a market share in excess of 60% in countries such as Argentina, Mexico, Costa Rica, Colombia and Guatemala, among others (Reardon and Berdegué, 2002). This shows that compliance with private standards is a requirement not only for agricultural producers focused on exports but also for family farmers who want to place their products in agroindustrial chains geared to national markets.

LAC's domestic markets will grow and short food supply chains will increase

Over the last two decades, the production of crops for exports has grown much more strongly than production targeted at local markets, but the situation could be about to change. The burgeoning population in LAC is benefiting from improvements in education and higher incomes, not only boosting their purchasing power but also their preference for a healthier, more balanced diet, based on more locally produced fresh food, and elements such as proximity, origin, and the processes used. This will undoubtedly open up major opportunities for agricultural producers, especially medium-sized and family farmers, who have greater difficulty meeting the high standards imposed by international markets.

For many reasons, it is predicted that short circuits such as farmers' and ecological markets, purchases of produce from local farmers for school meals, and institutional purchases from family farmers, among others, have high potential for growth in the years ahead. Firstly, geographical proximity and the absence of intermediaries allows for more contact between consumers and producers. This suits consumers who wish to interact with farmers directly and know more about processes throughout the chain and products with a smaller ecological footprint. Secondly, with seasonal crops being produced in neighboring areas, marketing channels of this kind ensure the availability of locally-grown fresh food. Thirdly, as smallholders are mostly involved, governments promote and support the creation of short circuits for the marketing of crops as a means to integrate family farmers into formal markets (for more information about this subject, see ECLAC, FAO and IICA, 2014).

Growing demand for wholesome, healthy food will create opportunities for the region's crops

While one of the biggest drivers of short circuits in LAC will be the growing demand for foods that theoretically offer extra benefits (so called "healthy" products) and have a smaller ecological footprint, most of the crops that fit into these categories (healthy and ecological) will be produced for export. Demand for healthy products will grow most strongly in countries outside LAC. Although they are more demanding, and even require compliance with

certification standards, the US, European, and Asian (mainly Japanese) markets for such products are more developed, enjoy more robust growth and, above all, are ready to pay higher prices for differentiated products (ProChile, 2014). In light of this, many countries in the region, through the promotion of the modernization and innovation of production processes, will be in a position to enter or consolidate their position in those foreign markets, especially as some already have clean production technologies and mechanisms that associative enterprises can use to achieve better participation in chains and recognition in some of the markets mentioned.

The fall in cereal prices and rise in sugar and oilseed prices anticipated in the short term will have a differentiated impact on national markets in the region

In the short term, the trend observed for the last six years is expected to continue and, as a result, price formation in international crop markets will be characterized by the following trends:

Cereals: World cereal production, which will continue to grow steadily and surpass the rate of growth of consumption, will be used mainly to meet the burgeoning demand for coarse grains for animal feed. Due to its increased availability, maize is expected to play a bigger role in trade in cereals across the globe in coming years.

The difference between the production and use of cereals, coupled with the increase in stocks being promoted by some of the world's biggest producers and consumers, such as China (all cereals), Thailand (rice) and India (rice and wheat), will depress international cereal prices in the months and years ahead (USDA, 2015a).

Soybeans: Due to the strong demand for vegetable oils and animal protein in China and other Asian countries, trade in soybeans will surpass trade in grains and cereals. As a result, countries like Argentina, Brazil, Russia, and Ukraine will play an even bigger part in world soybean trade. However, Russia and Ukraine's share of the market will depend on the evolution and outcome of the political conflict between those nations.

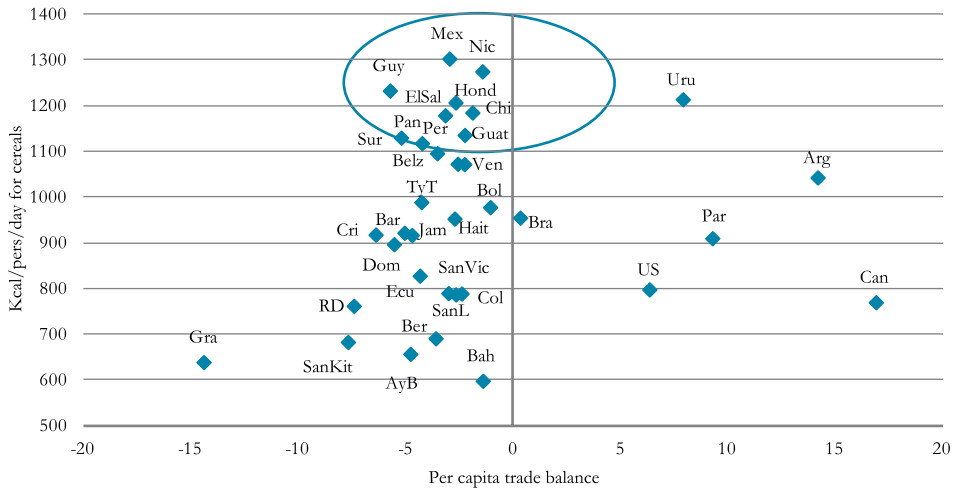
Unlike the trend in the world cereal market, the short-term outlook for the oilseed sector is positive, with sustained increases in demand providing stability in coming months and even occasional small increases in the prices of soybeans and their byproducts, mainly flour (OECD and FAO, 2014).

Cotton and sugar: In the short and medium term, there will be a strong increase in demand for these two products, mainly from developing countries. In the case of cotton, the release of China's stocks will make it possible to meet rising demand, and even produce a slight oversupply, which will depress international prices. The opposite is true in the case of sugar, whose price is expected to rise, with world demand outstripping supply despite continued strong growth in Brazil's exports (OECD and FAO, 2014).

Differentiated impact across the region: The impact of changes in international crop prices will vary across the Americas. While, at the aggregate level, a fall in cereal prices could provide a respite for the balance of trade of net importing countries, at the national level it could negatively affect local producers of the crops in question, as international prices may be transferred to prices in local markets.

In addition to the trade position of each country (net importer or exporter), the impact of variations in international prices will depend on each crop's importance to the respective national diet. For example, if cereal prices fall in international markets, the countries that would benefit the most would be net importers of cereals (in this case, expressed in per capita terms) that contribute the largest amount of kilocalories to national diets. Figure 16 shows that countries like Mexico, Nicaragua,

Figure 16. The Americas: Per capita trade balance (2013) and caloric contribution of cereals (2011)



Source: IICA (CAESPA), based on data from FAOSTAT.

Honduras, Guyana and El Salvador (included in the red circle) would benefit the most from lower cereal prices, as cereals contribute more than 50% of the required daily intake of calories (based on an intake of 2200 kilocalories per day).

In the event of an increase in international soybean prices, as is expected in the short term, and a consequent rise in domestic prices, the consumers most negatively affected would be those of some Caribbean countries (Barbados, Cuba, St. Vincent, Trinidad and Tobago, etc.), and Panama, Venezuela, and Suriname.

Alerts regarding possible outbreaks of pests and diseases, and other plant risks

The spread of pests and diseases in the region is expected to increase in the medium and long term, as a result not only of variations in precipitation and temperature caused by climate change, but also of increased monocropping, incorrect use of agrochemicals, use of uncertified seeds, and failure to comply with the sanitary standards governing international trade. In the short term, the crops most susceptible to outbreaks of pests and diseases will be bananas, coffee, citrus fruits, and soybeans.

Box 8. The effect of El Niño on crops

El Niño will undoubtedly alter the prevailing climatic conditions in LAC during 2015. In the dry regions of the Andean countries, more rainfall could lead to higher yields of certain crops. In contrast, in Mexico, along the pacific coast of Central America and the Andean Caribbean, and in Brazil (except for the south), less precipitation and drought would significantly impact production, mainly of crops such as staple grains, coffee and cacao. Flooding could cause similar losses, but in different crops, in some regions of Argentina and Chile (GRID-Arendal, 2005).

Bananas: Latin America's biggest banana producers are preparing for the possible arrival of the TR4 strain of the *Fusarium* fungus (Panama disease), which has already severely affected plantations of *musaceae* in Australia, Asian countries, and most recently, in Jordan and Mozambique. The threat is greater because Cavendish clone bananas (a variety traded across the globe) are highly susceptible to the pathogen, and the fungus has the capacity to generate structures of resistance that allow it to remain in the soil for long periods. Hence, traditional pathogen control practices are no longer effective and technologies designed to control the fungus are still being tested (FAO, 2014a). If it appears in the region, the effects could be devastating for Ecuador, Colombia, Brazil, Mexico and the Central American countries, where bananas are not only an important crop for the domestic economy (agricultural production and exports), but also a source of food, income, and employment for a large number of rural families. Mindful of this situation, regional agencies such as the United Nations Food and Agriculture Organization (FAO) and the Regional International Organization for Plant Protection and Animal Health (OIRSA) are assisting the countries in devising contingency plans to prevent the fungus from entering their territory and to minimize its impact.

Citrus fruits: The US, Mexico, Argentina, Brazil and Chile are attentive to the advance of different pests and diseases that could seriously affect the production of citrus fruits. In the US, an Asian insect (the Asian psyllid), which carries a bacterial disease that not only damages the fruit but also kills the tree, has been a recurring problem for a number of years, affecting the production of Florida oranges. Methods for detecting the insect exist but no cure for the disease has been developed. This means that, once a farm becomes infected, the only solution is to destroy all the trees. Given the seriousness of the problem, the most recent US Farm Bill includes economic assistance for all citrus producers forced to destroy their trees because of the insect (BBC, 2015).

In addition to the Asian psyllid, citrus fruit production in the Americas could soon face the threat of Huanglongbing (HLB), or yellow dragon disease. CropLife Latin America (2014a) believes this to be the most serious disease in the world for citrus growers, as it induces the loss of juice and increased acidity in fruits. As well as spreading rapidly and being highly destructive, major investment is called for to control HLB, so it is expected to have a big economic impact in coming years. In Mexico, for example, the disease has been detected in most states where citrus fruits are produced. It is estimated that the disease is present on 21% of the country's citrus fruit farms, and that the level of infestation poses a significant threat to the future of at least 6% of them (CropLife Latin America, 2014a). In Brazil, during 2012 the disease infested 64% of all farms and the number of infected plants increased by 83%.
The high economic impact of the disease has convinced countries of the need to make major investments to control it. In the US, the citrus industry itself invests more than USD 20 million per year in control programs (CropLife Latin America, 2014a). Even in Costa Rica, a country where citrus fruits account for a relatively smaller share of agricultural production, State institutions, working with IICA, have carried out prevention campaigns and training activities, and set up laboratories to prevent the spread of the disease.

Coffee: Although in early 2015 the coffee berry borer was detected on coffee plantations in southeast Brazil, it appears that the damage will not be substantial or pose a threat to the country's estimated production, which accounts for nearly 25% of world coffee exports.

At the Latin American level, the biggest health risks for coffee will continue to be in Mexico and Central America, which have witnessed serious outbreaks of leaf rust in the last two

years. In some countries, the disease is latent and its presence is increasing. For example, the Asociación Cafetelera de El Salvador (ACAFESAL) reports that the infestation has increased with the rainy season, spreading to 13 of the country's 14 departments (Quintanilla, 2015). Although less serious, Nicaragua and Mexico are also experiencing problems with rust. Ultimately, this disease could have a significant impact on world coffee markets, as Central America and Mexico produce more than 20% of the world's Arabica coffee.

Cereals and oilseeds: One of the greatest threats to these crops in coming years will be the rapid increase in weeds. As well as possessing a great capacity to germinate and spread, they compete for water, light and nutrients with crops, and adapt naturally to the effect of herbicides. As a result of direct planting, the repeated use of herbicides, failure to rotate crops and monitor lots, and the utilization of inefficient elimination practices, the number of species of herbicide-resistant weeds in the Americas has increased since 1985, reaching nearly 450 in 2015 (Heap, 2014).

It is forecast that, unless there is a significant change in production techniques and inputs, herbicide-resistant weeds will not only lower yields but also lead to considerably higher production costs, with more herbicides and pest control practices required. It is estimated that, in Argentina, Johnson grass *(Sorghum halepense)* is present on 6-7 million hectares of land, affecting soybean, sunflower, and cotton crops and, in particular, maize. Argentine fleabane (*Conyza bonariensis*), which affects soybean and maize crops, is to be found on a further 12-15 million hectares. In Brazil, the Brazilian Agricultural Research Corporation (EMBRAPA) calculates that 90% of the weeds on land planted with soybeans are resistant to glyphosate (CropLife Latin America, 2014c), resulting in losses of up to 20 kg per square meter.

Policy recommendations

Strengthen innovation processes to increase agricultural productivity in an inclusive and sustainable manner: Although some Latin American countries have land available that could be used to produce crops, the reality is that the impact of this alternative would be limited, since it is highly expensive from the economic and environmental standpoint. In most cases, the incorporation of new land for agriculture will not be possible, due to geographical limitations, legal issues related to ownership, and even the high financial cost of putting land used for other purposes into production and reducing the cost of access for producers farthest away from markets. In light of this, food production must be increased by raising crop productivity, mainly through a culture of innovation that takes into account the following and other variables:

- ***The private sector:*** One of the main tasks in the region is to find ways of increasing the involvement of the private sector in national innovation systems. This is of vital importance, as the private sector is the biggest supplier of innovations and technologies for agriculture, since it possesses the capacity to translate science into practical solutions for the local level. A particularly important aspect of such efforts is the need to promote private investment in research and strengthen the channels via which technology research and development centers interact with the private sector. Only through the participation of the private sector in innovation systems will it be possible to modernize and manage agriculture in an efficient and scientific way, converting it into a business.

- ***The participation of family farmers:*** It is essential for agricultural producers to be active participants in the culture of

agricultural innovation, which can be used to recover local practices and knowledge. This is vitally important, considering the importance of the participation of family farmers in the production of the region's crops, especially those that are consumed locally.

- ***Closer links between researchers and producers:*** Closer links and more joint work between the end users and researchers will ensure that research processes will better reflect the sector's real needs, and lead to much greater adoption of the results. In addition to meeting the real needs of the sector, solutions must be economically feasible.

Strengthen the positioning of LAC in international markets, so it can compete with Asia and Africa and cope with the competition: The rapid growth in the production and export of tropical products achieved by the Asian and African countries, which has cut into LAC's share of the market, calls for the development of comprehensive strategies that enable LAC producers not only to increase productivity but also to position their products in markets where consumers have more purchasing power and are more loyal. To achieve that objective, it is recommended, among other things, that the countries:

- Create instruments, or strengthen existing ones, to promote value added in agricultural products, including programs aimed at the development of productive and business competencies and skills, financing, and the facilitation of trade and the development of associative processes.

- Continue to support differentiation processes related to environmental, territorial and cultural factors to position themselves in niche markets (technological innovation).

- Develop products linked to the principal trends observed in national and export markets, such as healthy products, new sources of protein and frozen foods, and ready or easy to cook meals, among others.r o que faciliten su cocción, entre otros.

Strengthen family farmers' links with markets (mainly domestic ones): To enable smallholders to take advantage of the rapid growth of domestic markets in LAC, it is necessary, among other things, to:

- Strengthen public and private programs designed to assist family farmers in complying with the standards and requirements, mainly related to quality and safety, established in government regulations and the standards of the principal distributors in food markets.

- Promote a business culture among family farmers through support for associative enterprises (mainly using favorable legal frameworks and incentives) and the creation of business skills.

- Afford family farmers access to productive assets and knowhow that would enable them to improve their participation in markets. It is especially important that they have more access to differentiated financing, the production and marketing infrastructure, and market information.

Strengthen the risk management systems of crop farmers in the Americas: It is recommended that countries in the region continue to develop and strengthen their integrated crop risk management systems, incorporating their objectives into public policies as a long-term vision. It is essential that risk management programs incorporate instruments designed not only to mitigate and transfer losses incurred as a result of events, but also to adapt systems in such a way as to reduce the impact of such events (technological innovation). Given the outlook for the region, it is particularly

important to work on the management of sanitary and climate-related risks to crops.

Continue to work to prevent the entry and spread of crop pests and diseases in the region: The latent danger of the arrival and spread of pests and diseases calls for continued efforts to strengthen international standards and mechanisms for the regulation of trade and transportation, and further investment aimed at strengthening the infrastructure and capabilities of national plant health systems, including inspection and traceability systems, so that prevention programs receive effective support for the benefit of producers. Given the importance of coffee, bananas and citrus fruits for many countries in the region, it is essential that for the next three years producers of those crops, assisted by the State, step up integrated crop management programs on their farms and plantations, making the necessary investments and implementing the preventive measures required. In the case of coffee in Central America, it is recommended that the countries continue to work on a Central American common policy designed to combat leaf rust and restore the productive capacity of coffee growing, incorporating into the initiative the efforts of national institutes and regional agencies, such as the Regional Cooperative Program for the Technological Development and Modernization of Coffee Production (PROMECAFE), and international organizations (e.g., FAO and IICA), aimed at the management of the disease and research (Elverdin *et al.,* 2014).

Promote the integrated management of natural resources and foster actions to prevent drought from impacting crops: Given the increased intensity of climate change in the region and possible drought conditions brought on by a new cycle of El Niño, the countries need to:

- Adopt integrated natural resource management practices and boost the role of agrobiodiversity in crop production, to reduce the impact of climate variability.
- Work jointly on the implementation of an inter-American agenda to promote the sustainable management of water resources from agriculture, as called for by the Inter-American Board of Agriculture (IABA) at its Seventeenth Regular Meeting, held in Argentina in 2013.
- Improve the management of climatological information, so that agricultural producers can use it to make productive and commercial decisions.
- Design and set up systems for managing climate risks that include not only adaptation instruments that reduce climatological risks and, as a result, losses when disasters occur, but also affordable insurance against climate risks for producers.
- Promote the incorporation of climate change adaptation and mitigation measures into agricultural extension systems, preventing the possible impact of this phenomenon on the crops of each producing region.

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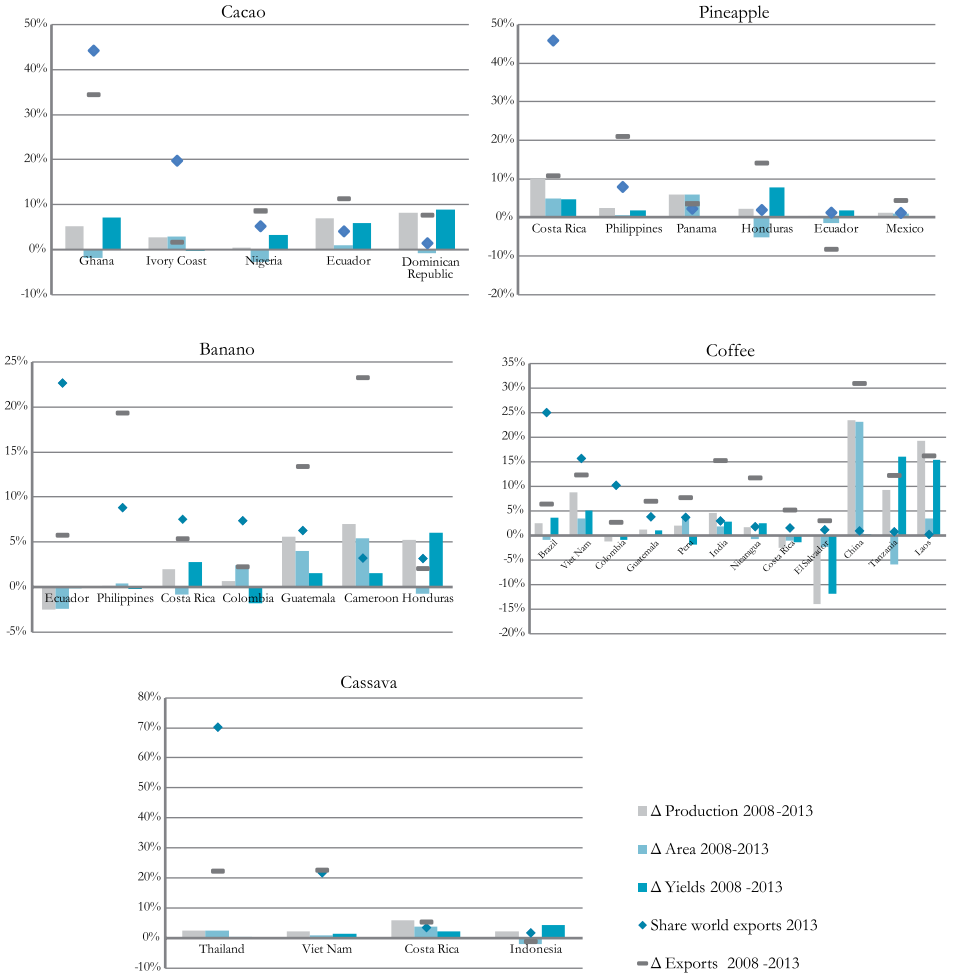
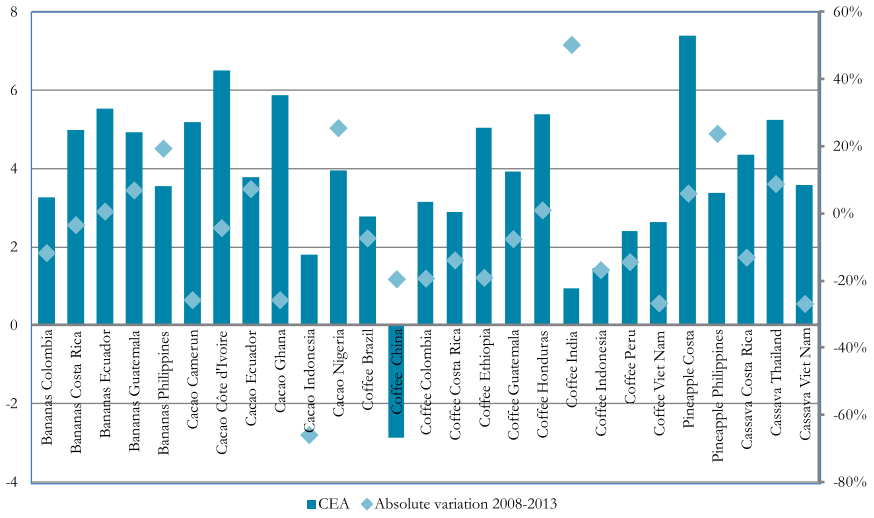
Annexes

Figure A1. Tropical crop production and trade: growth during the period 2008-2013 in some countries of LAC and Africa



Source: IICA (CAESPA), based on data from FAOSTAT and Comtrade.

Figure A2. Value of CEA (2013) and rate of total variation during the period 2008-2013



Source: IICA (CAESPA), based on data from FAOSTAT and Comtrade.

Chapter 2.3: Livestock

Livestock

In Latin America and the Caribbean (LAC), livestock production continues to grow at an impressive rate. Meat and milk production has grown rapidly over the last decade, with poultry production leading the way. Brazil continues to dominate the LAC livestock industry but is being increasingly challenged by other countries in the region. Sustainable intensification is a growing concept and disease eradication efforts are enjoying some success. Investments are needed to improve research and development (R&D), livestock's contribution to food security and sustainable rural development, family farming systems and smallholder access to technology, rural services and markets. Sustainable livestock development and climate change adaptation efforts must also continue.

Facts

- The LAC region now accounts for over 25% of world beef production and over 20% of world poultry production.
- Beef production in the western hemisphere is shifting to South America, and particularly Brazil, as US cattle herds continue to decline and the country struggles to recover from several years of devastating drought.
- Growth in both livestock inventories and production efficiency continue to drive LAC meat and milk production.
- The top three producing countries account for 50%-70% of LAC inventories of all major livestock species, and the top five account for 70%-80%.
- LAC beef exports have more than doubled over the last decade, while exports of pork and poultry by Brazil and Chile have more than quadrupled.
- The recent decline in the prices of oil and feed grains is facilitating a shift of the LAC livestock industry to more intensive forms of production.
- Advanced livestock production technologies and innovations are not being fully utilized because of lack of investments to support extension services, family farming, rural innovation and sustainable rural territorial development in most LAC countries.
- About 85% of the cattle population of South America is now recognized as free of foot-and-mouth disease.

Trends

LAC production gains continue

Meat and milk production has posted rapid gains since 2000 in LAC countries (Table 3). Beef production in the western hemisphere is shifting to South America, and particularly Brazil, as US cattle herds continue to decline and the country struggles to recover from several years of devastating drought. Although still below that of the US, LAC pork production has grown at about double the US and world annual rates since 2000 (47% compared to 24% and 28%, respectively). LAC sheep meat production continues to show little upward trend. The big successes for the LAC livestock industry are poultry and milk production. LAC poultry production has more than doubled since 2000, reaching 24.1 million tonnes in 2013, 22% higher than US production and nearly a quarter of world production (Table 3). At 83.4 million tonnes in 2013, LAC milk production has grown about 35% since 2000, a rate much in excess of that of the US (20%) and the world average (32%). As a consequence, LAC milk production now nearly equals that of the US.

Growth in both livestock inventories and production efficiency continue to drive LAC meat and milk production. A 52% expansion of flocks has been the primary driver in the rapid growth of LAC poultry production since 2000. The same is the case for beef. For pork and milk, however, production growth has been the result of a more balanced increase in both inventories and production efficiency. Brazil and Argentina are the major LAC milk producing countries. Chile and Uruguay are also emerging as major milk producing countries and some Central American countries like Costa Rica have had notable successes in their dairy industries.

In contrast, a prolonged drought in Central America has severely reduced livestock herds and grain crops in El Salvador, Guatemala, Honduras, and to a lesser extent in areas of Nicaragua, Costa Rica, and Panama, putting millions of people at risk, particularly the most vulnerable populations, including families of subsistence farmers, laborers, and landless farmers with low incomes and limited access to land, basic health services, and education.

Table 3. Meat and milk production in LAC, the US, and the World in 2013, percentage change from 2000 to 2013, and shares of world production

	Production 2013			Percent Change (2000-13)			Share of World Production	
	LAC	US	World	LAC	US	World	LAC	EE.UU
	%			%			%	
Beef	17.2	11.2	67.2	23.7	-9.4	13.7	25.5	16.7
Pork	7.2	10.3	115.4	46.9	24.0	28.0	6.2	8.9
Poultry	0.4	0.1	14.1	1.4	-39.28	24.8	2.8	0.7
Sheep meat	24.1	19.7	107.4	94.3	20.8	57.2	22.4	18.3
Milk	83.4	91.3	763.4	34.7	19.6	32.4	10.8	11.9

Source: OECD-FAO (2014).

Livestock inventories are concentrated in relatively few LAC countries. The top three producing countries account for 50%-70% of LAC inventories of all major livestock species, and the top five account for 70%-80%. Dairy cattle and poultry inventories are the least concentrated, with the top three countries accounting for 54% and 60%, respectively. Brazil is the top LAC producer of all major livestock species with 53% of beef cattle inventories, 52% of dairy cattle inventories, 45% of pig inventories, 39% of poultry inventories, and 21% of sheep inventories. Brazil's dominance of the LAC livestock industry is fomented by government financial support for cattle herd rebuilding, genetic improvements, upgrades in pastureland, and sustained cattle prices (Silva, 2012). Argentina is the second largest beef cattle producer (12% of LAC inventories). Mexico is the second largest LAC producer of pigs (18%) and poultry (16%), and the third largest LAC dairy cattle producer (5.5%) behind Colombia (12%), as well as the third largest producer of beef cattle (8%). Argentina is the second largest LAC producer of sheep (18%). Peru, Bolivia, Mexico, and Uruguay (in that order) together account for almost half of all LAC sheep inventories.

Growing LAC livestock product demand and contribution to the LAC diet

Dramatic increases in global demand for food from animal agriculture (meat, fish, eggs, and dairy) are predicted to occur by 2050, due to growing demand for animal protein as world population expands to between nine and ten billion (Goldstein *et al.,* 2015). Much of the growth in animal protein demand is expected to come from developing countries as they urbanize and disposable incomes increase. The United Nations Food and Agriculture Organization (FAO) estimates that by 2050 there will be a 73% increase in meat and egg consumption, and a 58% rise in dairy consumption compared with 2011 levels (McLeod, 2011). While models indicate that North America and Europe will see little growth in per capita consumption of animal protein, per capita consumption in Asia and Africa will more than double, and rise significantly in LAC (Rosegrant *et al.,* 2009).

Per capita consumption of poultry, pork, and dairy products has already grown substantially in most Latin American countries since 2000 (Table 4). Per capita beef consumption, however, has declined across the region, continuing a trend in the shift of LAC diets away from beef to other sources of protein. Uruguay's reported per capita dairy product consumption in 2013 was a staggering 346.0 kg, over 4.5 times that of the US. In Brazil, per capita dairy product consumption in 2013 (76.1 kg) was just under that of the US (76.5 kg) but is expected to pass the US in 2017, according to OECD-FAO projections (OECD and FAO, 2014). Other leading per capita consumers of fresh dairy products in the region include Chile, whose consumption dropped by 8.3% to 70.7 kg between 2000 and 2013, and Mexico, whose consumption jumped by nearly 30% to 44.3 kg over the same period. Together, the other LAC countries consumed an average of nearly 74 kg of milk per person in 2013, an 88% growth from 2000.

Livestock products provide substantially more of the daily caloric intake per person in LAC (641 kcal/capita/day) compared to the aggregate of developing countries (195 kcal/capita/day) and the world (507 kcal/capita/day). While still about 35% below the US, the daily calories provided by livestock products have increased by 13% in LAC countries over the last decade, while declining by 4% in the US. Milk is the largest contributor among animal products to the daily caloric intake of LAC consumers (641 kcal/capita/day) which is about four times the level of developing countries but only about two-thirds that of the US.

Table 4. Per capita consumption of meat and dairy products, 2013 and percentage change 2000-13, selected LAC countries

	Beef		Pork		Chicken		Sheep meat		Dairy[a]	
	kg/hd	% change	kg/hd	% change	kg/hd	% change	kg/hd	% change	kg/hd	% change
Uruguay	41.9	-23.4	12.8	64.7	23.5	54.4	4.5	-50.5	346.0	43.7
Argentina	41.7	-7.7	6.4	4.9	35.4	54.5	1.1	-21.4	45.1	2.6
Brazil	25.3	2.7	11.7	8.6	40.6	56.7	0.4	0.0	76.1	16.3
Chile	15.4	0.1	22.4	79.8	34.1	44.4	0.6	-14.2	70.7	-8.3
Mexico	9.2	-9.4	11.9	36.7	24.9	43.1	0.5	-28.6	44.3	28.2
Other LAC	8.8	12.2	6.0	49.5	19.4	50.9	0.4	-17.3	73.6	88.1
LAC	17.0	0.0	9.6	25.9	30.1	49.5	0.5	-16.6	78.4	26.2
U.S.	25.4	-17.4	20.9	-9.8	44.3	3.6	0.3	-24.0	76.5	-14.2
World	6.5	-3.0	12.6	9.9	13.2	35.8	1.7	3.7	72.1	41.0

[a] Fresh dairy products as defined by OCDE-FAO (2014).
Source: OECD-FAO (2014).

Oil price changes impact LAC livestock sector performance

Before the mid-2000s, oil prices had a limited impact on livestock production. There was little correlation between oil prices and livestock sector prices during that period (Fabiosa, 2009). With the boom in ethanol production and the demand for corn and other ethanol feedstocks in recent years, however, grain prices and, therefore, livestock and meat prices have become much more correlated with changes in oil prices. For example, prior to the ethanol boom, crude oil and corn prices were negatively correlated (correlation coefficient of -0.117) (Fabiosa, 2009). Since then, the corn and oil price correlation has increased dramatically to about 88%. Likewise, the correlation of oil prices with other animal feeds has also increased markedly from 18.2% to 90.9% for soymeal and from -25.2% to 83.4% for distillers dried grains with solubles. As a result, the energy market now impacts the livestock sector strongly through feed costs, which account for a large share of intensive livestock production costs (Fabiosa, 2009).

Between December 1998 and June 2008, crude oil prices (West Texas Intermediate) increased dramatically from USD 16.25/barrel to USD 144.51/barrel (Macrotrends, 2015). Over the next six years (through June 2014), crude oil prices slipped to USD 105.12/barrel, and then dropped by half, to USD 55.56, by April 2015. Since July 2012, the price of corn (US No. 2 Yellow, FOB Gulf of Mexico) also dropped from USD 332.95/tonne to USD 174.23/tonne in March 2015. The price of ethanol has likewise plummeted, from USD 2.50/gal in 2012/13 to USD 1.53/gal. by March 2015. Over the last decade, increasing fuel and feed prices enhanced the incentive for extensive livestock production in LAC, creating upward pressure on the rate of deforestation in the Amazon and other heavily forested areas of the region. The upward pressure on fuel and grain prices during that period also increased the relative cost of protein production from poultry, pork, and dairy products and consequently reduced the accessibility of protein to low income consumers in the region.

Over the last year, however, the decline in oil prices and, therefore, in the prices of

corn and other feed grains, could begin to facilitate efforts to shift the LAC livestock industry to more intensive forms of livestock production if the lower prices persist. Another potential benefit of declining fuel prices could be an increase in consumer purchasing power resulting from lower energy costs. Any increase in real consumer income in the region would make livestock protein more accessible to lower income consumers creating additional demand push to the already upward trajectory of LAC livestock production. The lower cost of oil and fuels could also enhance the real public funds available for investment in infrastructure, production technology, and animal disease mediation programs in oil importing countries. The opposite would be the case, of course, for Venezuela, Brazil, Mexico, and other oil producing and exporting countries in the region.

Evolution of LAC livestock production technology

The ability of the LAC livestock industry to meet growing demand for livestock products in the region is partly a result of the development and adoption of yield-enhancing production technologies, including primarily livestock breeding techniques (Leakey *et al.,* 2009). Latin America's beef industry has evolved to incorporate modern technology (Millen and Arrigoni, 2013). Genomic selection for beef cattle breeding in Latin America has made some progress (Montaldo *et al.,* 2012). Uruguay's sheep production system is an example of how the adoption and intensification of technology results in a more profitable and environmentally friendly sheep production system (Montossi *et al.,* 2013). Private breeding companies are responsible for much of the gain in the rate of genetic change, although the rate achieved in national beef cattle and sheep populations is substantially lower than what is theoretically possible (Thorton, 2010). In many Latin American countries, proven livestock production technologies and innovations that are improving food security, economics, and environmental sustainability in high-income countries are not being utilized because they are not easily transferrable (Goldstein *et al.,* 2015). Ruminant breeding in most LAC countries is highly dispersed. Sector-wide improvement has been a challenge. In the future, LAC livestock breeding programs will likely focus on other attributes in addition to production and productivity, such as product quality, the improvement of animal welfare, disease resistance and the reduction of environmental impact. The tools of molecular genetics are likely to have considerable impact in the future as well (Thornton, 2010) and this may stimulate some research to value native or criollo breeds well adapted to LAC conditions.

Climate change and the LAC livestock industry

Agriculture, and consequently food security and livelihoods, is already being affected by climate change (Porter *et al.,* 2014; IPCC, 2014). Climate change and the LAC livestock industry are intertwined in three general ways. First, the LAC livestock industry is a major contributor of greenhouse gas (GHG) emissions. Second, climate change affects the spread and prevalence of animal diseases. Third, climate change impacts the availability and cost of animal feeds. Although disagreements remain regarding the quantification of GHG produced by livestock, a recent study reports that cattle account for 77% of GHG emissions and that monogastrics contribute only 10%, of which 56% of total emissions is from methane derived from manure (Herrero *et al.,* 2013). The study also concluded that Latin America and other developing regions of the world contribute 75% of global GHG emissions from ruminants and 56% from monogastrics with mixed crop-livestock systems producing 61% of ruminant GHG, and livestock grazing systems, 12%. The report concludes that LAC, along with other regions of the world, had the highest total emissions, mainly driven by animal numbers and the predominant production systems.

Climate could also directly impact the LAC livestock industry through its influence on animal diseases, vectors, and pathogens, and livestock habitat (Pinto *et al.,* 2008). Enhanced animal disease surveillance systems and disease reporting in South America are lacking, particularly for vector-borne diseases, to advance knowledge of disease distribution and impacts, and to improve preparedness for early response. Climate change impacts on the spread of animal diseases in South America can be mitigated by better reporting, prevention, and intervention measures in susceptible livestock and wildlife populations. Critically needed are contributions from multidisciplinary experts, including meteorologists, epidemiologists, biologists and ecologists, and from local communities. The negotiations under the aegis of the United Nations Framework Convention on Climate Change (UNFCCC) that took place in December 2014 in Peru established the foundation for a proposed new global agreement on joint actions to mitigate climate change effects that is expected to be finalized in Paris at the end of 2015. Whether the agreement will effectively incorporate sustainability of livestock enterprises relative to climate change remains to be seen.

Goldstein *et al.,* (2015) suggest that climate change will have at least three major impacts on livestock feed supplies. First, crop productivity will be negatively affected. The authors call for increased investment in agricultural research to maintain feed production levels in order to combat climate change. Second, climate change will tax the current technology related to resource conservation. The authors suggest additional research to develop more effective resource-conserving management practices. Finally, climate change will likely pressure existing water supplies. In this regard, the authors recommend increasing investments in crop irrigation technology and systems. New emphasis on the development of water supply systems will also be needed. The Global Environment Facility (GEF) has funded an increasing number of projects in LAC related to livestock and climate change, which demonstrates the governments' growing interest in, and awareness of, this issue.

Livestock disease outbreaks grow along with production

The current pace of expansion of the LAC livestock industry cannot be sustained without research into the incidence and epidemiology of animal diseases, as well as the implementation of effective training and disease management systems. Over the last two decades, the greatest challenge has been the lack of resources to combat the spread of infectious diseases (Goldstein *et al.,* 2015). Infrastructure is also lacking in some countries of the region to combat animal and zoonotic diseases. Especially needed are disease specialists and diagnostic laboratory facilities to focus on the etiology of diseases. A critical need is knowledge about the presence, prevalence, drivers, and impact of zoonoses. Even though foot and mouth disease (FMD) has been endemic in South America for over a century, Brazil has managed to reduce the incidence of the disease dramatically. The Brazilian Ministry of Agriculture, Livestock and Supply (MAPA), state governments, and private enterprises have worked together to immunize more than 97.8% of Brazilian cattle and buffalo against FMD throughout the country (The Cattle Site, 2015). The eradication effort is important for the maintenance and opening of new international markets, with Brazil expected to account for about 45% of the world market for meat by 2020. Central America and the Caribbean countries are free of FMD without vaccination (Estrada and Orozco, 2014). Chile is also free of FMD without vaccination. Over the last five years, FMD outbreaks have been drastically reduced in the region. Andean countries utilizing the progressive pathway to the FMD control recommended by FAO since 2011 obtained excellent results; Peru was declared free from FMD in 2014; the highland zone of Bolivia

was declared FMD-free without vaccination in 2014; and, Ecuador was recognized as FMD free with vaccination during the last conference of the World Organisation for Animal Health (OIE), in May 2015.

Other LAC livestock disease concerns

Although Brazil reported its first case of BSE in 2012 and another case in 2014, both cases are now considered "atypical," meaning that the disease was not contracted from feed (ProMED-mail, 2015). In fast, no case of classic BSE has ever been detected in Brazil. Although the World Organisation for Animal Health continues to maintain Brazil's status as a country with an insignificant risk of BSE, more than a dozen countries banned Brazilian beef after the first BSE case. The second case caused Peru and Egypt to impose new 180-day beef import bans. Bovine brucellosis is endemic in Argentina despite good regulations to control and eradicate it (Aznar *et al.,* 2014). The prevalence of the disease in countries bordering Argentina is quite variable (0.04% in Uruguay, 10.20% in the north of Brazil but only 0.06% in the south of the country, 0.2% in Chile, 3.15% in Paraguay, and 2.27% in Bolivia). Anthrax is also endemic in Argentina with multiple outbreaks of the disease every year for the last 25 years. Human negligence in not vaccinating livestock is the main cause (Noseda, 2013).

The global spread of avian influenza (AI) is a concern for LAC countries. In Mexico, the price of chicken meat increased by 10% in 2014 due to the continuing effects of the 2013 AI crisis (mostly H7N3) and the drought in the US. A significant shortage of poultry due to production cuts by large Mexican poultry producers persisted until imports were ramped up to meet domestic demand. The Mexico AI outbreak is reportedly under control just as an outbreak in the US takes hold (mostly H5N1 but also H5N2, H7N3, and H5N8) and is spreading geographically. Although AI surveillance has been limited in most LAC countries, no new reported AI outbreaks in LAC have been reported outside of Mexico in the last year (ProMED-mail, 2015).

Although most countries in Central America have been declared free of classical swine fever (CSF), the disease has persisted in Guatemala and much of South America. The last outbreak in Guatemala was reported in 2012. The following year, USDA's Animal and Plant Health Inspection Service (APHIS) transferred one million doses of classical swine fever (CSF) vaccine to Guatemala's Ministry of Agriculture, Livestock and Food to help contain the spread of the disease. The main problems related to CSF are in Haiti and the Dominican Republic, where recent outbreaks indicate the need to implement a binational strategy to control the disease on the island.

Growth in LAC livestock production and the environment

Over the last 20 years, large forest conversions have occurred in the Amazon basin, although forest area has increased in some parts of LAC due to land abandonment (UNEP, 2007). Considerable expansion of crop land planted to soybeans has occurred in South America over the last 30 years. About 70% of deforested land in the Amazon is used as pasture, with feed crops planted on much of the rest (Ballantyne, 2012). Some cropland has been converted to other uses, including urban development around many major cities. The abundance of land throughout South America has slowed the introduction of new technologies that can raise productivity (Thorton, 2010). Nevertheless, some change toward more intensive mixed crop/livestock systems and dairy production has occurred in LAC, facilitated by investments in transportation infrastructure and the conversion of pastureland into cropland (Fernside, 2005; Caviglia-Harris, 2005; Kirby *et al.,* 2006; Wassenaar *et al.,* 2007). A shift from extensive to intensive livestock systems is of-

Table 5. Percentage change in meat exports, 2000-13 and export share of domestic supply, 2013, LAC and selected countries

	Argentina	Brazil	Chile	Mexico	Paraguay	Uruguay	LAC
	% change						
Beef Exports	-43.7	241.4	285.0	23.3	442.5	33.2	101.9
Export share	7.3	19.7	2.8	19.7	66.2	60.8	11.4
Pork Exports	320.0	330.0	2850.0	130.0	278.0	-10.5	340.8
Export share	3.7	14.5	27.0	5.6	1.6	0.2	10.5
Sheep meat Exports	102.1	0.0	54.7	-30.0	0.0	-17.8	1.5
Export share	5.1	0.0	32.5	0.12	0.0	50.2	7.1
Poultry Exports	603.5	296.4	286.7	a	0.0	a	325.4
Export share	15.8	29.1	15.8	0.3	0.0	13.1	17.8

[a] Large percentage change from a small number.
Source: Calculated from data in OECD-FAO (2014).

ten seen as potentially helping to reduce deforestation rates. The problem is that growth of intensive, non-ruminant production creates pressure not only to convert deforested pasture land to crops but also to clear forest land specifically for feed production (Herrero *et al.*, 2009). Sustainable livestock grazing systems, including agroforestry and silvopastoral systems, are being developed in Colombia and some Central American countries. Uruguay and Ecuador are developing climate-smart livestock production and land restauration projects financed by the Global Environment Facility (GEF), to enhance climate change mitigation and restoration of degraded lands. Bio-economic models including environmental coefficients are being used by Brazil, Uruguay, Argentina and Paraguay to promote sustainable livestock practices in a joint project involving research institutions and the FAO (FAO, 2015).

LAC meat export performance

LAC exports increased across all meats between 2000 and 2013 (Table 5). Beef exports more than doubled and now account for about 11% of total LAC beef production. Paraguay and Uruguay each export about two-thirds of their production. Argentina's beef industry continues its struggle to recover from a severe drought in 2008. Following a 2009 sell-off of cattle in Argentina and a surge in its beef exports, subsequent beef shortages led to a 44% reduction in Argentinian beef exports between 2000 and 2013. Argentine farmers are reportedly reluctant at present to maximize cattle and beef production given government export restrictions, including a permit system and a 15% tax, which constrain beef price increases. Central American countries continue to suffer a general lack of livestock product export competitiveness, despite the many free trade agreements to which they are signatories, due to perceived weak animal health and food safety systems (Martínez, 2012).

Pork and poultry export success

The big export story in LAC is the phenomenal growth of both pork and poultry exports, particularly by Brazil and Chile (Table 6). Chile's pork exports have increased dramatically,

while Brazil's have more than quadrupled over the same period. Exports account for 27% and 14.5% of Chile's and Brazil's pork production, respectively. The Chilean pork industry struggled to combat an outbreak of porcine reproductive and respiratory syndrome (PRRS) in 2013. PRSS is relatively new to Chile and has hindered technical progress in the industry. No PRRS vaccines are currently allowed in Chile (van Dooren, 2014). Porcine epidemic diarrhea virus (PEDv) outbreaks have not yet advanced as far south as Chile.

Brazil continues to be the leading LAC poultry exporter, accounting for nearly 92% of all poultry exports in the region. Driven by beef supply problems, new export opportunities, lower feed prices, and greatly improved sanitary conditions, however, Argentine's broiler industry is growing rapidly with production projected to reach record levels in 2015. Although Argentina only exports about 10% as much chicken as Brazil, its exports have grown 128% since 2008 compared to 18% in the case of Brazil. Furthermore, Argentina now exports more chicken to its Latin American neighbors than Brazil does.

Dairy production growth, falling imports

Latin American countries have mainly been net importers of dairy products, accounting for nearly 18% of global whole and skim milk powder imports in 2013 (OECD and FAO,

Table 6. Projected percentage growth in meat and dairy product production, per capita consumption, and exports in LAC, selected LAC countries, the US, and the World, 2014–2023

	Uruguay	Argentina	Brazil	Chile	Mexico	Other LAC	LAC	U.S.	World
	Change %								
Beef Production	17.9	16.2	12.8	20.8	9.3	91.8	14.7	6.7	12.1
Consumption/capita	9.5	1.5	4.0	4.3	0.9	43.3	22.7	-1.5	2.3
Exports	21.2	65.1	20.8	-93.5	4.1	94.4	2.4	42.3	20.7
Pork Production	15.9	30.4	17.8	35.5	12.8	26.1	20.9	9.1	10.7
Consumption/capita	10.1	14.4	10.3	14.6	4.5	9.1	10.4	-2.1	1.0
Exports	0.0	153.7	12.0	63.7	-6.5	74.1	23.8	23.2	17.2
Sheep meat Production	27.1	3.6	5.5	-0.1	8.5	13.2	13.5	-3.1	22.8
Consumption/capita	9.7	-3.3	0.0	7.8	-12.2	0.0	1.8	-11.1	11.1
Exports	40.1	-1.8	1125.0	-41.3	42.8	-102.2	24.4	0.5	12.5
Chicken Production	20.5	22.8	15.3	12.9	26.9	27.4	19.9	19.8	22.3
Consumption/capita	12.8	6.2	5.3	7.4	9.5	11.1	8.5	10.2	11.6
Exports	41.5	98.2	23.1	-41.4	90.1	25.5	100.6	27.2	29.0
Dairy Products[a] Production	28.4	10.8	12.7	13.5	22.2	18.8	15.9	0.6	23.5
Consumption/capita	24.9	3.7	5.8	5.9	11.4	2.9	6.3	-6.0	12.7

[a] Fresh dairy products as defined by OECD-FAO (2014).
Note: 1/ = Large percentage change from a small number.
Source: Calculated from data in OECD-FAO (2014).

2014). Rapid growth in per capita incomes in the region has boosted demand for dairy products and for imports. However, growth in LAC dairy production over the last decade, particularly in Brazil and Mexico, reduced net imports of powdered and whole milk by over 50% and 67%, respectively, between 2000 and 2013 (FAO, 2015). Venezuela is the largest importer of dairy products in South America and the second largest dairy importer within the Americas, trailing only Mexico. Given its dependence on oil exports, however, Venezuela will likely be forced to reduce many imports, including dairy products, as long as oil prices continue to plummet.

Outlook

In the past, much of the growth in LAC meat and dairy production came from increased scale of operation to support extensive livestock practices. In the future, growth of the industry will increasingly flow from efficiencies gained through enhanced technology adoption and vertical integration. Much of the growth will come from operations located close to major urban areas in the region, allowing them to take advantage of the rapid growth in livestock product demand. Smaller operations in those areas may benefit through contract production or by supplementing the supplies of urban food wholesalers and retailers. In more remote areas where the conditions and infrastructure are as yet unsuitable for large-scale commercialization of livestock production, family farmers and smallholder associations may benefit from the spillover effects of urban growth but are more likely to service the needs of local economies. In those areas, small investments in infrastructure, the extension of training, and the delivery of new technology, such as improved genetic material, more efficient production management systems, animal health services, and other modern inputs, could generate large social returns by enabling small and medium-sized operations to participate more fully in the benefits of the industry's overall growth.

The growth of LAC meat and milk production to match increases in consumption and export demand

LAC meat and dairy production is expected to continue its rapid growth, largely on the same trajectory as over the previous decade (Table 6). The rate of production growth will be sufficient to allow for additional growth in both consumption and exports. In the process, LAC's share of world livestock inventories, meat supplies, and world meat exports will expand, along with per capita meat consumption. Key factors in the expected performance of LAC's meat industry include an expected decline in feed grain prices, growing intensification of production, relative growth in per capita incomes, a permanent shift in LAC consumer preferences from beef and sheep meat to chicken and pork, and policies designed to encourage production while minimizing the environmental impact.

Beef production and demand potential

Argentina, Uruguay, and Brazil are expected to spearhead 14.7% growth in LAC beef production between 2014 and 2023 (Table 6). Although expected growth in LAC per capita incomes and meat consumption will spur production, foreign demand growth will be a key factor in the continued expansion of the LAC beef industry as well. US demand for beef imports is predicted to continue growing, following several years of drought and a consequent reduction in US beef supplies. At the same time, LAC will benefit from the Russian ban on food imports, including beef, from the United States, Norway, Canada, Australia, and the European Union (EU).

Brazilian beef production is expected to grow 13% between 2014 and 2023, leading to a 21% surge in exports but little growth in per capita consumption (Table 6). The growth of production will be supported by meager, government-subsidized investments in genetics, pasture, machinery, and cold storage capacity, improved genetics, and other government programs. A lack of needed investment in infrastructure and services to encourage country-wide expansion of production will continue to limit the poverty-alleviating potential of the growth in Brazil's cattle and beef industry.

Although Argentina's beef export restrictions are expected to continue at least in the short run, as its cattle inventories continue to recover from the worst drought in 50 years, the Argentine government is beginning to promote beef exports to China and elsewhere. By 2023, Argentine beef exports are expected be up by nearly 65% over 2013 (Table 6). Argentina's beef export policy is an excellent example of the law of unintended consequences. The drought encouraged Argentina's government to ban beef exports, initially for 180 days, in an effort to restrain rising beef prices. Then a 15% export tax was placed on fresh beef exports, a tax that is still in force. The export tax choked off exports and domestic beef prices dropped as expected. However, the government assumed ranchers and farmers would continue to raise cheap beef. But instead, they cut their herds and converted their pastures to soybean production, which was more profitable than raising cattle for the artificially depressed beef market. As a result, declining beef supplies drastically cut beef consumption, while soybean production soared on new acres converted from pasture and other crops like corn. The results, among other things, include greater crop production pressure on fragile lands, reduced production of other crops like corn, and less production of grass-fed beef which historically has been the focus of foreign demand for Argentina-produced beef.

Continuing challenge to Brazil's dominance of LAC pork industry

Brazil's dominance of LAC pork production will be challenged by other countries in the region. Although Brazil's pork production is expected to grow by 18% between 2013 and 2022, the average growth of LAC pork production is expected to hit about 21% over the same period, led by Uruguay, Argentina, Mexico, and Chile (Table 6). Chile's emergence in the global pork industry will continue to be of concern to powerhouse pork producing countries like South Korea and Japan.

LAC poultry production doubled over the last decade but is expected to expand by only about 20% over the next decade (Table 6). In 2014, China imported broiler meat primarily from Brazil, the US, Argentina, and Chile. China is expected to approve eight new Brazilian poultry facilities in 2015, resulting in 36 total approved plants. China's recent ban on US poultry imports due to increasing incidence of HPAI in US poultry operations is setting the stage for major new growth of LAC poultry exports to China. Between 2014 and 2023, LAC poultry exports are expected to double, based on an expected 20% increase in production with an 8.5% increase in per capita poultry consumption over the same period.

Continued growth in LAC dairy production

Milk production in Latin America is expected to continue increasing, although at a slower 16% rate over the next decade compared to the 35% achieved over the previous ten years (compare tables 3 and 6). Lower energy and feed prices, however, will pose a challenge to the comparative advantage of the pasture-based milk producing system of Latin America over grain-fed systems in developed countries. The consequent downward pressure on dairy production could result in additional LAC dairy imports, particularly if economic recovery stimulates increased demand.

Brazil's rapidly growing dairy industry has been transformed from a net importer of dairy products to a net exporter, and overtook Russia in 2013 to break into the top five milk-producing countries in the world. Only the European Union, United States, India and China produce more milk. Brazilian producers' relatively low pasture-based production costs and rapidly improving genetics will help support a 13% expansion in Brazilian dairy production between 2014 and 2023. Continued but relatively small Brazilian government support for herd rebuilding and genetic improvements may support growth of the dairy industry to some extent. Significant expansion into world dairy markets will require Brazil to resolve continuing supply chain and dairy quality issues.

Future of oil price linkage to LAC livestock industry

Whether intensification of the LAC livestock industry will expand and begin taking substantial pressure off the region's environment over the next decade will depend largely on what happens to feed prices, the biggest cost involved in intensified livestock production operations. And what happens to feed prices will depend in the main on what happens to oil prices and the demand for corn and other grains as ethanol feedstock. Crude oil is currently trading at around USD 50/bbl. Even optimists are forecasting that an increase to as much as USD 70/bbl by the end of 2015 is unlikely. Most analysts estimate that oil prices will not return quickly to the USD 90-100/bbl level which was the norm for much of the last decade. Low oil prices should deflate ethanol prices and, therefore, grain prices unless ethanol demand expands, which depends on whether the current blend wall can be raised in the years ahead. The blend wall has occurred because a 10% ethanol–90% gasoline blend has become the accepted maximum feasible blend for all models and years of gasoline-powered vehicles. If ethanol demand does not expand in the future, rising corn yields will likely shift corn back to a chronic oversupply in developed countries, with relatively low prices except in years of adverse weather (Wisner, 2014). Instead of ethanol driving corn prices, the reverse may become the case with ethanol prices being heavily influenced by corn's impact on ethanol production costs. Corn is by far the largest cost component of corn-starch ethanol production. The Chinese economy and other global feed demand developments will also continue to be important influencers of corn prices. Their impact, however, may be less than when ethanol was a rapidly expanding industry.

Increasing the profitability of intensive production systems

Intensification of livestock production is often touted as a means of reducing the environmental footprint of livestock in the region (Kaimowitz and Angelson, 2008). Nevertheless, over the years LAC cattle producers, particularly in South America, have not moved to more intensified production systems in any meaningful way because of the comparative advantage of extensive systems, given the relative abundance of potential pasture land that still remains in the region. The forecast for lower feed prices following years of record price levels, however, could finally begin to erode that comparative advantage by enhancing the profitability of fattening cattle in feedlots rather than on pasture. Given the relatively high cost of capital required for more intensive production, along with increased financial risk, lower feed prices will not likely result in a wholesale shift of LAC cattle production from extensive to intensive systems. However, a sustained reduction of feed costs could go a long way to incentivizing grain-fed over grass-fed beef production systems.

The slower expected future rates of LAC meat and dairy production growth over the next decade could also help reduce the environmental footprint of the livestock

industry in the region. Less rapid expansion of LAC beef production will help slow the expansion of pastureland in the Amazon and other forested areas in the region. The slower growth of poultry, pork, and milk production in the region will generate less pressure to clear forested areas to grow feed crops. If the demand for pork and poultry in LAC countries increases faster than that of beef, however, the result could actually be an increase in the rate of forest loss over the years from increasing feed production relative to that of extensive cattle production.

The challenge for the future is to develop a regional plan that includes effective incentives and sustainable production system options to maintain profitability of livestock and feed grain production while lowering their environmental impact. Without such a plan, large-scale intensification and diversification of livestock production in LAC will happen only when land becomes the limiting production factor in forested areas. el etanol era una industria en rápida expansión.

Progress in reducing outbreaks of animal diseases

Important progress has been made in eradicating some animal diseases, such as FMD in South America. More countries are being recognized by the World Organisation for Animal Health (OIE) as free of FMD with or without vaccination. With the trend to larger-scale commercial livestock production enterprises in the LAC, particularly for non-ruminants, and greater intensification, a gradual decline in endemic and epidemic diseases that are both easier and more important to control in intensive systems is likely. There could also be an increase in diseases associated with animal crowding and environmental degradation (Perry *et al.,* 2011). At the same time, an increase in the food-borne diseases often associated with poorly regulated intensive production, such as *Campylobacter* infections in poultry, would be expected.

Furthermore, as small- and medium-scale producers gradually intensify, the demand for health, feed, and genetic resource input services will grow, surpassing available public sector services infrastructures. Because these operations are growing primarily near urban areas, the high densities of animals in close association with people will create continuing and growing human health risks. According to Perry *et al.,* (2011): "The lack of knowledge and awareness of risks, coexistence of wet markets and backyard production, presence of regulatory vacuums, and inadequate services from public or private sector suppliers, among other weaknesses, will present major challenges for the development of effective services and perhaps, demand models other than those prevailing in the West." Perry *et al.,* also argue that the small numbers of livestock in more remote areas and the slow rate of change in animal production practices in those areas may reduce the risk of emerging animal diseases but operate under poorly designed control measures. The consequences will be continuing outbreaks in these areas and poor control, although at least public policies to increase access of family farmers to rural services are in place.

Over time, future trends in animal diseases in LAC countries may be impacted by climate change in at least two ways (Thorton, 2010). First, climate change may shift the geographical areas where the climate is suitable for various diseases. Improved diagnosis and early detection of livestock diseases will be needed as disease patterns change. Second, climate change may lead to flooding in some areas and reduce access to water in others impacting the geographic distribution and incidence level of animal diseases that are associated with water.

Unfortunately, important knowledge gaps exist relating to many livestock diseases and their relationship to environmental factors, including climate.

Future disease trends are also likely to be impacted by the availability of effective disease surveillance and control technologies (Thorton, 2010). While effective control measures already exist for many animal diseases, whether and how effectively they are implemented in LAC countries will largely determine the future trend of livestock diseases in the region.

Policy recommendations

Even if the region manages to facilitate broad-based economic growth at all levels and improve the economic welfare and nutritional well-being of consumers, continuing growth of the LAC livestock industry will call for greater efforts from governments and the private sector to reduce possible risks to human and animal health and the already fragile environment. The growing discussion and promotion of One Health approaches in many different forums, both scientific and non-scientific, is an indication of the increasing popularity of integrated strategies for dealing with the animal-human disease interface. Of the possible measures that could help minimize the risks and maximize the benefits of the growth of the LAC livestock industry, the following could prove most beneficial: (1) measures to relieve constraints to the development of the industry; (2) investments in livestock research and extension services, including technical assistance, credit, insurances and access to markets for family farmers; (3) measures to minimize the environmental impacts of livestock; (4) policies to minimize the incidence and consequences of livestock diseases; and, (5) measures to assist the livestock sector to adapt to climate change and mitigate its effects.

Measures to relieve constraints to the development of the LAC livestock industry

Numerous policies, mechanisms, and systems have been proposed to relieve a wide range of barriers that limit the growth of the LAC livestock industry and its contribution to food security and poverty reduction in the region, including lack of access to technology, credit, resources, markets, information and training (e.g., World Bank, 2009). There is also no shortage of suggestions as to what is needed to promote the development of sustainable and profitable smallholder livestock production, including significant and sustained innovation in national and global livestock systems; improved regulation to govern contracts along food commodity chains, including acceptance and guarantee of collective rights and community control; enhanced antitrust laws to allow competition in pricing and procurement, and legal assistance in resolving contract disputes; effective social protection; stronger links to urban areas; and public investments in infrastructure (roads, warehouses, cold storage facilities, etc.), reliable transport and marketing systems, and communication and information systems to support critical decision-making and policy development (e.g., Pica-Ciamarra *et al.*, 2007; World Bank, 2009; Dijkman, 2009; Gura, 2008; Thorton, 2010).

Thus, the critical need for further development of the LAC livestock industry is not necessarily more policy proposals, but rather funding to implement already elucidated policies and programs to sustain development of the industry and to allow social and economic inclusion of family farmers who depend on livestock. Most LAC countries have developed various public, private, and public-private partnership mechanisms to fund actions in support of the general development of their livestock sectors and to allow smallholders to benefit from

that growth. Honduras, for example, recently established a loan program to stimulate cattle production and to improve the national cattle herd inventory (CentralAmericaData.com, 2015). Nevertheless, the massive investments still needed to reduce the identified barriers to growth of the industry far outstrip the funds available from any one source. Large-scale cooperation across the various public and private sources of potential funding will be needed to dismantle the key barriers to growth of the industry. Such cooperation could begin with the establishment of region-wide intergovernmental mechanisms dedicated to developing and coordinating the funding available from multiple sources. Interfacing with researchers, livestock producers, and government decision-makers and analysts, such an organization could synthesize an agenda for action from the many reports and research that have been done over the years and work with potential funding organizations to implement the agenda. The Community of Latin American and Caribbean States (CELAC) or other already existing organization could be potential platforms for undertaking this approach.

Investments in livestock research and development

The growth-promoting effects of sustained investment in agricultural research and the associated economic and social returns are well documented (see Alston, 2010). Research has achieved remarkable advances in livestock production, particularly in areas such as food safety, genetics and breeding, reproductive efficiencies, nutrition, and disease control, which has led to major productivity gains in various species (Goldstein *et al.,* 2015). The result has been lower costs of livestock products to consumers, enhanced food safety and food security, and reduced environmental impacts of livestock production. Much of the basic research behind these advancements, however, has been conducted and adopted in developed countries with both private and public funds.

Investments in research to adapt and adopt technology are more common in many Latin American countries although the ability to innovate, test, adapt, and adopt technologies and innovations in these countries remain marginal (Goldstein *et al.,* 2015). Along with most other developing areas of the world, the LAC region has underinvested in livestock research resulting in suboptimal progress in livestock health, productivity, and efficiency (Goldstein *et al.,* 2015). Investment is also required to improve extension services and access of family farmers to technical assistance, credit, insurance and markets. Investment in agricultural R&D as a percentage of agricultural output (R&D intensity) in Brazil and other South American countries is much higher than that of Central American countries but remains well below that of developed countries (Pardey *et al.,* 2010). A number of South American countries actively invest in the development and adoption of new technologies. The South American beef industry, for example, has been rapidly adopting modern technology. A key barrier to technological adoption in LAC, however, is the lack of extension work with smallholders about how to utilize new technologies for sustainable and improved production, as well as to articulate smallholder concerns and needs to the research community (Goldstein *et al.,* 2015). Continued growth of the LAC livestock industry will require investments to improve the transfer of existing knowledge and technology (both adoption and adaptation) to livestock producers, and particularly smallholders and medium-sized operations.

In addition, further advancement of the LAC livestock industry will require additional long-term investments in research and development in several areas designed to address the specific needs of the region:

- Adoption of new technologies, particularly in areas such as food safety, genetics and breeding, reproductive efficiencies, nutrition, and disease control;

- Animal breeding and genetics utilizing in-country indigenous breeds within production systems characterized by limited resources and other constraints appropriate for the environment;
- The reduction of emission intensities to help mitigate the effects of the expansion of the LAC livestock industry;
- Improved livestock feeding and management to enhance the efficiency of livestock production;
- Evaluation of alternative livestock production systems and resources, tradeoffs, and land-use changes that occur;
- Development of sustainable intensification methods that improve efficiency gains to produce more food without using more land, water, and other inputs; and,
- The potential effects of climate change on livestock and livestock systems.

Measure to minimize the environmental impacts of livestock

A major unintended consequence of the growth and development of the LAC livestock industry is the impact of that growth on the region's ecosystems, biodiversity, and natural resources. In Latin America, much of the expansion of meat and dairy production has come through expansion of herds rather than through increases in productivity, which has amplified the environmental impact of the industry. Major reductions in that impact are possible through research that improves production efficiency as discussed above (Hume *et al.,* 2011; Steinfeld and Gerber, 2010). For example, research investments that have enabled the development and adoption of modern beef production systems have also facilitated a substantial reduction in requirements for livestock numbers, feedstuffs, water, and land to produce a given volume of beef (Capper, 2011). Moreover, increased productivity facilitates a reduction in manure, methane, and nitrous oxide production, as well as in the carbon footprint for the production of beef.

The drive to increase productivity in Latin America while simultaneously ensuring minimal environmental impacts has led to calls for measures to encourage sustainable intensification of LAC livestock production (Goldstein*et al.,* 2015). Because intensification typically increases production efficiency, decreases land requirements per calorie produced, and lowers environmental impact intensities (e.g., CO_2-equivalent emissions per kilogram of meat), the transition toward more intensive systems will likely have environmental benefits (Capper, 2011; Rendón-Huerta *et al.,* 2014). There are potential negative impacts as well, including nutrient loading and pollution (Gerber *et al.,* 2013). Additionally, increased animal densities without the development of proper disease surveillance practices and regulations could lead to increased risk of zoonotic disease outbreaks (Herrero and Thornton, 2013).

Although still evolving, the concept of sustainable intensification involves more than just improving productivity and efficiency. Also included are creating the necessary incentives and investments for systems to intensify and developing regulations and limits for intensifying systems among other concerns (Herrero and Thornton, 2013). A number of authors have recommended various production practices as well as regulations and incentives to mitigate the negative environmental impacts of livestock production (e.g., Swinton *et al.*, 2003; Steinfeld *et al.,* 2006; Herrero *et al.*,2009; FAO, 2013). Production practices encouraged range from soil conservation measures to silvopastoralism and better management of grazing systems and livestock waste in intensive systems. Specific policy measures recommended include correcting market failures and policy-distorted price signals that discourage efficient resource use and foster misallocation and uncontrolled degradation of resources; strengthening land

titling to protect and enhance the long-term productivity of land; grazing restrictions; establishment of effective institutions to monitor environmental impact and to develop standards and enforce their implementation; measures to promote intensive land use; incentives to promote land conservation; and payments for environmental services such as carbon sequestration and biodiversity conservation. As new production practices and policies are implemented, collaboration among researchers, policymakers, livestock producers and others along the livestock supply chain is needed to ensure that the environment is protected in a way that producers can benefit (Herrero *et al.*, 2009). Research is also needed to develop technologies and processes that enable farmers to adopt pro-environment measures that have minimal impacts on the profitability of their livestock enterprises and to rescue important local breeds and value their products. Social and economic research is needed at the local territory level to promote local innovation, support smallholder and family farmer organization for developing new products and markets, as well as employment opportunities for young and women along local value chains.

Incentivizing changes in behavior by livestock producers could be more effective than regulations and associated penalties as a means of protecting the environment from the profit-driven growth of the livestock industry. A study in Mexico found that conversion of forest lands to pasture in heavily forested areas is driven predominantly by price incentives and concludes that effective price policies and pricing mechanisms would be the most effective means of encouraging environmentally appropriate behavior in an economically feasible way (see FAO, 2006). Eco-certification of farms and ranches is increasingly promoted as a way to incentivize producers to adopt greener practices. Eco-certification is intended to increase demand for meats and other products by enabling consumers who prefer green goods to identify and purchase them. The increase in demand is then expected to generate a price premium for green products, which, in turn, creates a financial incentive for producers to adopt sustainable production practices and become eco-certified. To achieve the desired results, an eco-certification program must set and enforce stringent standards but offer price premiums high enough to offset the costs producers pay to meet the standards and become eco-certified. This must assure public investments to guarantee smallholders access to financing and technology services, to prevent exclusion. The key to the success of the program is for sufficient demand for eco-certified products to be generated that the price for those products will increase enough to attract sufficient producers into the program. The more producers who participate, however, the greater the supply will be relative to demand, which will potentially limit the price premium as well as further participation in the program. Whether or not such programs work to reduce the environmental impact of the production is as yet unclear (Blackman, 2012).

Measures to minimize animal disease outbreaks

Continued growth of the LAC livestock industry will doubtless create a growing need to control outbreaks of animal diseases to facilitate the industry's growth and minimize local and regional incidence of human health impacts. The decades-long effort to eliminate FMD in South America provides an example of how such economically and socially impactful livestock diseases can be controlled. National FMD control efforts began in the region as early as the 1960s but were largely unsuccessful (Narajo and Cosivi, 2013); however, the progressive pathway strategy to FMD control implemented during recent years in the Andean region demonstrated that eradicating the disease is possible even in non-exporting

livestock countries with a high proportion of smallholders (FAO, 2014). In the 1980s, South American governments and livestock producers, working with researchers, livestock health professionals and others, developed and implemented a coordinated plan to eradicate the disease from the sub-region. Despite setbacks and plan revisions, about 85% of the cattle population of South America is now recognized as FMD-free (Clavijo *et al.,* 2015). The significant progress made on FMD control by South American countries has enhanced livestock productivity and helped establish the sanitary basis for sustaining a growing export market of livestock products. The lesson to be learned is that the control and eradication of other animal diseases in LAC countries will require an equally coordinated effort of the public and private sectors (Perry *et al.,* 2009). The public sector must ensure good practices through enforcement of new and existing regulations while the private sector must develop effective animal health management systems and related services.

Traceability systems continue to receive attention in LAC countries as an effective method of detecting disease outbreaks, facilitating a rapid response, and adding market value to livestock products. Several LAC countries have initiated the development of national animal identification, movement control, and traceability systems in response to export market opportunities. All cattle in Uruguay are now electronically tagged at birth in the world's first completely traceable meat process (Davies, 2014). Implemented in 2000, the Uruguay traceability system is the model for similar systems implemented recently in Nicaragua, Honduras, Guatemala, Panama, and elsewhere in Central America. The return on investment in the Uruguay traceability system reportedly has been USD 20 for every dollar invested in the system (IICA, 2013).

In addition, investments in research and education (e.g., training in biosecurity) are needed along with the development of monitoring systems to assist in predicting the impact of climate changes in the incidence of zoonotic diseases in endemic areas with various biological and social conditions. Active surveillance for livestock diseases in South America is woefully inadequate across the region (Pinto *et al.,* 2008). Disease reporting, particularly for vector-borne diseases and those that may be affected by climate change, is often lacking, which limits intelligence on disease distribution and impact and impairs the ability for early response. Improved disease reporting will require the active and coordinated participation of government agencies, livestock disease specialists, meteorologists, epidemiologists, biologists, ecologists, and livestock producers in local communities (Pinto *et al.,* 2008).

Climate change adaptation and mitigation strategies

A number of strategies to assist the LAC livestock sector in adapting to the effects of climate change have been suggested, including production adjustments such as diversification and intensification; breeding strategies to address not only the tolerance of livestock to heat but also their ability to survive, grow, and reproduce in conditions of poor nutrition, parasites, and diseases; policy changes such as promoting interregional trade and credit schemes, removing or introducing subsidies, insurance systems, and income diversification practices, and implementing livestock early warning systems; research to better understand how climate change affects livestock; enhancing producers' awareness of and training relevant to climate change; enhanced livestock management systems relating to water use, production efficiency, and herd composition; and more (Calvosa *et al.,* 2010). Suggested mitigation strategies include research to improve livestock energy conversion, feed efficiency, and the digestibility of feed; improved feeding management to reduce emissions; improved animal waste

management to reduce emissions; enhanced pasture management through rotational grazing; and simply achieving lower levels of livestock production and consumption. Bio-economic models with environmental coefficients may be a tool to support policy development and decision-taking by producers to incorporate sustainable livestock practices and strategies and improve climate change mitigation and adaptation of livestock sector.

Conclusions

Continued growth of the LAC livestock industry will support overall economic growth in the region, help meet the nutritional needs of a growing population, and contribute to food security and poverty alleviation across the region. Growth of the industry, however, is creating complex and unintended consequences in the form of environmental degradation and animal and human health concerns. These will require well-funded, broad-based, and intensive public and private palliation strategies.

Further advancement of the LAC livestock industry will require additional investments in research and development designed to address the specific needs of the region. Research investments are needed in the development and adoption of new technologies and processes related to food safety, genetics and breeding, reproductive efficiencies, nutrition, disease control, emission intensity reduction, livestock feeding and management, sustainable intensification methods, and the potential effects of climate change on livestock and livestock systems. A wide range of other recommendations for advancing the development of the LAC livestock industry has been proposed. What is most needed now is the funding to implement those recommendations through public, private, and public-private partnership mechanisms. Investments are needed to improve the livestock productivity of family farming and reduce risks, as well as to increase smallholder access to technology, rural services and markets, and to enhance livestock's contribution to food security and sustainable rural development.

The movement toward sustainable intensification may help achieve needed increases in productivity, while ensuring that the environment is protected as the industry grows. An expected continued softening of oil and grain prices over the medium term at least may support the move of the industry toward greater intensification. The environmental consequences can best be approached through effective collaboration among researchers, policy makers, and livestock producers and others along the livestock supply chain.

Effective control of livestock disease outbreaks must be a priority both to facilitate the industry's growth and to protect against human health implications. Investments in research, education, and disease surveillance and monitoring systems are needed to alleviate the problems of animal diseases and zoonoses that result in enormous losses to animal health, animal producer livelihoods, national and regional economies, and human health. Traceability systems can also be effective tools in that process.

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Chapter 2.4: Fishing

Fisheries and Aquaculture

Meeting the growing global demand for animal protein from fishery products poses a major challenge to the sustainability of the world's fish stocks. Due to the pressure to increase the supply, more than 60% of the world's fisheries are being fully exploited and 30% are overexploited (FAO, 2014a). Over the last 15 years, catches in the main fisheries of Latin America and the Caribbean (LAC) have registered a historic decline, stabilizing at around 18 million tons per year, while aquaculture has experienced sustained growth. With the pressure on fishery stocks, management needs to be based on scientific information and more sustainable methods. Aquaculture should continue to grow in order to close the gap between the supply and the demand for fish protein. This calls for the promotion and implementation of aquaculture production systems based on ecosystem approaches (i.e., taking into account environmental sustainability and social well-being), along with an institutional framework designed to achieve a balance between demand and supply.

Facts

- Global demand for, and per capita consumption of, fishery and aquaculture products has never been higher (19 kg. per year in 2012).
- In LAC, consumption of fish and shellfish has also grown substantially in recent years, with per capita consumption in countries like Brazil, Peru and Mexico higher than the global average.
- Capture fishing is intense and variable, not only because of the impact of climate and oceanographic phenomena such as El Nino, but also on account of overfishing, underreporting, illegal fishing and the difficulty of controlling the activity.
- Aquaculture production in LAC has grown steadily since 2000 (71% in the period 2000-2013) and continues to set new records (2.5 million tons).
- Chile continues to be LAC's largest aquaculture producer. Its production is mainly industrial and dominated by salmonids (salmon and trout). Brazil has positioned itself as the second largest producer, with increasing volumes of tilapia and other Amazonian fish (FAO, 2015).
- Approximately 15% of family farmers in the region also engage in aquaculture, mainly producing low-trophic level species such as tilapia. These activities have boosted the economy of many rural communities in LAC (Flores Nava, 2012).
- Rising international fishmeal and fish oil prices have increased the costs of aquaculture production (especially in the case of salmon and shrimp), which have also been affected by the application of stricter sanitary control measures.
- With new diseases, such as early mortality syndrome (EMS) of shrimp, threatening the region's industry, international agencies and national animal health systems have begun to adopt sanitary control measures.

Trends

Part of the world's population will continue to depend on fishing and fishery products for their livelihood and food

The world's population will reach 9.6 billion in 2050. A high percentage of the growth will occur in urban coastal areas, so fishery products and byproducts will make an important contribution not only to the food supply, but also to the livelihoods and incomes of poor families.

Fishery products are one of the food sources whose supply has grown the most, thanks to increased demand from a burgeoning population, higher per capita income (mainly in developing countries), and the tendency to consume healthier food. These factors have made fishery and aquaculture resources some of the world's most traded foods; in fact, about 40% of all fisheries and aquaculture production enters international trade (FAO, 2014a).

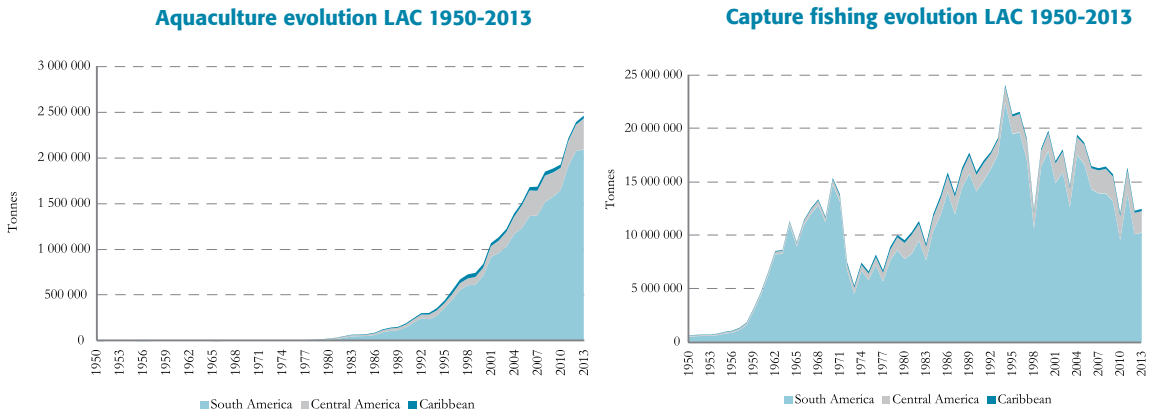
In 2013, the total value of fisheries and aquaculture exports exceeded USD 130 billion. Trade in fish and fisheries products is especially important for developing countries, which account for over 50% in value and 60% in quantity (live weight) of all exported fish and fisheries products.

It is estimated that some 12% of the world's population depend on capture fishing and aquaculture for their livelihoods. Artisanal fishers and fish farmers in LAC make up about 90% of the workforce in the sector (FAO, 2014b).

In 2013, LAC fishery production reached 15 million tons, with capture fishing accounting for 84% of the total and aquaculture for the remaining 16%. While the latter activity has grown 71% in the region over the last 13 years (see Figure 17), capture fishing has tended to remain stable at around 18,000 million tonnes in the last 20 years, with variations in production volume from one year to the next.

In LAC, artisanal fishing is a fallback activity in times of poor agricultural harvests and rural unemployment. Fishing can generate income instantly, so the number of occasional fishers increases significantly when unemployed rural dwellers have to resort to the activity. This can

Figure 17. Capture fishing and aquaculture production in LAC



Source: Created by author based on data from FAO 2015.

sometimes place excessive social pressure on aquatic resources, and also on the authorities. Unlike artisanal fishing, in times of financial crisis micro- and small-scale aquaculture grow and complement family farming, boosting the economies of many rural communities in Latin America.

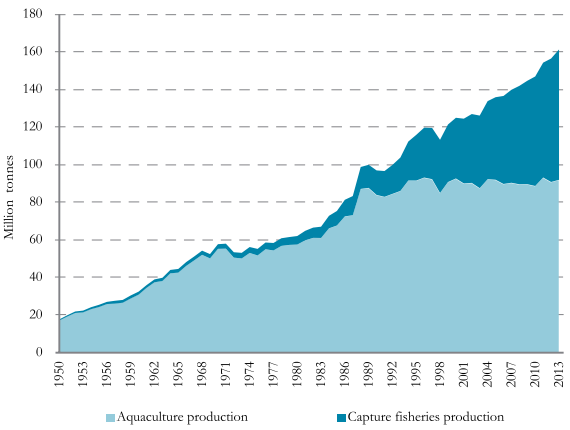
Industrial aquaculture continues to increase in importance in LAC; South America is the sub-region with the biggest production

Aquaculture is the fastest growing productive activity at both the global and regional levels. Its share of the region's domestic economies has also increased (Figure 18). Over a 20-year period, aquaculture production in LAC rose from 305,000 tonnes (1993) to 2.5 million tonnes (2013). Advances in research and technology development have fostered the growth of aquaculture, as have improvements in public policy and good governance in aquaculture, the need for which was identified in the Bangkok Declaration and Strategy of 2000 (FAO, 2001a).

Most international food agencies and specialists agree that in the near future aquaculture will become a major source of protein, with increased demand from a growing population. As a result, experts conclude that aquaculture is one of the subsectors with the biggest opportunities for investment (Maglio, 2014).

Despite its great potential, however, aquaculture could be negatively impacted by climate events and rises in the prices of commodities, the main feed inputs used in aquaculture. In addition, the emergence and spread of pathologies such as the infectious salmon anemia (ISA) virus, the *Caligus* parasite that affects salmon, and the outbreak of new pathogenic events in the region's shrimp industry, such as early mortality syndrome (EMS), could have a bigger impact on production and lead to intra-regional trade restrictions being activated.

Figure 18. World fishery and aquaculture production, 1950-2013

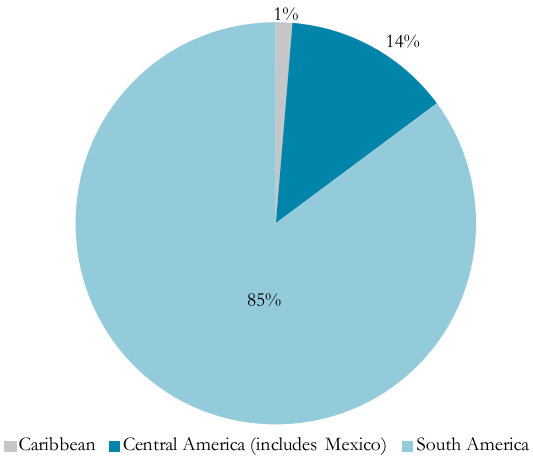


Source: Created by author based on data from FAO 2015.

Production of freshwater species has increased significantly

Although Asia still accounts for the biggest share of world aquaculture production (almost 98% of the total), LAC is the region with the highest growth rates, mainly due to the strong development of the subsector in Chile, Brazil and Ecuador, which are among the world's top 20 producers. The growth of aquaculture in Mexico, Peru, and Colombia is also worthy of note. In absolute terms, LAC produced around 2.5 million tonnes of aquaculture products in 2013, with South America contributing 85% of the total (Figure 19).

Figure 19. Breakdown of LAC aquaculture production in 2013



Source: Created by author based on data from FAO 2015.

Although aquaculture production in LAC is still dominated by species farmed in marine environments, there has been a significant increase in the production of freshwater fish.

The single biggest determining factor in aquaculture production in Latin America is the performance of Chile, the region's largest producer in 2013. The country produced more than one million tonnes, of which 73% were salmonids and 23% were mollusks (mainly mussels), with seaweed making up the remainder. When compared with the data for 2001, Chile's aquaculture production has grown by more than 70% in the last 13 years.

Salmonids are the most important species farmed in LAC aquaculture. They account for 34% of all aquaculture production in the region, with Chile the largest producer, contributing 94% of the total (FAO, 2015). In recent years, Chile was able to increase its production volume, following remarkable success in combating the ISA virus, which had caused a significant decline in the country's aquaculture sector. Important lessons learned from the ISA virus crisis have led to a steady improvement in the industry, which has implemented appropriate health measures and a number of other actions designed to protect this important industry. These developments have pushed up production costs, obliging the industry to be in a state of constant evolution and creating other positive externalities in the process (development of vaccines and other technologies, research, rigorous application of management standards and protocols, and greater quality control). It has become less competitive as a result, because stable international prices have reduced profit margins. This could have an effect on employment in the near future.

Shrimp is the second most important aquaculture species farmed in LAC after salmonids, with whiteleg shrimp (*Litopenaeus vannamei*) accounting for nearly all production. A shellfish with a high market value, shrimp is produced in several countries of the region and accounted for 26% of aquaculture production in 2013. That same year, 640,000 tonnes were produced, 64% in South America, mainly in Ecuador (FAO, 2015).

Ecuador accounted for 47% of the total, producing 332,000 tonnes in 2013 that constituted 92% of the country's aquaculture production (see Table 7). Having overcome some serious health problems, Ecuador's shrimp industry is presently in good shape, with substantial increases in international prices, mainly due to health problems in Asia.

The threat of new pathogens such as EMS, the apparent cause of mortality and morbidity on Asian farms, has sounded the alarm bells in the region, with some countries suspecting the occurrence of outbreaks and instituting preventive measures to prevent any possible spread of the problem. Shrimp production levels in the countries concerned appear to suggest that the primary outbreaks detected in Mexico have been controlled.

Production of freshwater fish in LAC enjoyed average annual growth of 8% in the period 2004-2013. Thanks to a significant increase in production volumes, these fish have gained importance as an alternative for generating income. In 2013, 722,000 tonnes of freshwater fish were produced in the region, with South America leading the way with 603,000 tonnes (see Table 8).

The term "limited resource aquaculture" (AREL) is now used to refer to a segment of the sector that is benefitting significantly from the activity, which is contributing to self-employment, food security and the nutrition of rural families in countries of the region. Apart from some exceptions in Brazil, AREL mainly involves the production of freshwater fish. At present, more than 100,000 rural families have at least one fishpond, allowing them to obtain proteins, fertilizers and complementary income. In countries such as Bolivia, Colombia and Paraguay, AREL and micro and small aquaculture enterprises contribute more than 80% of national aquaculture production.

Aquaculture is one of the product/income diversification strategies being promoted for family farmers, as it allows them to spread their risk and offset production costs. For those reasons, in Latin America micro and small-scale aquaculture are becoming an important generator of income and driver of growth in rural areas. Brazil is a case in point. With the biggest share of freshwater fish production in the region, micro and medium-sized enterprises are leading the aquaculture industry, tilapia being the main species farmed.

Table 7. Ecuador's aquaculture production from 2009-2012 (t)

	2009	2010	2011	2012	2013
Shrimp	179,100	223,313	260,000	281,100	304,000
Tilapia	37,461	47,733	48,000	39,818	23 920
Salmonids (trout)	500	500	500	500	3 200
Other crustaceans	300	0	0	0	0
Other freshwater fish	1000	970	1000	1035	1060
Total	218,361	272,516	309,500	322,453	332,180

Source: Created by author based on data from FAO 2015.

Given their limited resources, small-scale fish farmers use low-trophic species such as tilapia and carp, which, unlike salmonids, do not require foods rich in fishmeal and fish oil. This means that producers are not exposed to the impact that an increase in international prices of fishmeal and fish oil can have on the production costs of fish farming.

As for its contribution to the food supply, aquaculture has great potential to contribute to the generation of sufficient food for the

Table 8. Production of freshwater fish in LAC from 2009-2013 (t)

	2004	2009	2010	2011	2012	2013
Central America (including Mexico)	67,811	70,108	61,896	75,463	90,197	93,241
South America	256,851	490,217	574,304	550,385	608,187	603,563
Caribbean	31,763	36,548	30,998	23,721	23,587	26,139
Total	356,425	596,873	667,198	649,569	721,971	722,943

Source: Created by author based on data from FAO 2015.

population in the coming years, given that fish is a source of the high-quality protein and essential micronutrients needed to combat the problem of undernutrition at the global and regional levels.

It is forecast that by 2050 humankind will consume 70% more food than at present. Aquaculture will undoubtedly help meet that demand, as it is also predicted that land-produced food will only be able to contribute 10% of all the extra food required in the future (FAO, 2014a).

A large percentage of the fish populations being caught are at full exploitation levels, and about 30% are being over-exploited. The FAO believes that there is no possibility of increasing the volumes of about 90% of catches in the future (FAO, 2014b). In addition, cyclical ocean phenomena (such as El Niño) have reduced the availability of small pelagic fish in LAC. In Peru, for example, anchovy is expected to recover in 2015 after El Niño affected local activity throughout 2014, reducing the catch of this species to 2.2 million tonnes, compared with the nearly 6 million tons landed in 2013[24].

In this scenario, the increased demand for fish products could be a great opportunity for small farmers in LAC, especially artisanal fishers who focus on emerging or alternative species, such as squid. To benefit from this, countries should promote appropriate public policies for the development and protection of these subsectors.

Climate change and catastrophic natural phenomena pose a serious threat to fishery and aquaculture activities in LAC

It has been shown that different climate and oceanographic factors have affected the distribution and availability of anchovy in Peru and northern Chile. In the Caribbean, the devastating effects of hurricanes have affected the fisheries and aquaculture infrastructure; and in southern Chile, volcanic activity has had a serious impact on crops and fisheries (e.g., the Chaitén and Calbuco volcanoes).

According to various authors, climate change is causing both physical and biological changes in the distribution of marine and freshwater species. In general, temperate-water species are being displaced towards the poles, with consequent changes in the size and productivity of their habitats. It is believed that productivity is decreasing in tropical and subtropical seas, and increasing at higher latitudes. This phenomenon was highlighted by assessments of sardine stocks in south-central Chile, which detected a clear displacement of the fish population further north (IFOP, 2015). Climate change is also affecting aquaculture activities in areas where rainfall patterns have changed, such as certain areas of north-central Paraguay and South Atlantic regions of Brazil. A bigger impact is expected on more sensitive areas, such as coral reefs, wetlands, rivers, and lakes. (Blanchard *et al.*, 2012).

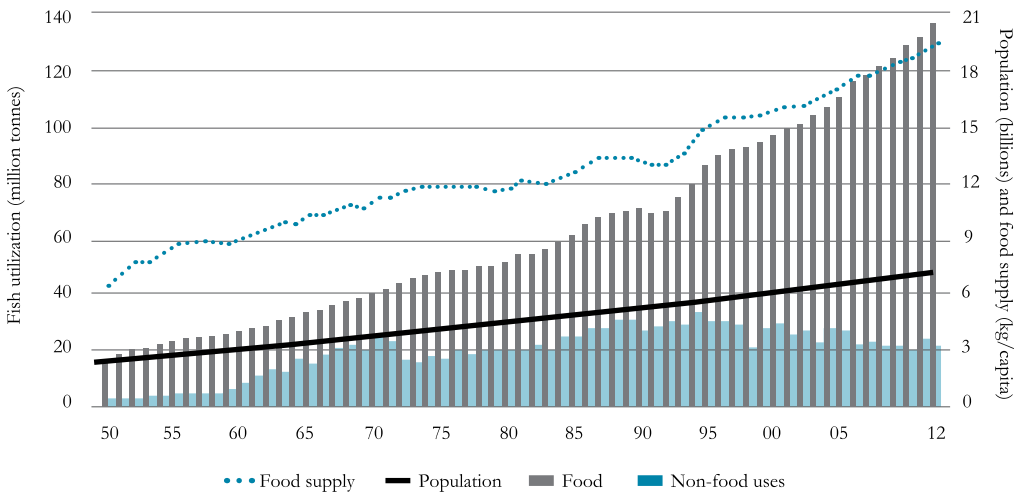
Outlook

The region's traditional fisheries are on the decline

The region's main fish stocks are either fully fished or overfished, leading to a steady drop in production. There are a number of examples in the region, including jack mackerel in Chile, where catches declined by over 80% in 10 years and are now subject to strict quota controls administered by the South Pacific Regional Fisheries Management Organization (ORP). Another case in point is anchovy in Peru and Chile, which suffers strong inter-annual variations and could be seriously affected by global climate change, mainly in equatorial and subtropical areas.

24 Conterno, E. 2015. Recuperación de la anchoveta (Personal Communication). Lima, PE, Sociedad Nacional de Pesquería.

Figure 20. World fish utilization and supply (FAO, 2014A)



Source: Created by author based on data from FAO 2014a.

Faced with deteriorated or drastically declining fisheries, the authorities should focus on maximizing the application of measures aim at their preservation and recovery, especially if there is continued pressure on fish stocks due to the sustained demand of a growing population.

Projections of traditional fisheries generate expectations that are regulated by the market, the main one being the higher price of resources for which there is high demand, which will increase as availability and supply decreases.

In contrast to the overexploitation and negative future prospects for capture fishing, aquaculture has experienced sustained growth in recent years. Aquaculture in Chile, with strict sanitary measures (especially for the production of salmon), has recovered significantly and in 2014 achieved record production of around 1.1 million tonnes (SUBPESCA, 2014). It could have grown even more but for the reduction in the growth rates of world demand for species produced in the country, which has obliged the industry to reduce its plans for expansion.

Therefore, aquaculture offers a great opportunity to supply markets where the demand cannot be met by capture fishing. In this context, LAC's major producers (Chile, Brazil, and Ecuador) will be the suppliers of salmon, freshwater fish, and shrimp, respectively. The prospects for emerging aquaculture industries should be mentioned, such as Peruvian scallop in Peru, whose growth will remain in double digits in the coming years.

The production of certain Amazonian species, such as *surubí*, and others that have been penetrating regional markets, such as *pacú*, *cachama*, and *tambaquí*, will continue to expand strongly, benefiting the economies of the rural areas where they are produced, mainly in Brazil, Colombia and northwest Argentina.

For their part, AREL activities will have an increasingly important social impact on employment, food and the contribution of resources. These activities may be vulnerable, because of their precarious nature and subject as they are to market fluctuations, the

environment, etc. The national authorities are therefore supporting and strengthening these social groups, whose social importance is increasingly being recognized in virtually all countries of the region. Hence, a new surge in aquaculture extension programs is under way, as can be seen in countries like Colombia, Peru, and Brazil.

Of course, not all areas of the region are alike. The situation varies but offers opportunities for the development of aquaculture (the environmental and ecological conditions generate ecosystems with multiple resources and, as a result, different business options, less competition among producers, and alternative ways of coping with likely adverse conditions). The same applies to industrial fishing, which obviously is different in each country, and also within countries. Therefore, communities of artisanal fishers should play a leading role in aquaculture production and not only in capture fishing. Consequently, growth will go hand in hand with the development of not only industrial aquaculture but also small and medium-scale enterprises as well.

It has been forecast that by 2050 humankind will consume 70% more food than at present. Aquaculture could undoubtedly make a major contribution to meeting that big expected increase in demand (FAO, 2009).

In many parts of LAC, artisanal fishing is not only a fallback economic activity but a way of life, and very important for cultural and tourism reasons, helping to boost the economies of many rural communities in LAC. In several places, aquaculture, fishing and family farming are complementary and grow together.

Micro, small and medium-scale aquaculture could grow significantly if States encourage its development. This includes not only the development of aquaculture species for direct human consumption, but also those that can be used in other areas of the economy, such as seaweed, which is being promoted and developed in Chile, and, to a lesser degree, in Brazil, Mexico, and Peru.

The scenario for the region's aquaculture in 2025 suggests that the main challenge will be to improve the competitiveness of production regardless of the scale, bearing in mind that a steady rise in the prices of ingredients for balanced feed is expected. Other major challenges will be the control of transboundary diseases, outbreaks of which increase with greater inter-continental trade flows; the promotion of best aquaculture practices; the standardization of systems for the certification of sustainable practices; and greater political recognition of the social and economic importance of aquaculture, and of its contribution to the food supply.

In the case of industrial aquaculture, within ten years' time all of Chile's salmon farmers are expected to have obtained international certification for their use of best practices; pests will be under control; new species will have been introduced into commercial aquaculture; and consumers across the globe will be more aware of the nutritional benefits of fish and shellfish.

Aquaculture has a very promising future in LAC, but its development will depend largely on the public policies implemented to support it. A case in point is the establishment of coastal areas for the exclusive use of organizations of artisanal fishers, which allows them to be both users and stewards of the resources present. To achieve harmonious development, the incorporation of technology and capital needs to be factored in. Partnerships of fishing communities and private capital should also be considered, in order to develop new technologies and processes. There are many species of invertebrates, fish and algae with great potential for farming that could benefit from such partnerships.

It is important to note, however, that coastal areas that could be used for the purposes mentioned may also be the areas most affected by climate change and the increasing pollution of coastlines. Seaweed farming could be very useful for mitigating those problems. For capture fishing and aquaculture activities to be sustainable, it will undoubtedly be necessary to efficiently plan the use of coastlines and bodies of freshwater, based on the determination of optimum production levels.

It should be pointed out that no increase in fish consumption is foreseen in LAC in the short term, mainly because of price levels and the difficulties that all segments of domestic markets face in accessing fishery products. With the exception of AREL producers, who produce inexpensive species, fishers and fish farmers are increasingly specializing and improving their practices in order to gain access to international markets. This is reflected in the high prices of such products, which are beyond the reach of most consumers, who therefore consume cheaper products, such as poultry and pork. In recent years, inexpensive species of fish have been introduced into LAC, mainly from Asia. However, fish like pangasius are still more expensive in local markets than poultry and pork products. Some governments have launched campaigns to encourage fish consumption, but to achieve meaningful results such efforts must be coupled with affordable prices, which is a challenge that has yet to be addressed.

Policy recommendations

The strengthening of institutions and regional coordination are key to the development and growth of fishing and aquaculture in LAC

According to ECLAC, FAO, and IICA (2014), public policy for agriculture and rural areas should help to eliminate hunger, food insecurity and malnutrition; make crop farming, forestry and fishing more productive and sustainable; reduce rural poverty; promote inclusive, efficient agricultural and food systems; and make livelihoods more resilient to disasters.

For ecosystem management of fisheries and aquaculture (including equitable access to resources and social protection programs), institutional and local (community) capabilities need to be strengthened. The situation of the fisheries and aquaculture sectors is very diverse across the countries of the region. For that reason, the particular circumstances of each country and/or territory must be assessed in designing long-term policies. The institutional framework is a key factor, however. Implementing policies in a consistent way calls for a robust institutional framework. An appropriate institutional structure is needed to contribute effectively and efficiently to the development of the fisheries and aquaculture sector of a given nation or region, as well as policies and regulations that allow fisheries and aquaculture to develop in a coherent, sustainable and responsible way.

It is important to promote the design of an institutional architecture that includes fisheries and aquaculture in a visible and coherent way. The scale of the structure, the hierarchical importance attributed to it, and the resources allocated must be sufficient to make it possible to harness the country's potential and permit the sustainable management of fish stocks and aquaculture resources.

Having a modern legislative framework for the sector is essential, with robust policy instruments, well coordinated at the national and regional levels, that interact with other local development policies, complementing efforts and tapping opportunities. The instruments should be designed with the participation of the stakeholders.

The ecosystem approach should be applied in the management of fisheries

In the past, fisheries, and the fishing-aquaculture sector in general, were administered with a short-term vision that generated temporary jobs and income but over time did enormous, and in some cases apparently irreparable, damage. This has resulted in economic and social losses. Fortunately, a paradigm shift is now taking place.

Today, countries need to implement management actions based on the best scientific information available, obtained through independent fisheries research. Such research should be carried out within the new, internationally agreed paradigm, and address not only target species but also others that interact with them. This new paradigm, known as the *ecosystem approach*, calls for a broader perspective, encompassing not only biological matters but also the dimensions of social well-being, the institutional framework, and participatory governance. This new, multidimensional approach is essential for the sustainable management of fisheries resources and in line with the principles of the Code of Conduct for Responsible Fisheries.

Allocating sufficient resources for the sustainable management of fisheries in an opportune manner is essential

An essential element, directly related to the decision-making process for management of the sector, is fisheries research that provides scientific support for conservation and management measures. Fisheries research needs to be strengthened to avoid negative effects, but in many cases it is not prioritized as and when required. Moreover, the institutions responsible for the research often do not enjoy the independence necessary to issue regulatory recommendations objectively and keyed to the sustainability of the resources.

Regulations governing fishing and aquaculture activities should be based on objective, opportune inputs provided by science. This calls for the timely allocation of the material, human and financial resources required. Given the importance that fisheries capital has acquired in LAC, each country should have a national policy for fisheries research, underpinned by a coherent legal framework and a ring-fenced budget.

Promote participatory management and shared responsibility for the sustainable use of fish stocks and aquaculture resources

The countries should involve users and the authorities in shared management and self-regulation, taking into account the economic background, real productive capacity and biological capacity of ecosystems, in order to prevent overuse, illegal capture fishing and underemployment. All available tools should be used to encourage responsible fishing and aquaculture; and all available instruments to combat illegal fishing and discards. Policies devised in a participatory manner with the stakeholders, sharing the best information available and striking the right balance between incentives and social protection schemes that guarantee sufficient income to fisher families, create fishing communities without poverty and sustainable fisheries.

South-South cooperation as a means of closing gaps

Fisheries and aquaculture development in the region is very uneven across countries. Regional cooperation in LAC will undoubtedly be an important stratagem for closing gaps through the horizontal transfer of technology, experiences with public policy for the sector, and human resources training.

It is important to enter into agreements for South-South and triangular cooperation, to stimulate the flow of technology within the region and strengthen links between countries by means of partnerships for the marketing of fisheries-aquaculture products in global markets. In general, advantage should be taken of regional integration mechanisms to promote bilateral or multilateral agreements that promote integration in LAC.

Improve the systems used to record fishery and aquaculture statistics

The sustainable management of fish stocks and aquaculture resources is impossible without timely, accurate sectoral information. A robust system with broad geographic coverage is essential to compile data about the people engaged in the activity and their equipment, and national landings and aquaculture production. It is recommended that tools be developed and improved to facilitate database management, including ecosystem information (i.e., integrated environmental, fisheries and social information).

Encourage fish consumption to boost domestic markets and improve nutrition

In recent years, fish consumption has risen significantly in virtually all countries of the region; however, large segments of the population, the most needy, still have no access to this source of protein. Integrated communication campaigns, distribution strategies and mechanisms should be designed to make fish more affordable, primarily for the most vulnerable populations. In this regard, State purchases, the promotion of short supply chains, and the inclusion of fish in school meals are tools that can stimulate domestic markets and lead to substantial improvements in family nutrition.

Similarly, it is important to promote national aquaculture production, to meet the increase in demand and avoid the need for more imports.

Stimulate innovation

Encouraging innovation, creating an enabling environment to promote new products, processes and techniques, will enhance competitiveness and make it possible to boost local economies and create jobs. Policies should be devised for this purpose, linking the productive and academic sectors, and, where possible, including the creation of specific funds to cover the risks involved in new processes. In some cases, it is feasible for public institutions to carry out technology development projects on certain issues related to fisheries and aquaculture, and then transfer them to the private sector and small producers' organizations.

For research and development (R&D) to take place, qualified human resources and research training institutions are required. Countries in the region must invest more in R&D. In general, countries like Mexico, Cuba, Brazil and Chile invest between 0.5% and 1% of their respective Gross Domestic Product (GDP) in R&D. Argentina, Costa Rica, Bolivia, Uruguay, Panama, Venezuela and Colombia invest between 0.2% and 0.5%. Others, such as Peru, Paraguay, El Salvador, Ecuador, Honduras, Nicaragua and Guatemala, invest less than 0.2% of GDP. In comparison, the OECD member countries (excluding Mexico and Chile), invest 2.3% of GDP in R&D.

Generate and coordinate policies and strategies to help the sector adapt to climate change

One of the biggest challenges facing humankind is climate change. It is therefore imperative to focus efforts on assessments of the vulnerability

of the fisheries and aquaculture sector to phenomena associated with climate change at the local level. These assessments should be used to devise comprehensive (multisectoral) strategies for adaptation to such phenomena at the territorial (local) level. The coordination of sectoral policies at the territorial level is also essential to increase the resilience of communities.

Conclusions

LAC's most important fish stocks are either overexploited or fully exploited, which has resulted in a marked decrease in catches. This problem is compounded by the impact on fishing of climate variability and climate change, and associated phenomena.

Aquaculture remains the most dynamic food producing activity in the world and in LAC. Its growth and expansion will depend on several factors, such as production costs (high costs of key inputs used in feed), the recovery of national economies and the market, and, most importantly, the policies applied in producing countries or those with the biggest growth potential.

The consumption of fisheries products continues to grow in the region, even if much of the supply is provided by imports. Recognizing the importance and potential dynamism of domestic markets in the countries of the region will encourage the expansion of aquaculture. It will be necessary to expand distribution networks and formulate state procurement programs and programs for the inclusion of fish in school meals, to afford the poorest segments of society access to this source of protein.

Institutional frameworks for fisheries and aquaculture that assign the sector greater importance within the organizational structure of governments will provide more resources and a more robust legal framework for the sustainable use of the countries' fishery resources, for the benefit of their inhabitants.

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Chapter 2.5: Forests

Forests

The Latin American and Caribbean (LAC) countries are making major efforts to reduce deforestation, which remains a serious concern in the region. The promotion of sustainable forestry management and agro-environmental policies aimed at integrated natural resource management are reducing pressure on forests and yielding significant benefits for local communities.

Facts

- Deforestation and forest degradation continue to be one of the biggest environmental problems faced by LAC, with serious impacts on biological diversity, climate change mitigation, and water and soil conservation. They also pose a threat to millions of people who depend, directly or indirectly, on forests for their livelihoods.
- The countries of the region, mindful of the importance of the conservation and sustainable management of forests, have devised various policies and programs to reduce deforestation.
- During the period 2010-2015, the rate of deforestation fell to roughly 2.2 million hectares per year, compared with 3.6 million during the previous five years.
- Significant changes in land tenure have taken place in the region. Around 250 million hectares have been allocated to indigenous peoples and other rural communities, leading to a change in the management and administration of forest resources.
- The agro-environmental policies promoted by various countries in the region are generating significant benefits in terms of forest conservation and environmental services.
- Despite these advances, strong support from governments and international organizations is still required for the development and implementation of forest management activities by communities.

Trends

The rate of deforestation is decreasing

The loss of forest cover is one of the most pressing environmental problems facing LAC. According to the most recent study of the issue released by the United Nations Food and Agriculture Organization (FAO), the Global Forest Resources Assessment (FAO, 2010), between 2005 and 2010 the region accounted for over 70% of global deforestation (3.94 million hectares per year). Given the magnitude of the problem and its impact on the livelihoods of rural communities, many countries have undertaken important actions to reduce deforestation and forest degradation, which is reflected in the substantial reduction in the loss of forest cover over the last ten years.

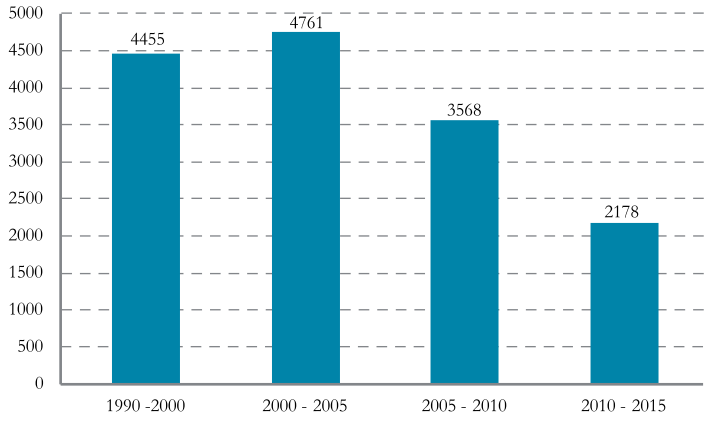
Table 9. Variation in forest cover over the period 2010-2015

Countries/Subregions	Total Forest Area (thousand ha)		Variation (thousand ha)	
	2010	2015	Five-year period	Annual
Mexico	66,498.00	66,040.00	- 458.00	- 91.6
Central America	21,010.39	20,250.30	- 760.09	- 152.02
Caribbean	6745.10	7195.41	450.31	90.06
South America	852,133.18	842,010.62	-10 122.56	- 2024.51
Total Region	946,386.67	935,496.33	-10 890.35	- 2178.07

Source: Taken from country reports for the Global Forest Resources Assessment (FRA) for 2015.

According to recent FAO studies, deforestation in LAC increased significantly during the period 2000-2005 compared to the previous five years, reaching almost 4.8 million hectares per year, and then declined steadily to 3.6 million hectares per year between 2005 and 2010.[25]Although FAO has yet to complete its latest five-year study of deforestation, it is estimated that the amount of forest lost in LAC has fallen significantly, with the annual figure expected to be around 2.18 million hectares (Figure 21).

Figure 21. Rate of deforestation in LAC (thousand ha/yr)



Source: Calculations based on data from country reports for the Global Forest Resources Assessment (FRA) for 2015.

25 In preparing the 2015 Global Forest Resources Assessment (FRA 2015), FAO made more accurate, up-to-date estimates of changes in forest cover in the past. Hence, this figure and the figures in Figure 1 are not the same as those published in the FRA 2010.

This substantial reduction in the loss of forest cover in the region was achieved thanks to the response of the countries, which adopted a series of policies and laws to reduce illegal logging, promote sustainable forest management, restore degraded soils, increase protected areas and legally defined indigenous territories, and create incentives to reduce greenhouse gas (GHG) emissions. It is important to bear in mind that more than two thirds of such emissions in the region stem from activities related to changes in land use or, more specifically, deforestation.

The causes of deforestation remain unchanged

Deforestation in LAC is strongly linked to agricultural and livestock production. A series of public policies, especially those associated with land tenure and the promotion of agricultural activities, continue to drive deforestation (Müller *et al.,* 2014; Bottazzi *et al.,* 2013; Viola, 2013; Godar *et al.,* 2012; Ezzine-de-Blas *et al.,* 2011). These processes of change in land use are clearly favored by a number of factors, including the construction of access roads to areas of natural forest (Godar *et al.,* 2012; Bottazzi *et al.,* 2013).

Some of the most important groups responsible for deforestation are small farmers in search of land to settle, large-scale livestock producers, and farmers who produce soybeans, corn, and other agricultural commodities on large areas of land.

The impact of different types of agricultural activity on forests varies according to the specific situation of each country. Many studies have found that large-scale cattle ranching is the main cause of deforestation in Amazonia (Müller *et al.,* 2014; Armentera and Rodriguez-Erazo, 2014; Bottazzi and Dao, 2013), while smallholder settlements remain one of the chief causes in the Central American countries (Lopez-Carr and Burgdorfer, 2013). Mechanized agriculture is the most important cause of deforestation in Argentina, Bolivia, Brazil and Paraguay (Grau *et al.*, 2005).

In most countries, these processes are driven by a number of other factors, such as institutional and economic issues. Firstly, the lack of property titles, which encourages the occupants of land to seek short-term benefits, thereby fostering deforestation. Economically speaking, soybean and, in particular, meat prices are clearly linked to deforestation in the Amazon region. The profitability of livestock farming is often considered the main cause of deforestation in the Brazilian Amazon (Araujo *et al.*, 2011). Some projections suggest that oil palm could have a significant negative impact on deforestation in Latin America, considering the growing demand for oil and the fact that less land is available for planting in Asia. There are sizable plantations in Brazil, Colombia, Mexico, Peru, Venezuela, and most of the Central American countries.

In South America, the huge increase in soybean cultivation is one of the most important and direct causes of deforestation. Although small-scale agriculture has less of an impact, in some cases it accounts for over 50% of deforestation (Godar *et al.,* 2012). In many countries there are important local immigration patterns that give rise to active processes of deforestation and forest degradation by smallholders establishing new settlements who resort to slash and burn methods. In countries like Bolivia, Brazil and Peru, major deforestation is caused by smallholders or occupiers of agricultural land (Verburg *et al.*, 2011; Godar *et al.,* 2012.). In Argentina, however, deforestation processes are clearly associated with farming on large estates, especially soybean production, which has affected the subtropical lowland rainforest, especially in the Chaco Húmedo region (Grau *et al.,* 2005).

In Central America, on the other hand, subsistence farmers' encroachment into forests has been the main cause of deforestation. Costa Rica's efforts are worthy of mention, with the country having managed to reverse the deforestation process.

Unclear land tenure drives deforestation

Historically, problems related to land tenure have impacted heavily on deforestation. In many countries of the region, especially those with forests in Amazonia, large areas have been occupied illegally and quickly deforested to establish subsistence farming activities. Opinions differ regarding the impact of this activity on total deforestation, but it is clear that it is one of the main causes of the problem. Most studies suggest that smallholders account for 30%-50% of deforestation, although some put the figure much higher (Godar *et al.*, 2012).

The lack of land tenure is one of the factors driving deforestation. Squatters want to make a profit as quickly as possible while engaging in activities that will allow them to secure recognition as owners of the land concerned. In several countries of the region (e.g., Ecuador), legislation actually encouraged deforestation, because the legal allocation of land depended on farmers demonstrating that it had been prepared for production, which in most cases meant clearing it (i.e., deforestation). This practice is evident in the preparation of land for livestock, as farmers with limited financial resources usually resort to burning to clear the land.

In the case of Brazil, much of the land settlement in the Amazon region occurs outside the official settlement areas, on both public and private land that is not being used by the owners. This has been exacerbated by the legislation in place, which permits public land to be occupied for private use. After five years of continuous occupation and use for production, the occupant can apply for ownership rights. The problem with this practice from the point of view of deforestation is that, besides increasing the likelihood of illegal occupation, leaving forest standing is not considered a productive use of the land (Araujo *et al.* 2011).

Various initiatives exist aimed at reducing deforestation and advancing sustainable forest management

Most countries in the region are implementing actions designed to reduce deforestation, as reflected in the latest figures on the state of the world's forests (FAO, 2014). LAC deforestation rates have decreased markedly thanks to the policies being implemented by most countries.

Brazil, for example, is undertaking major efforts to reduce deforestation in the Amazon, which are already yielding good results. The Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAM) is contributing significantly to the reduction of deforestation. The system for monitoring forest cover changes implemented by Brazil's national space research institute (INPE) has contributed to this task, not only for Brazil, but also for other countries in the region and across the world. Ecuador, Paraguay and Peru also have programs for reducing emissions from deforestation and forest degradation (REDD+).

Several countries in the region are implementing programs to advance sustainable forest management and restore degraded ecosystems. One of the most important of these initiatives is the Sustainable Forest Management Programme in the Andean Region, which is being carried out under an agreement between Finland's Ministry of Foreign Affairs and the Inter-American Institute for Cooperation on Agriculture (IICA) in four Andean countries (Bolivia, Colombia, Ecuador and Peru). The project aims to eliminate barriers that restrict the development of the forestry

sector, especially those related to information, financing, the value attached to forest products and services, and the restoration and recovery of degraded areas.

During the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) held in Lima, eight Latin American countries launched an ambitious joint initiative aimed at restoring 20 million hectares of degraded land by 2020 by means of forestry, agroforestry and agricultural activities. The countries participating in this initiative are Argentina, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Mexico and Peru.

Outlook

International climate agreements will have a significant impact in reducing deforestation

Both the authorities and civil society in the countries of the region are more aware of the importance of forests, especially in terms of climate change mitigation, and this has translated into programs, policies and legislation aimed at reducing deforestation and degradation.

The latest figures, which are being prepared by FAO, indicate that countries in the region are making significant efforts to reduce deforestation through new policies and legislation. Undoubtedly, one of the main policies being used to achieve that objective is the reduction of GHG emissions, especially since nearly two thirds of those emissions are related to deforestation and forest degradation. The agreements that have been reached under the UNFCCC attach great importance to the REDD+, as it is considered one of the most cost-effective ways to mitigate climate change. It is expected that in the years ahead a large proportion of the mitigation efforts of countries in the region will have to do with the control of deforestation, particularly as it is an element that has little to do with economic growth (Viola, 2013). The Convention expects to mobilize hundreds of billions of US dollars in the coming years, especially from 2020 onwards. A large slice of these resources should be channeled through REDD+ programs, to generate an additional, growing reduction in deforestation rates and, as a result, new income for forest owners.

However, it is very unlikely that small forest owners or occupiers, who, as has been noted, are part of the deforestation problem in several countries of the region, will be able to benefit from this mechanism (Ezzine-de-Blas *et al.*, 2011; Lamb *et al.*, 2014). Therefore, countries should seek other alternatives to reduce rates of deforestation caused by small farmers, especially in the case of farmers who are occupying land illegally. Implementing policies to support family farming, in order to increase productivity and thereby reduce pressure on forests, is critical. (Ezzine-de-Blas *et al.*, 2011; Godar *et al.*, 2012.).

At the COP to the UNFCCC held in Warsaw in November 2013, Decision 1/CP.19 was adopted, in which the Parties were invited to initiate domestic preparations for their intended nationally determined contributions (INDCs) to be submitted to the Convention Secretariat before the COP that is due to be held in Paris in December 2015. At that meeting, the countries are expected to adopt a protocol, other legal instrument or legally agreement binding upon all parties aimed at achieving a significant reduction in GHG emissions (Objective #2 of the Convention). Many countries in the region will undoubtedly include reducing deforestation as a major element of their INDCs. Mexico, the first country in the region to submit its INDCs, included the reduction of deforestation in its contribution.

Box 9. Examples of agro-environmental policies in Brazil

In the case of Brazil, the most important agro-environmental policies include those aimed at technical assistance and rural extension, although there are others geared to the generation of environmental services, such as water production. The "Water Producer" program is designed to combat the pollution of strategically important watersheds by conserving or restoring vegetation in relevant areas. Another agro-environmental policy in Brazil is the so-called Sectoral plan for climate change mitigation and adaptation for the consolidation of a low-carbon emission economy in agriculture (ABC Plan). In December 2010, through Decree No. 7390, the ABC Plan was instituted to promote the reduction of GHG emissions in agriculture by making more efficient use of natural resources, increasing the resilience of production systems and rural communities, and facilitating the adaptation of agriculture to climate change. The ABC Plan includes various programs, including the integration of forestry, crop farming and livestock, whose goal is four million additional hectares, and commercial forestry with a target of three million additional hectares as part of the Plan. The Programa Bolsa Verde is another agro-environmental tool designed to encourage families living in extreme poverty, fostering ecosystem conservation and improving the living conditions of the target population through training in various fields, including environmental matters.

Source: Brazil Cooperation Programme (FAO, 2014).

Regulation of land tenure continues to be an important factor in the improvement of forest management

Another important factor in reducing deforestation is land tenure. Over the last 30 years, forest ownership in Latin America has changed dramatically. In many countries of the region, especially those in which forests are predominately tropical, significant areas of land have been allocated to indigenous communities. By 2008, more than 250 million hectares of (predominantly forested) land had been legally assigned to indigenous communities, local communities and smallholders (Del Gatto, 2014). Peru has almost 16 million hectares of community forests (Cossio *et al.*, 2014.); in Brazil, over 145 million hectares have been legally transferred or designated for use by communities or small landowners, 110 million of which belong to indigenous communities; and in Bolivia, transfers under the system of *Tierras Comunitarias de Origen* (autonomous and communally owned indigenous land) had reached 22.5 million hectares by 2012, including nearly 13 million hectares of forest (Del Gatto, 2014). In the case of Brazil, it is important to note that not only has ownership of the land and its forests been transferred, but also the rights to ecosystem services generated by forests. This change in forest ownership is leading to an increase in community forestry, which should be strengthened with international support and national policies, and through partnerships and alliances with private organizations. Small farms should continue to produce much of the timber extracted from the Amazon region (Molnar *et al.*, 2008, cited by Del Gatto, 2014).

Agro-environmental policies should continue to have a positive effect on social development and the conservation of forest resources

Many countries in the region are developing agro-environmental policies and legislation, which should lead to the incorporation of environmental planning processes that integrate agriculture with other productive and conservation activities, with a territorial

Box 10. Community forest management in Bolivia

The forestry sector in Bolivia is one of the most important non-traditional production sectors, despite facing significant challenges that limit its productive, economic and social potential. Over the last decade, forest management in Bolivia has been improved by means of significant reforms to forest governance, which has changed the makeup of the key actors in the subsector. The new actors, mostly indigenous communities, face a number of socio-economic problems as a result of their limited technical and administrative capabilities and difficulty in accessing financial resources. In this context, the success of community forest management depends on the inclusion of these new actors and the strengthening of their capacity to manage Bolivia's forests.

The concept of community forestry has been gaining strength since the early 1990s and receiving more support, reflected in a considerable increase in projects and actions designed to promote it. This new type of management has been recognized as very promising, combining sustainable forest management with a fairer and more equitable distribution of benefits and a greater and more active participation, which should impact positively on poverty reduction. Community forestry appears as the means to reconcile conservation and development. In recent years, additional benefits include carbon sequestration, climate change mitigation, and the conservation of biodiversity.

Although several countries, including Bolivia, have made significant progress with community forestry, evidence exists of the problems facing this mode of operation, such as the lack of technical expertise of the actors involved, difficulties in accessing financial resources, and institutional weaknesses. Moreover, the income generated by the activity is usually not sufficient to make sustainable forest management competitive with other land uses, or attractive to investors.

The changes in forest governance that Bolivia is implementing are designed to solve those problems, creating an enabling environment for the implementation of community forestry. Reforms in land tenure and administrative decentralization processes are creating the conditions required for the emergence, or rather the legalization, of new actors in the forestry sector, mainly indigenous communities. To secure land tenure and better access to financial resources, communities can make forestry an effective tool for poverty reduction.

The reforms are reflected in the figures. In 1997, 87 legal forest users controlled nearly 5.6 million hectares of forest; by 2008, there were 24,300 controlling more than 9 million hectares, with 2300 approved management plans.

Source: Benavides *et al.* 2014.

(local) land management approach. These policies should help strengthen family farming and traditional peoples and communities, and generate a series of environmental co-benefits, including the conservation of forest resources. In this regard, an important contribution is being made by the project *Strengthening agro-environmental policies in LAC through dialogue and exchange of national experiences*, which FAO is implementing with support from Brazil and in which five countries of the region are involved.[26] The project has shown that it is possible to combine agriculture and natural resource conservation actions (see Box 9). Mexico has made solid progress with institutional efforts to include environmental issues in public policy and day-to-day work with rural dwellers. The most important components of the Mexican program include the conservation and sustainable use of soil and water, the modernization of traditional agriculture, efforts to deal with natural disasters, and the establishment of biological corridors (GCP/RLA/195/BRA Project).

26 Brazil, Chile, Colombia, Mexico, and Nicaragua.

Community forestry can contribute to the conservation of forest resources

Agricultural and forestry activities carried out by rural communities are becoming more important in many countries of the region, resulting in lower rates of deforestation and progress towards sustainable forest resource management.

There are many examples of community forestry activities in the region. Mexico and the Central American countries have a long history of community forestry. In Honduras alone, there are more than 230 agroforestry cooperatives, involving more than 9000 people. In the South American countries, community forestry is gaining importance and becoming one of the main livelihoods of

Box 11. Cooperativa Mixta del Bosque Nacional Tapajós, Pará, Brazil (COOMFLONA)

COOMFLONA is a cooperative of indigenous and traditional peoples living in the Tapajós forest. The cooperative's origins are closely related to the creation of the national forest, as it was formed when local communities got organized in order to resist efforts to relocate them outside the protected area. Twenty-five years later (in 2000), the alliances developed and political pressure applied by the community resulted in the creation of the national forest and recognition of the community's right to continue living in the forest. During the long struggle for their rights, the community generated a network of relationships that now permits them to act collectively and take decisions as a group.

Another development that helped consolidate the cooperative was the conflict that arose in the late 1990s, when the Brazilian Institute for Environment and Renewable Resources (IBAMA) granted a private company rights to harvest 5000 hectares, at a time when the community's use of the forest was severely restricted. The company tried to placate the local communities by offering work to some of their members. However, the reaction was so strong that IBAMA did not renew the concession. In 2013, the community secured the rights to the management of the forest, thanks not only to the fact that some community members had been trained in logging, but also to investments in roads and productive infrastructure by the company and the government years before. The cooperative has 212 members and is managed by a board of directors.

Over the years, COOMFLONA has developed the capacity to produce timber on an industrial scale. In 2013, it harvested 22,000 cubic meters of timber from around 1000 hectares of forest, employing 136 people, 64 of whom were involved in the harvesting work. Most workers belong to local communities, making the cooperative the main source of employment in the area.

The cooperative now manages 32,418 hectares of forest land, 9000 of which are certified by the Forest Stewardship Council (FSC) in Brazil. The scale of its activities and the per-hectare logging rate do not pose a threat to the sustainability of the resources of the Tapajós forest. In 2013, the cooperative had revenues of almost USD 7.8 million, and made a profit of USD 1.1 million.

It is important to note that this initiative has been successful because IBAMA granted the community ownership of the timber, and it receives technical assistance from the government and private organizations in forest management and timber marketing. Also worth mentioning is the fact that, thanks to the road and river systems that exist in the national forest, the community has no difficulty transporting the timber produced.

COOMFLONA plans to sell only own sawn timber in the future, which will call for significant investment in the construction of a sawmill.

Source: Del Gatto 2014.

local communities located within forests. It is also becoming a key element in efforts to mitigate climate change, with better care of forests leading to a reduction in GHG emissions (Gaviria and Sabogal, 2013).

Evidence gathered in recent years demonstrates that, with the necessary technical support and the use of incentives, community forestry has enormous potential to produce economic and social benefits for local communities, income from the sale of timber, new sources of employment, and stronger organizations. It also has a clear impact on reducing deforestation and forest degradation, which can yield additional benefits as part of the efforts to reduce GHG emissions that most of the countries are undertaking.

As deforestation and forest degradation account for a large proportion of such emissions in the countries of the region, the benefits of community forest management should be boosted from 2020 onwards when countries begin implementing the INDCs they are required to submit to the UNFCCC Secretariat before the COP scheduled to be held in Paris in December 2015. The INDCs of most countries are likely to include the reduction of deforestation and forest degradation, and an increase in carbon stocks through afforestation and reforestation.

Policy recommendations

Countries should review policies, instruments and legislation that encourage deforestation

Most countries in the region have policies, and even laws, that promote deforestation in some way. The most obvious example are the policies used to allocate land, whose objective is usually to incorporate new land into livestock or crop production, so deforestation occurs as a matter of course. Forest conservation, even if some degree of management is involved, is not considered sufficient to demonstrate that the land is actually being used, and ownership is denied as a result.

Public works, particularly the construction of access roads, can have a strong impact on deforestation rates. Countries should anticipate the potential effects and make provision for mitigation measures before such works are carried out.

There are a number of agricultural policies that can have a marked, if less direct, impact on deforestation rates. One that is recommended is the development of agro-environmental policies with a broad approach that generate synergies between agriculture and conservation of natural resources.

Countries should continue their efforts to regularize land tenure, especially for communities located within forests

Land tenure is an issue that is often addressed by organizations related to agriculture and forestry in LAC because of the very considerable economic and social impact of such activities; it also plays a key role in rural development in the region. Equally, forms of use and land ownership can have a significant impact on the conservation of forest resources.

Although the countries of the region have made progress in regularizing land tenure, with special consideration for local communities, it remains one of the main causes of deforestation and forest degradation. Efforts to organize land allocation processes need to continue, therefore.

In addition to efforts to legalize ownership, countries should seek to increase productivity with policies in support of small farmers. If they produce more on the same land, and have incentives for conservation, there will less pressure on forests.

Countries in the region should strengthen their policies related to community forestry

Despite the growing importance of community forest management, and given the amount of forest land owned by local (mainly indigenous) communities, the supporting institutional framework is still very weak. Most of the community organizations involved lack the technical and financial capacity to organize their productive activities and the marketing of their products, so they rely on the help of local organizations, governments and international organizations. In many instances, the local organizations and governments concerned are unable to meet the communities' requests for support and technical assistance.

Countries should step up their efforts to help community organizations shake off the influence of logging companies or intermediaries, which still exert strong pressure on community producers and small, independent forest producers. It is critical for countries to boost the generation of the capabilities necessary to make progress with this mode of development, through knowledge and technology transfer and mechanisms for mobilizing financial resources and accessing markets competitively. The countries should also strengthen the capacity of the national and local organizations responsible for supporting and supervising community forestry management activities.

Create the conditions for the implementation of REDD+ programs, with the active participation of local communities

The implementation of REDD+ programs under the UNFCCC can bring about a significant change in the management and conservation of forest resources in the region, as they have the potential to link developed countries prepared to mobilize major resources for climate change mitigation with communities that live within forests. The conservation of forests as a mitigation tool can yield significant benefits for local communities, particularly indigenous peoples.

To take advantage of this opportunity, countries need to strengthen their institutions; improve the quality and flow of information; strengthen their measurement, reporting and verification (MRV) capabilities; and, in particular, develop mechanisms to ensure that the benefits generated by the REDD+ system are distributed fairly among all the parties involved. It goes without saying that the communities themselves should be heavily involved in the planning, implementation and monitoring of REDD+ programs.

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Chapter 3: Rural well-being

Rural well-being
Perspectives on youth, gender and inequality in the rural milieu

Introduction

This analysis is based on a household classification designed to identify patterns of employment, utilizing household surveys. The classification identifies six mutually exclusive types of household, covering the range of productive activities in which they engage. The categories, defined according to the chief occupation of household heads, are:[27],[28] 1) salaried agricultural households (the main occupation of the household head is that of a wage-earning agricultural worker); 2) salaried non-agricultural households (the principal occupation of the household head is that of a wage-earning non-agricultural worker); 3) employer households (household heads employ others, either in agricultural or non-agricultural activities); 4) own-account agricultural households (the chief occupation of the household head is that of an own-account agricultural worker); 5) own account non-agricultural households (the main occupation of the household head is that of an own-account non-agricultural worker); and, 6) inactive households, meaning household heads are not part of the labor force, either because they are inactive or because they are unemployed.

As the classification suggests, we take the household as the primary unit of analysis. In doing so, we make the following assumptions: 1) the household is the relevant economic unit in which employment decisions are made; 2) the structure of employment within a household is representative of its productive orientation, so that changes within a household are indicative of the structural changes that take place within the economy as a whole. To conduct the analyses, we utilize data from household surveys administered in 12 Latin American and Caribbean (LAC) countries[29] in circa 2000 and circa 2012.

The document highlights three implications for policies:

- Supporting skills acquisition of households transitioning from agricultural to non-agricultural employment, especially salaried employment;
- Encouraging diversification of the rural economy, both in agricultural and non-agricultural activities;
- Guaranteeing a good macroeconomic environment to ensure the resources required for the continuity of social programs that have helped to reduce rural poverty and income inequality.

27 The agricultural sector includes activities related to crop production, livestock, fisheries and aquaculture, and forestry production. The non-agricultural sector includes economic activities outside of these four areas.

28 The typology used in the previous report combined the household head's primary occupation with information about the occupations of other working members of the household, and defined eight types of households: (a) salaried agricultural; b) salaried non-agricultural; c) diversified salaried; d) employers; e) own-account non-agricultural; f) 100% family agricultural; g) diversified family agricultural; and, h) inactive). The new typology categorizes households solely on the basis of the occupation of the household head, allowing for a more concise categorization and avoiding classification ambiguities that arise when other household members are divided into multiple employment categories.

29 The countries included and years surveyed are as follows: Bolivia (2002 and 2009), Brazil (2001 and 2012), Chile (2000 and 2011), Colombia (2002 and 2012), Costa Rica (2002 and 2012), Dominican Republic (2002 and 2012), El Salvador (2001 and 2012), Honduras (2002 and 2010), Mexico (2000 and 2012), Nicaragua (2001 and 2009), Panama (2002 and 2011), and Paraguay (2000 and 2011).

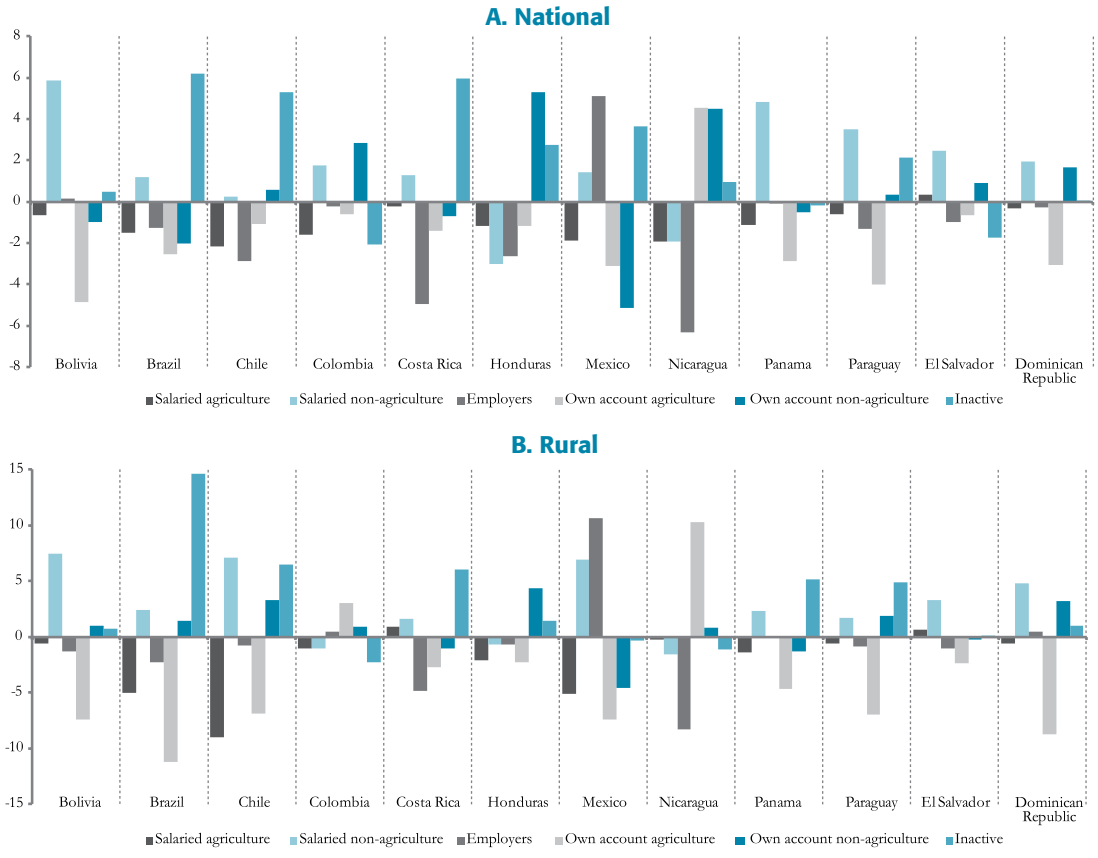
Trends

The share of households engaged in agriculture has shrunk, while the share engaged in non-agricultural activities continues to expand

Figure 22A depicts changes in the distribution of each country's total household population across the different employment categories, circa 2000 and circa 2012 (the share of households in each employment category and year are provided in Table A1 of the Appendix). For nearly every country included in the sample, the salaried and own-account agricultural sectors shrank by an average of between 1% and 2% (the exceptions are El Salvador and Nicaragua). This trend is consistent with that of the previous two decades, where the share of the population engaged in agriculture fell steadily (Muchnik, Morales, and Vargas, 1997; Gindling and Newhouse, 2014). Countries in the region are continuing along their trajectory of transitioning from agrarian to non-agrarian economies (Gindling and Newhouse, 2014).

Further, Figure 22A shows that, in consequence, during the same period countries experienced an increase in the share of households engaged in salaried non-agricultural activities. On average, the salaried non-agricultural sector in LAC expanded by approximately 2.5% between 2000 and 2012.

Figure 22. Latin America (12 countries): Changes to relative household distribution (national and rural), circa 2000 and circa 2012



Source: Agricultural Unit, ECLAC, calculated from household surveys.

Bolivia saw the biggest expansion (nearly 6%), while Chile experienced the smallest increase (0.25 percentage points).[30-31] Additionally, those countries that did not see a rise in the salaried non-agricultural sector (Honduras and Nicaragua) *did* experience an average increase in self-employed (own-account) non-agriculture of nearly 5%. Thus, it is clear that, over the last decade, the non-agricultural sector as a whole has grown throughout the Latin American region. This is consistent with the literature, which has documented an increase in rural nonfarm employment (RNFE) in Latin American countries (Reardon, Berdegué and Escobar 2001; Cliche 2011; Dirven 2011). This suggests countries can aid the transition of households from agriculture to non-agriculture by investing in retraining and education programs.

However, the non-agricultural sector (salaried or otherwise) did not fully absorb the households that left agriculture. Indeed, Figure 22A indicates that in most countries (80%), the share of households categorized as inactive also increased by an average of three percentage points. This implies that although households may have left the agricultural sector, they were not immediately able to find work in the non-agricultural sector. This may reflect a dearth of jobs in the non-agricultural sector. On the other hand, and given the growth of non-agriculture throughout the region, the increase in the number of households marked as inactive may instead reflect a transition period, during which households leaving agriculture (voluntarily or involuntarily) need time to change their skill set to find meaningful employment in the non-agricultural sector. The trends observed in the rural regions (Figure 22B) mirror those at the national level. Since agriculture is mainly a rural activity, it is no surprise that trends are more volatile in rural areas, as the share of the population likely to leave agriculture is much higher.

Box 12. Own-account non-agriculture in Honduras and Nicaragua

The expansion of the non-agricultural self-employment sector in Honduras and Nicaragua depicted in Figure 22 likely reflects the different developmental experiences of these countries compared with the rest of the Latin American region. They are small, geographically and demographically, and in the 1990s both countries faced much higher rates of poverty than other LAC nations (Corral and Reardon, 2001; Ruben and van de Berg, 2001; WTO, 2010).

In Honduras, Ruben and van den Berg (2001) and Isgut (2004) found that non-agricultural self-employment activities were not related to farm size nor educational attainment, but rather the region of residence. The southern region, with its access to retail markets, has incentivized women to engage in own-account non-agricultural activities, despite having limited access to formal credit markets.

In Nicaragua, tourism may be driving the increase in non-agricultural self-employment. While the rest of Central America experienced depressed rates of tourism during the recession, Nicaragua bucked the trend, posting a 9% increase (UNWTO, 2010). Further, the Nicaraguan inactive sector did not commensurately expand with the shrinking of salaried agriculture, supporting the idea that the non-agricultural own-account sector was able to absorb the excess supply of households, even if salaried non-agriculture could not. This is consistent with trend that increases in non-agricultural self-employment have been independent of farm size (industries supporting tourism need not rely on land holdings), and have been located outside the capital Managua (Corral and Reardon, 2001; UNWTO, 2010).

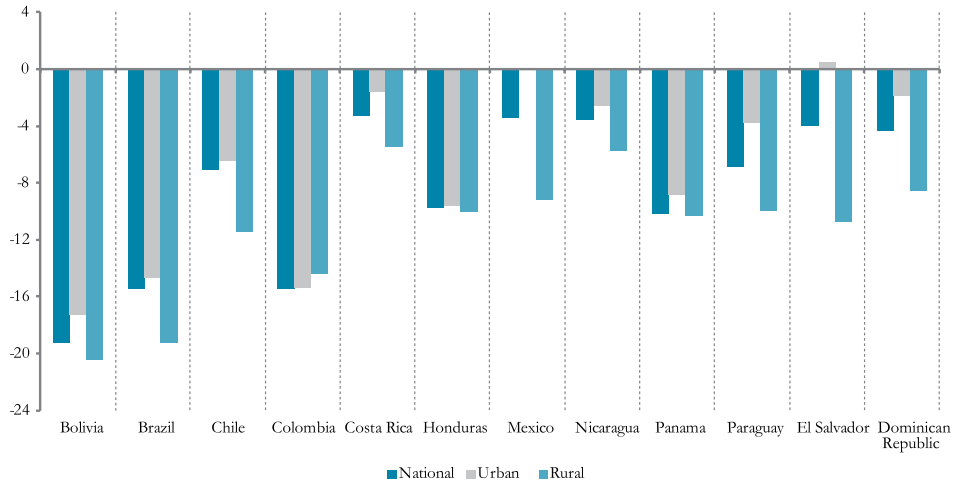
30 We calculate raw averages from weighted household shares.
31 As a point of reference, this equates to approximately 350,000 additional salaried non-agricultural households in Bolivia and 480,000 households in Chile.

Although poverty reduction accompanied the growth of the non-agricultural sector, the main driving force may be related to expansionary social policies

Without exception, the LAC countries experienced a sharp decrease in national, urban, and rural household poverty rates between 2000 and 2012, as depicted by Figure 23[32] (see Table A2, in the Appendix, for detailed information). On average, countries recorded an 8.5% reduction in national poverty. Bolivia experienced the steepest decline (nearly 20%, approximately 115,000 households), while Costa Rica experienced a more modest decrease of three percentage points.[33] In the cases of Brazil and Chile, the poverty rate was halved. Generally, these trends were driven by reductions in rural poverty rates, although many countries, such as Bolivia, Brazil, Colombia, Honduras, and Panama, also experienced steep declines in the urban poverty rate.

The downward trend in poverty rates depicted in Figure 23 could be related to the expansion of non-agricultural employment. That is, as LAC economies continue to diversify, they experience reductions in poverty, a phenomenon observed across the globe (ILO, 2011; OECD, 2010; USAID, 2008). However, although the non-agricultural sector increased its demand for labor in recent years, this trend is not likely to be the main driver for poverty reduction in the region. One reason is that, as discussed above, the inactive sector also expanded during this time; these households will have had limited or no income, abating any decreases in the poverty rate stemming from increased non-agricultural employment. Second, the non-agricultural sector is often dichotomous, ranging from very productive (and profitable) businesses to subsistence activities (Dirven, 2011; Lanjouw and Lanjouw, 2001; Haggblade, Hazell and Reardon, 2010). Thus, households may be both pulled from, or pushed into poverty, during their transition to non-agriculture. In the next section, which

Figure 23. Latin America (12 countries): Changes in national, urban, and rural household poverty rates, between circa 2000 and circa 2012



Source: Agricultural Unit, ECLAC, calculated from household surveys.

32 A household is defined as poor when per capita household income is at or below the specified poverty line, which is usually determined by the value of a specific consumption basket.

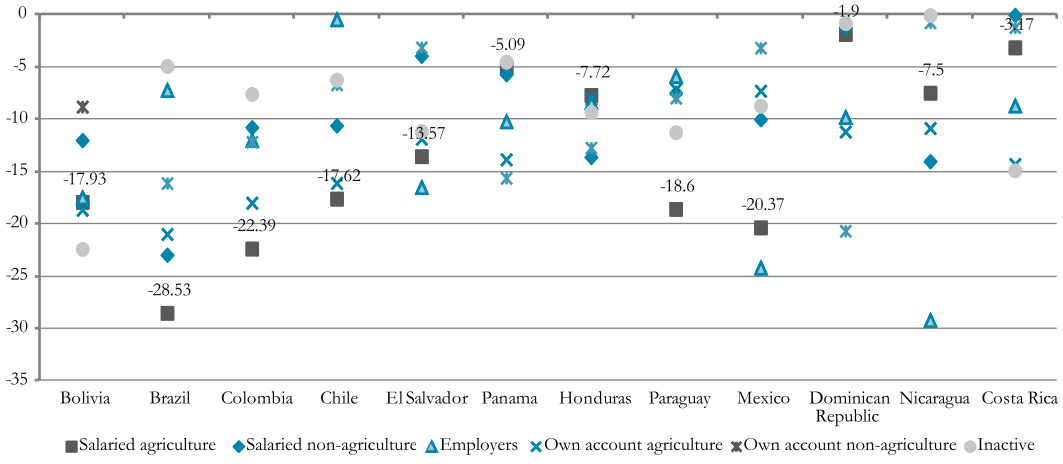
33 In Costa Rica, the absolute number of households categorized as poor actually increased by nearly 21,000. However, the total number of households in the country also increased, resulting in a reduction in the poverty rate.

discusses regional income inequality, this issue is examined in more detail.

More likely the reductions in poverty were driven by recent social policies (ECLAC, 2010, 2013, 2014). Prior to and during the financial crisis, many countries implemented or expanded social programs, which included conditional cash transfers (e.g., Bolsa Verde, Brazil; Mi Familia Progresa, Guatemala), training programs or extensions of unemployment benefits (e.g., Ingreso para la Prosperidad Social, Colombia; Progresando con Solidaridad, Dominican Republic), and relaxing the requirements for pension eligibility (e.g., Colombia Mayor, Colombia).[34] These programs provided a social safety net, supporting beneficiaries when they considered leaving agriculture. Recent analyses have attributed the achievements in poverty reduction to the long-running and far-reaching social policies in place throughout the region (Tsounta and Osueke, 2014; Cornia 2012; Soares *et al.*, 2009). The policy chapter of this publication provides a more detailed analysis of equity policies in rural areas.

Figure 24 shows that the rural salaried agricultural sector experienced the greatest declines in household poverty rates, an average of 13%, compared to the other household employment categories. Countries that did not experience severe poverty reductions in salaried agriculture usually recorded relatively large poverty declines in the own-account agricultural sector, as observed in Panama, the Dominican Republic, Nicaragua, and Costa Rica, thus contributing to the steady decline in regional rural poverty presented in Figure 23. In contrast, the poverty reduction in the salaried non-agricultural sector was only two-thirds as great, approximately 9%. Further, the poverty decline in the inactive sector was also a relatively modest 8.5%.

Figure 24. Latin America (12 countries): Rural poverty reduction by household employment category, between circa 2000 and circa 2012



Source: Agricultural Unit, ECLAC, calculated from household surveys.
Note: Countries are ordered (roughly) according to the magnitude of the decline in national household poverty

34 Detail information about the programs can be found on the website of the Economic Commission for Latin America and the Caribbean (ECLAC).

These trends depict a consistent picture: as at-risk households leave agriculture, the households remaining in the sector become relatively less poor, resulting in large reductions in the poverty rate. These formerly agricultural households then transition to other employment sectors, likely undermining poverty declines in those areas. Thus, the non-agricultural sector, despite expanding and having generally higher levels of income than agriculture, experienced much more modest declines in poverty in the countries of the region between 2000 and 2012 (Gordon and Craig, 2001; Egyei and Adzovor, 2013; Cliché, 2011; Dirven, 2011).

The trends described raise the question of why households are leaving agriculture. While further research is required, three possible reasons are: a) younger skilled workers are facing a dearth of productive employment opportunities (e.g., the case of a young labour force); b) skill mismatch or outdated skills due to technological advancements in agriculture (e.g., the case of an older labour force); and c) older household heads aging out of agriculture.

Perspectives on inequality

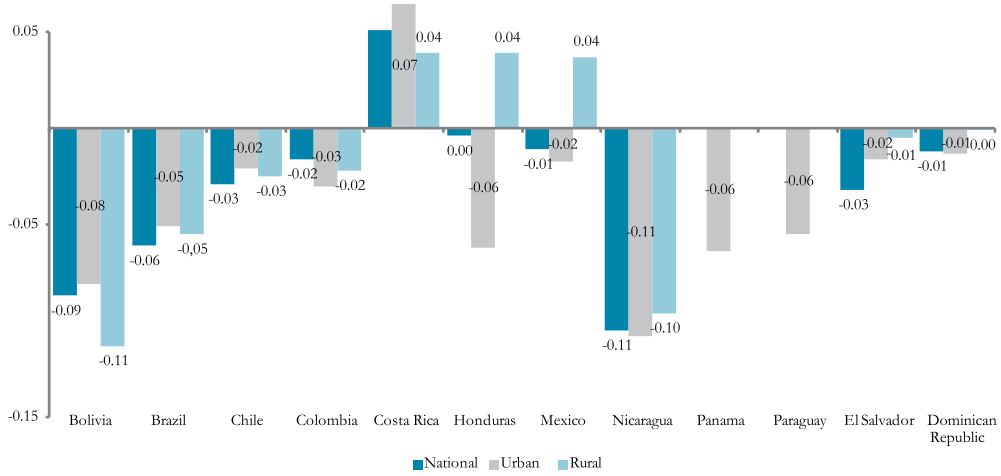
Income inequality decreased during the 2000-2012 period

During the first decade of this century, Latin American countries achieved greater income parity in addition to their achievements in poverty reduction. This is striking, as it indicates that the region successfully raised households out of poverty and that those households gained relatively more wealth than those at the top of the income distribution. Figure 25 shows that nearly all countries observed a decrease in the standard measure of income inequality, the Gini coefficient. Higher values of the Gini indicate greater inequality, as more wealth is concentrated within a small number of households. Circa 1996, the LAC region had a Gini of 0.55, which decreased by .03 points by 2009. The (national) Gini fell most sharply in Bolivia, Brazil, and Nicaragua (by an average of around 8%), while in Honduras and Mexico, it remained nearly the same. Overall, the rural and urban Gini coefficients follow the national trends (with the exceptions of Honduras and Mexico, which are discussed in Box 13).

To understand the dynamics of the tails of income distribution, which drive income inequality, we turn to the Palma ratio (Figure 26). The Palma is the ratio between the amount of wealth owned by the top 10% and bottom 40% of the income distribution. A larger value indicates that very few households capture most of the income. This measure was developed by Cobham and Sumner (2013) and improves on the Gini in two crucial ways. First, unlike the Gini, the Palma is not sensitive to changes in the middle of the income distribution but does respond to changes in the wealth distribution between those in the top 10% and the bottom 40%. Second, the Palma ratio is much easier to understand than the Gini. A change from 2 to 3 in the Palma indicates that the richest 10 percent went from being twice as wealthy to being three times as wealthy as the bottom 40%. A change in the Gini from 0.2 to 0.3 is more difficult to quantify beyond an increase in income inequality.

As Figure 26 shows, the Palma ratio tracks the Gini coefficient closely; at the national, urban, and rural levels, it fell in most countries in the region. Bolivia, Brazil, and Nicaragua, which had the sharpest decreases in the Gini, also recorded the biggest reductions in the Palma. This indicates that decreased income inequality observed in Figure 25 is actually reflecting a compression of the income distribution that stems from the right-hand side (high incomes); in other words, there are fewer households with extremely high levels of wealth.

Figure 25. Latin America (12 countries): Changes in national, urban, and rural Gini coefficients, (1996/1997-2008/2009)



Fuente: Agricultural Unit, ECLAC, calculated from CEPALSTAT.
Notes: The data for Nicaragua is from 1998 (and 2009) and for the Dominican Republic from 2004 (and 2009). Panama and Paraguay have only urban Gini coefficients.

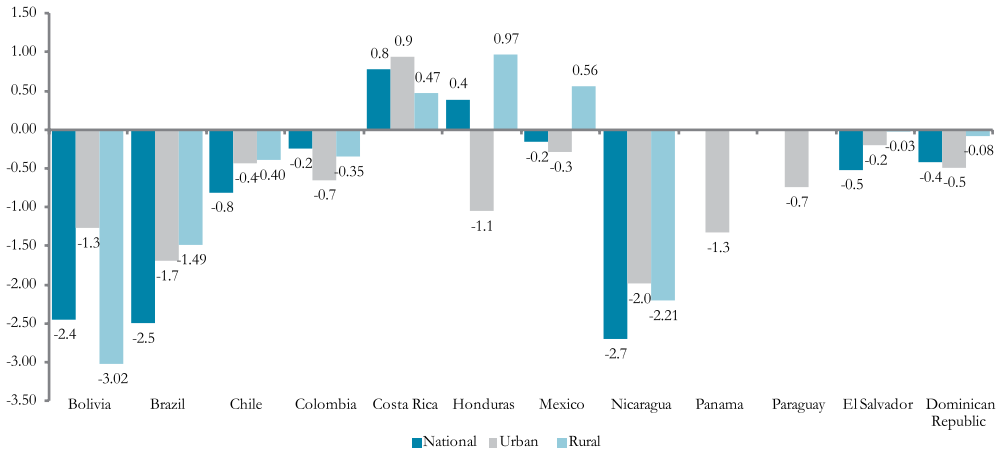
Box 13. Income inequality in Mexico and Honduras

From Figures 25 and 26, it is clear than income inequality has risen in Mexico and Honduras. However, these trends can be attributed to very different causes.

In Mexico, although urban poverty rates stagnated between 2000 and 2012 (see Figure 23 and Box 13), it is rural inequality that increased over time, seemingly counterintuitive as Mexico's social programs targeted the rural population. Esquivel and Cruces (2011) undertook a Gini decomposition exercise to shed light on this puzzle. They found that transfers had reduced rural poverty, thus narrowing the urban-rural income gap and national income inequality. Further, labor income was the largest share of total income throughout Mexico. Thus, as wages became more dispersed in rural areas, inequality increased, and a compressed urban wage distribution resulted in lower inequality in metropolitan regions.

Klasen et al. (2012) attributed the increased rural income inequality in Honduras to greater rural income dispersion. Agricultural wages decreased, while wages in the non-tradable sector grew. This is consistent with the expansion of the non-agricultural sector presented in Figure 22. However, high occupational segmentation and low educational attainment impeded labor mobility, resulting in greater rural inequality.

Figure 26. Latin America (12 countries): Changes in national, urban, and rural Palma ratios (1996/1997-2008/2009)



Source: Agricultural Unit, ECLAC, calculated from CEPALSTAT.
Notes: The data for Nicaragua is from 1998 (and 2009) and for the Dominican Republic from 2004 (and 2009). Panama and Paraguay have only urban Palma ratios.

Combined, Figures 25 and 26 indicate that the decrease in poverty observed throughout Latin America was accompanied by a significant decline in income inequality; there was a shift of wealth from high-earning to low-earning households.[35] This is likely due to the number and scale of social programs implemented in the region over the last twenty years, rather than the expansion of non-agriculture. Because of the subsistence-productive duality of the (own-account) non-agricultural economy, increases in this sector do not directly lead to reduced income inequality.[36] Further Tsounta and Osueke (2014), attribute half of the decrease in regional income inequality to the expansion of social policies, and only one-eighth of the decrease to economic growth and development.[37]

35 This is consistent with Gasparini et al. (2011), a cross-country study of income inequality from 1990-2006.

36 In fact, many studies have theoretically posited and empirically confirmed that in developing and transition economies, the relationship between the size of the non-agricultural sector and per capita income is often U-shaped (Haggblade et al. 2010; Lanjouw and Sariff 2004; Lanjouw and Lanjouw 2001).

37 Recent data on agricultural productivity by Fuglie (2015) also suggests that countries with better productivity performance did better in terms of poverty and income inequality reduction.

Perspectives on gender in rural areas

Rural women headship has increased, possibly due to an increase in labor market opportunities in the non-agricultural sector

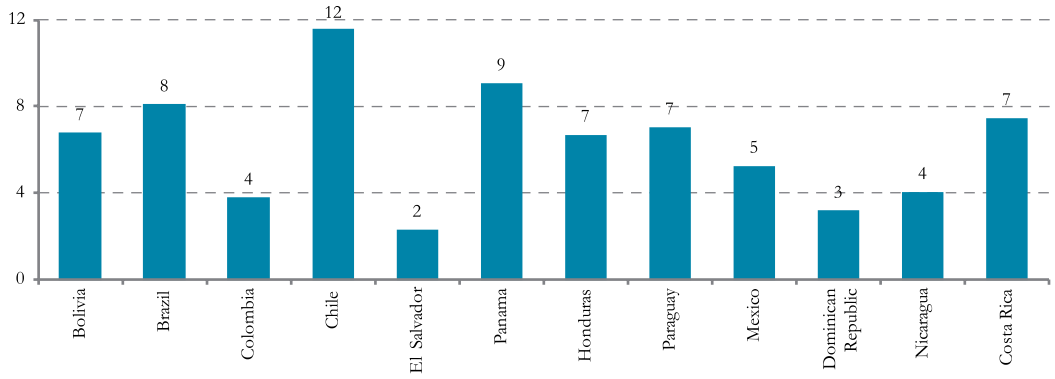
In the Latin American countries included in the analysis, the rate of female headship amongst rural households increased by an average of more than 6% between 2000 and 2012. As Figure 27 depicts, there was a significant amount of variation in this trend across the region during the period in question: Chile experienced an increase in the rate of rural female headship nearly double the regional average (12%), while the increase in El Salvador was only 2%. Nonetheless, it is clear that in rural Latin America there are many more households headed by women now than ever before.

In Figure 27, the countries are listed in order of the biggest decrease in the rural poverty rate to the smallest, between 2000 and 2012. Although

there is a marked increase in female headship in rural areas, this trend is independent of the trend in rural poverty reduction. This independence is encouraging for two reasons. First, we can infer that female headed households were not overly represented amongst poor households; otherwise they would have faced relatively higher reductions in poverty compared to male headed households. Further, as there is no clear correlation between the rate of female headship and poverty rates, we can also conclude that achievements in poverty reduction were spread evenly across female and male headed households.[38] As such, it is possible to rule out poverty reduction as a driver of the increase in the rate of female headship.

Further, female heads of rural households are younger than in previous years. Table A5 (in the Appendix) shows there has been a marked increase in the share of rural female household heads younger than 35. As a result, the average household head age in this group fell by more than one year during the period 2000-2012. Thus, we see that increasingly, younger women in rural Latin America are heading their own households, which is in stark contrast to the national trend for all household heads (see Figure 31).

Figure 27. Latin America (12 countries): Increase in rural female headship rates (circa 2012-2000) in percentage points

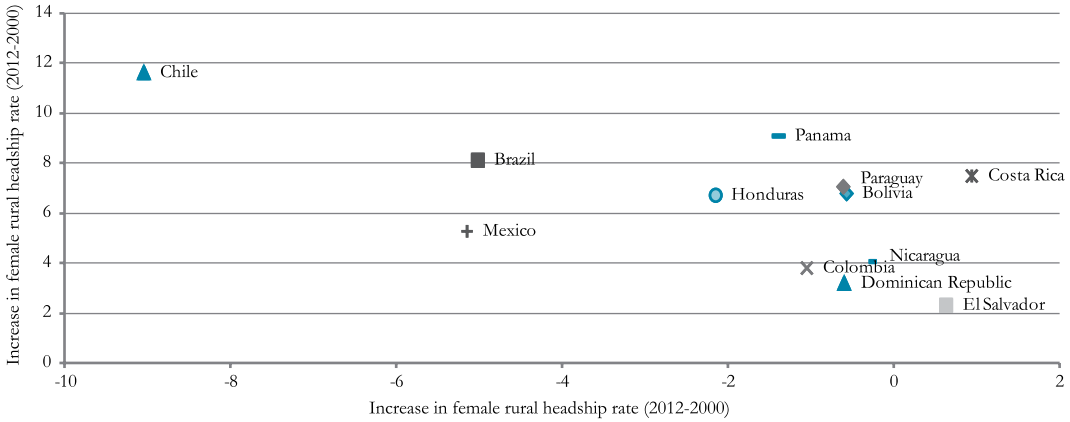


Source: Agricultural Unit, ECLAC, calculated from household surveys.
Note: Countries are ordered from biggest reductions in the rural poverty rate to the smallest.

The rise in female headship may be related to the contraction of the agricultural sector and subsequent expansion of non-agriculture. There is a clear negative correlation between the increase in the rate of rural female headship between 2000 and 2012, and the reduction in the size of the rural agricultural sector in the same period, as depicted in Figure 28. This likely reflects the growing dearth of labor market opportunities in agriculture observed throughout the region (Klasen, Otter, and Villalobos, 2012; Esquivel and Cruces, 2011; Haggblade, Hazell and Reardon, 2010). If rural women younger than 35 found the non-agricultural labor market more favorable, encouraging them to set up households of their own, this could explain the increased headship rates within this age group.

38 This is consistent with the extension of regional social transfer programs to all rural households (Tsounta and Osueke 2014, Cornia 2012, Soares et al. 2009).

Figure 28. Latin America (12 countries): Increase in rural female headship v. changes in the size of the rural salaried agriculture sector (2012-2000)



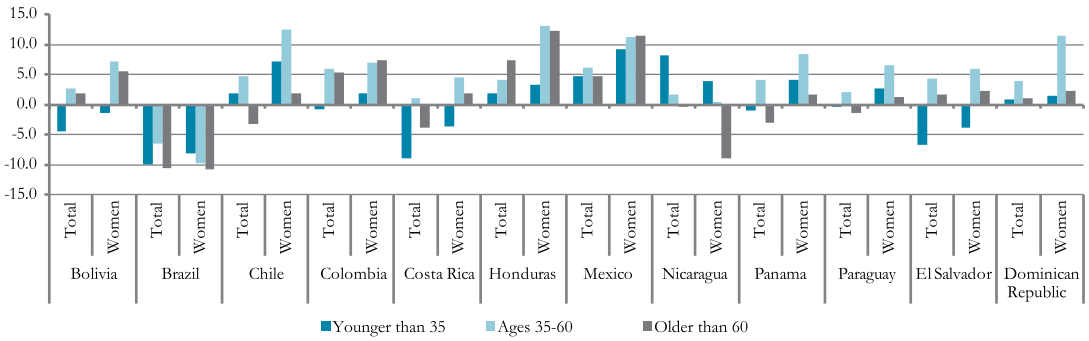
Source: Agricultural Unit, ECLAC, calculated from household surveys.

Rural female employment rates have increased more than overall rural employment rates

Along with the increase in rural women household headship, rural female employment also rose during the last decade (Figure 29). The increases were higher than national employment rates, and, barring a few exceptions, were observed across all ages. Changes in employment rates for the youngest age category (younger than 35) are due to two opposing forces. Employment rates can decrease because younger people remain in education; but rates of employment can shift up or down, depending on labor market opportunities or the need to enter the labor force. The net effect for women younger than 35 is negative in Bolivia, Brazil, Costa Rica, and El Salvador.

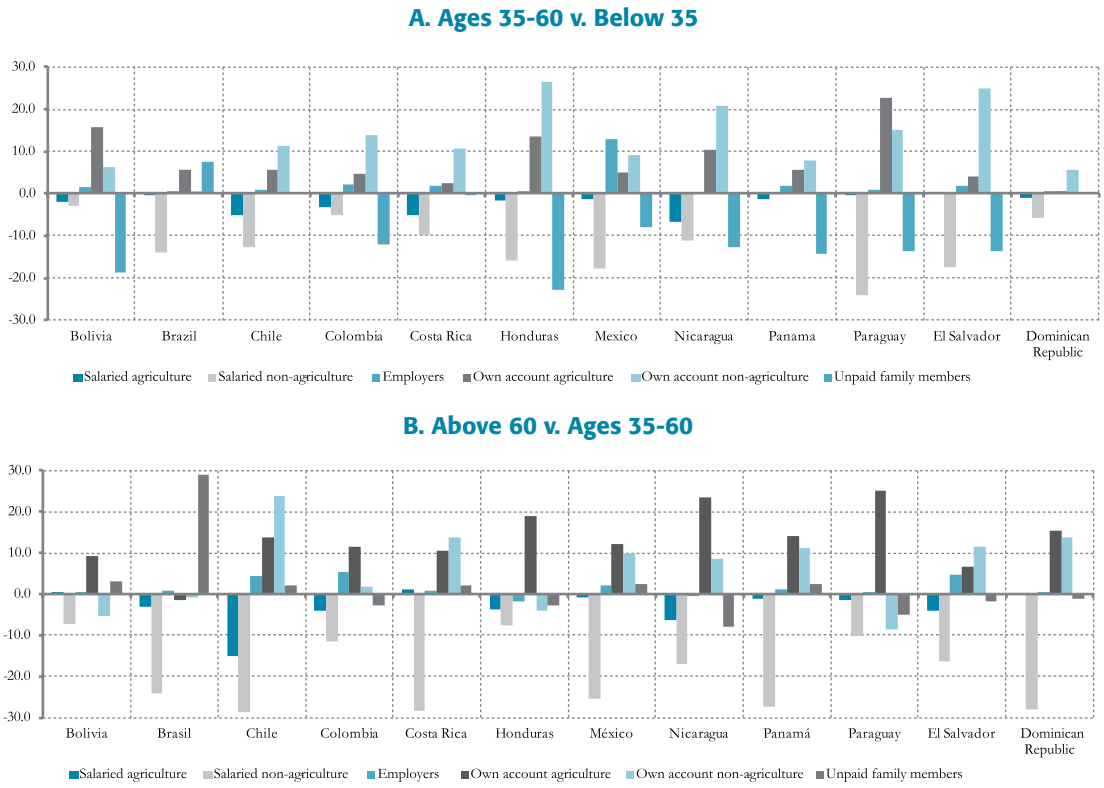
The increase in female employment rates in the middle range (theoretically the most productive group, ages 35-60) is more generalized (with the exception of Brazil) than those for overall

Figure 29. Latin America (12 countries): Change in total rural and rural female employment rates, circa 2012 v. circa 2000, in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.

Figura 30. Latin America (12 countries): Cross-sectional comparison (circa 2012) of rural female employment profiles by age groups (35 to below 60 v. below 35; 35 to below 60 v. above 60) in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.
Notes: To construct Figure 30A, we subtracted the share of rural women ages 35 or below and employed in a particular category from the share of rural women ages 35-60 employed in the same category, circa 2012. In constructing Figure 30B, we performed a similar exercise for rural women ages 35-60 and over 60.

employment (Figure 29). In the older age group (above 60) another phenomenon is at play: retirement/social protection schemes that may reduce participation in the labor market. The net effect in most countries (except in Brazil and Nicaragua) is positive; in 2012, older rural women were more likely to participate in the labor force than in 2000.

The profile of rural female employment changes across age groups

Table A7 (see Appendix) summarizes rural female employment in the 12 countries included in the analysis, in 2000 and 2012, for the three age categories of interest: younger than 35, between 35 and 60, and over 60. The classification captures the main broad age groups, which we can characterize as the younger active population, the adult labor force, and the retirement age population.

Those three broad age groups reflect the change in the employment profile of women as they age, as can be seen in Figure 30, which presents a cross-sectional comparison of employment profiles by age category circa 2012. At younger ages (below 35), the main employment category is salaried non-agriculture (except in

Bolivia and Brazil) and a significant share (more than 20%) are employed as unpaid family members, except in Chile, Costa Rica, and the Dominican Republic. In the middle age range (35-60), women transition from salaried non-agriculture and unpaid work to employment in the own-account non-agricultural sector, and, to a lesser degree, employment in own-account agriculture. At older ages there is a further reduction in salaried non–agriculture employment, and greater increases in both own-account agriculture and non-agriculture.

This is consistent with the idea that as the non-agricultural sector expanded in LAC the situation afforded more opportunities for younger women. It also suggests that as women age and assume traditional roles, they are more likely to leave the labor market and engage in more informal activities (own-account, especially non-agricultural work).

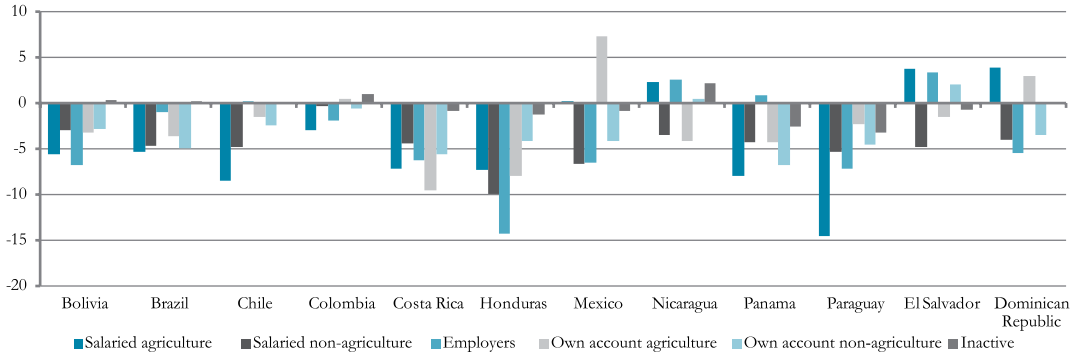
Perspectives on rural youth

As the population ages, the average age of household heads increases, and the age composition of each employment sector changes

Table A8 (see Appendix) presents the (national) distribution of household heads across three age categories (younger than 35, ages 35-60, and over 60) for each country, circa 2000 and circa 2012. The rightward shift in distribution reflects the fact that the average age of the household head rose by nearly two years (from 46.5 years in 2000). On average, the share of household heads aged 35 or under fell by approximately three percentage points. Honduras posted a particularly sharp decline in this age group (more than six percentage points), while Colombia and El Salvador experienced very little change (less than one percentage point). The trend is consistent with the demographic changes occurring in the region, which has experienced lower fertility rates (2.7 in 2000 versus 2.2 in 2013), however the population of LAC as a whole is fairly young: more than one quarter of the population is aged 15 or under (Population Reference Bureau, 2014; ECLAC, 2001). With the combination of these trends, a small but persistent rightward shift in the age distribution of household heads is to be expected.

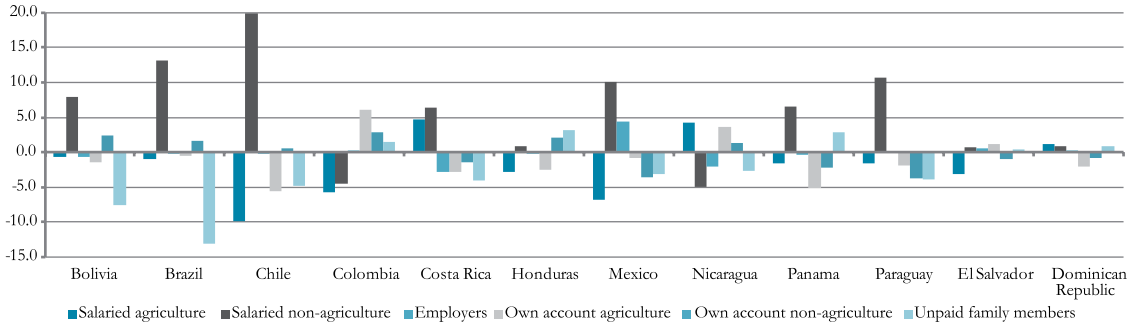
Figure 31 shows how the change in the age distribution of household heads is related to transitions in the household employment distribution, presenting the change between 2000 and 2012 in the share of household heads under 35 in each employment category. The figure indicates that the trend of younger household heads to abandon the different types

Figure 31. Latin America (12 countries): Changes in the share of household heads aged under 35 by employment sector (2012-2000) in percentage points



Fuente: Agricultural Unit, ECLAC, calculated from household surveys.

Figure 32. Latin America (12 countries): Change in employment profiles of rural youth under 35 years of age (circa 2000 v. circa 2012) in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.

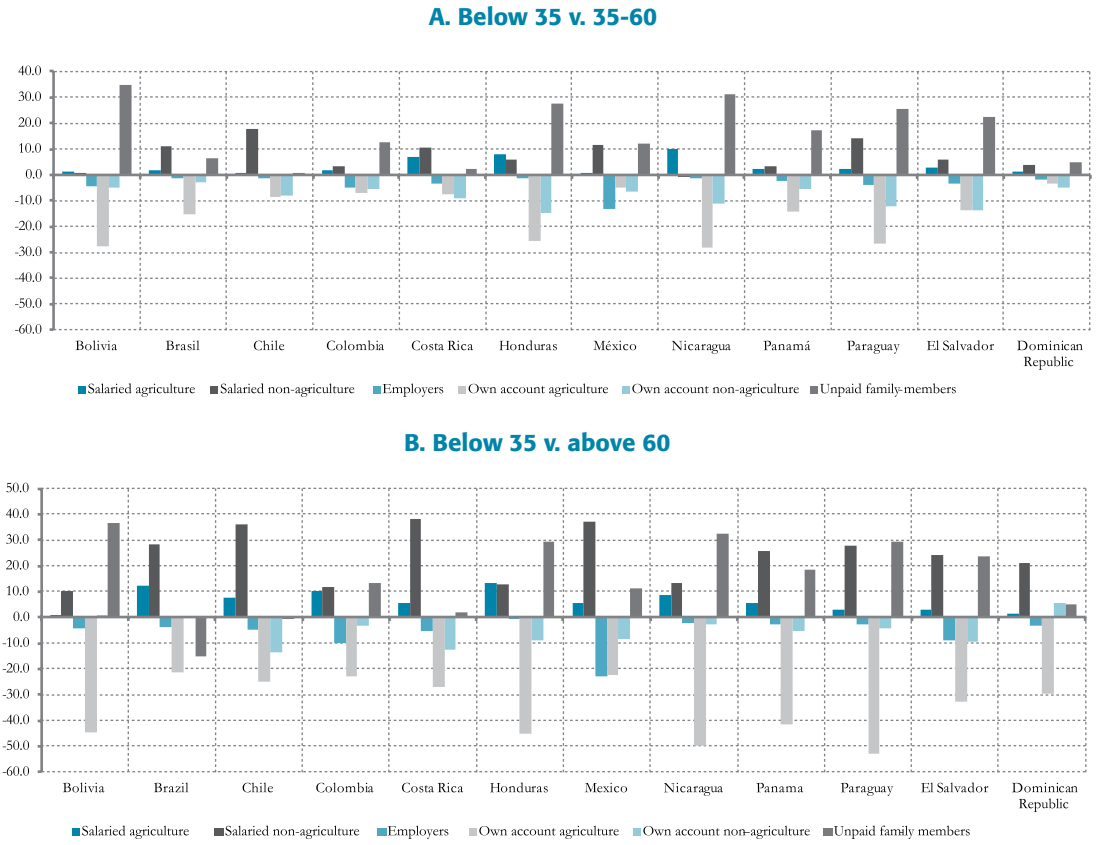
of occupation is similar across the countries. Unsurprisingly, there is little or no shift towards the inactive sector, given their age. Thus, the change in the age profile of household heads presented in Table A8 (see Appendix) is reflected in the employment profile.

Rural youth employment profiles differ amongst countries

The employment profiles for rural youth (under 35 years of age) differ by country (see Table A10), but three general situations can be identified. One group, which includes Bolivia, Brazil, Nicaragua and Paraguay, is characterized by the importance of unpaid family employment. In this group of countries, it is the dominant category and accounts for more than 30% of total employment (both in 2000 and 2012). A second group (Chile, Costa Rica, and the Dominican Republic) is characterized by low rates of unpaid family employment and higher levels of salaried non-agricultural employment. The employment profile in the remaining five countries is mixed: the own-account agricultural employment rate is around 20% (Colombia, Honduras, Paraguay, and the Dominican Republic); unpaid family employment is between 20% and 30% (Colombia, Mexico, Panama and El Salvador); and employment in the salaried agricultural sector is close to 20% (Colombia, Honduras and El Salvador).

Figure 32 depicts the changes in the rural youth employment profile over the last decade. Most important were the reduction in unpaid family employment (seven countries) and the increase in the salaried non-agricultural sector (seven countries). In Bolivia and Brazil, unpaid family employment decreased by five and ten percentage points, respectively, which in both cases translated into increases in salaried employment in the non-agricultural sector. In addition, changes in non-agriculture were also important in Chile, Costa Rica, Mexico, Panama, and Paraguay. The trend was different in Colombia, Honduras, El Salvador, and the Dominican Republic, where the shares of unpaid family occupation increased or stagnated while the shares of salaried non-agricultural employment decreased or remained the same.

Figure 33. Latin America (12 countries): Cross-sectional comparison (circa 2012) of rural employment profiles by age groups (below 35 v. 35-60; below 35 v. above 60) in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.
Notes: To construct Figure 33A, we subtracted the employment rate among ages 35 to 60 employed in a particular category from the employment rate among ages 35 or younger employed in the same category, circa 2012. In constructing Figure 33B, we performed a similar exercise, comparing employed rural citizens older than 60 with those 35 or younger.

Rural youth employment profiles differ from those of older age groups

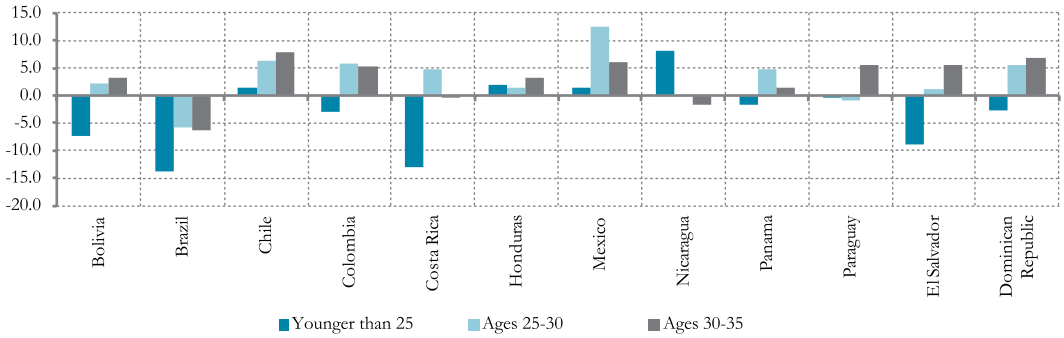
The employment profiles of rural youth (under 35 years of age) differ from those of older age groups, and the differences are consistent across countries. A cross-sectional comparison (circa 2012) of employment profiles by age groups shows three important changes. First, in all countries the shares of unpaid family and salaried non-agricultural employment are higher among youth than those for the group aged 35-60 (Figure 33A). These gaps are even greater when comparing youth to the group aged over 60 (Figure 33B). Second, the shares of own-account agriculture employment are higher among older groups, especially the group over 60 years of age. Third, differences in the share of salaried agriculture and own-account non-agriculture occupations amongst the three age groups are minimal (Figure 33).

A closer look at changes in youth employment between 2000 and 2012

In order to have a better understanding of the longitudinal dynamics of rural youth employment we divided the under 35 age category into three subgroups: (a) under 25; (b) 25 to under 30; and, (c) 30 to 35.

Distinguishing youth below 25 years of age is important in trying to understand the opposing effects of increased labor market opportunities or the need to work versus remaining in the education system. Figure 34 shows that eight countries experienced decreases in the employment rate among youth under 25 years of age (Bolivia, Brazil, Colombia, Costa Rica, Panama, Paraguay, El Salvador, and the Dominican Republic), with Brazil and Costa Rica experiencing the most significant reductions. In contrast, three countries (Chile, Honduras, and Mexico) recorded an increase in the employment rate for youth under 25, but those gains were small in comparison with the

Figure 34. Latin America (12 countries): Changes in rural youth occupation rates (circa 2012 v. circa 2000) in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.

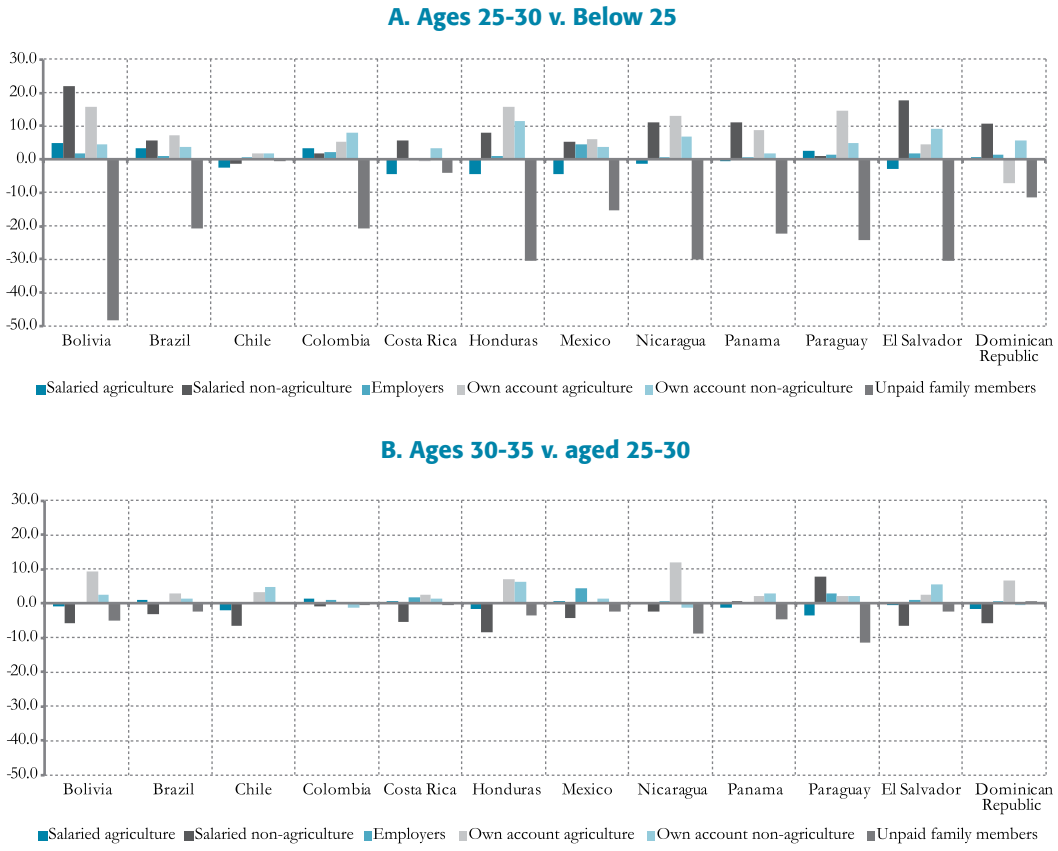
Box 14. Youth employment in Bolivia, Brazil, Costa Rica, and El Salvador

As the period of analysis spans the financial crisis, decreases in youth employment rates could be due to decreased labor market opportunities. However, there is evidence to suggest that in Bolivia, Brazil, Costa Rica, and El Salvador, the low employment rates for youth under the age of 25 could reflect the fact that they remained in the education system (perhaps further incentivized to do so because of low labor demand) (ECLAC, 2012).

For example, secondary enrollment rates increased sharply between 2000 and 2010: ranging from a 7% increase in Bolivia to nearly 30% in Costa Rica. Further, dropout rates from upper secondary school decreased (Kattan and Székely, 2015).

During the late 1990s and early 2000s, these countries implemented expansionary education policies. The public school system increased greatly in Costa Rica and Bolivia; and Brazil increased its per student expenditure by 66% between 2000 and 2010 (Bassi, Busso and Munoz, 2013). An income effect may also be at play: all four countries reported increases in per capita GDP, and reductions in poverty (see Figure 23). As households could afford to spend more on educational investments for youth and did not require them to supplement household income, enrollment rose (Kattan and Székely, 2015).

Figure 35. Latin America (12 countries): Cross-sectional comparison (circa 2000 v. circa 2012) of shares of employment categories among rural youth subgroups (25 to below 30 v. below 25; 30 to 35 v. 25 to below 30) in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.
Notes: In constructing Figure 35A, we subtracted the share of rural youth aged 25 or below employed in a particular category from the share of rural youth ages 25-30 employed in the same category, circa 2012. To construct Figure 35B, we performed a similar exercise for rural youth ages 25-30 and 30-35.

employment gains for the other age subgroups (25 to under 30, and 30 to 35). Nicaragua is an exception to both these trends, as it experienced a sharp increase in the below 25 employment rate, near stagnation in the employment rate for ages 25 to 30, and a decrease in the employment rate amongst ages 30 to 35.

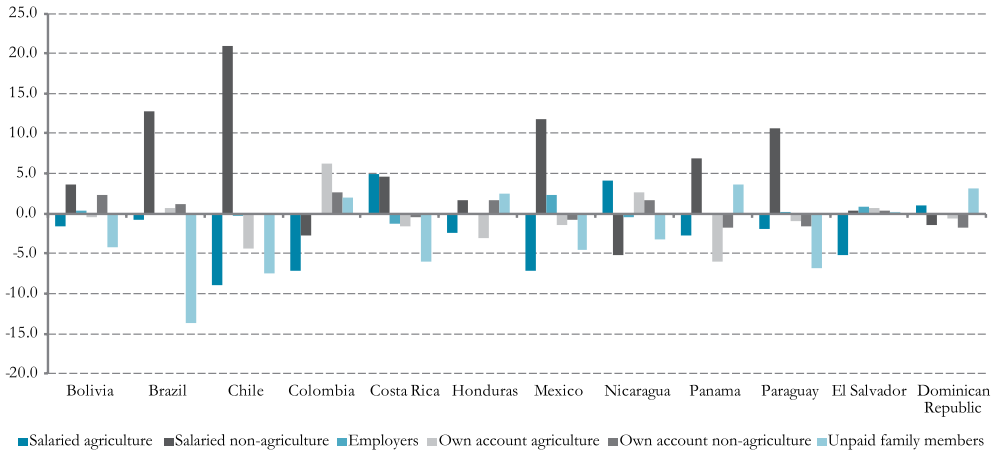
Employment in the below 25 years of age group is dominated by employment as an unpaid family member and in salaried non-agriculture (see Table A11 in the Appendix). Employment as an unpaid family member was over 40% in both periods in half of the countries in our sample (Bolivia, Brazil, Honduras, Nicaragua, Paraguay and El Salvador) and over 50% in Bolivia and Nicaragua. Only in Chile and Costa Rica was the share of rural youth under 25 and engaged in unpaid family employment below 10% circa 2012. On the other hand, the shares of salaried non-agricultural employment in the most recent period were 25% in three quarters of the countries (except for Bolivia, Brazil, Colombia and Honduras).

A cross-sectional comparison (circa 2012) of the employment profiles of the three youth subgroups indicates that the main difference between them is in the share of unpaid family members, which is higher in the youngest age group (youth below 25) in all countries, versus the group aged 25 to 30 (Figure 35A). In eight countries, except for Chile, Costa Rica, Mexico, and the Dominican Republic, the difference is more than 20%. The employment profiles of the other two subgroups do not differ significantly. These results indicate that employment as an unpaid family member is confined mainly to the youngest age category in all countries.

It is interesting to note that the lower shares of unpaid family members in the group aged 25 to 30 (versus the youngest subgroup) translates into significant increases in own-account agriculture employment (more than 10%) in several countries. The same phenomenon is observed, but attenuated, across youth groups of middle (25 to 30) and older (30 to 35) age categories (Figure 35B). These factual observations signal a change in roles within agriculture-related rural households that deserves further analysis.

Finally, a longitudinal comparison of the occupation profile of the youngest subgroup shows that in several countries unpaid family member occupation declined, which translates into increases in salaried non-agriculture employment (Figure 36).

Figure 36. Latin America (12 countries): Changes in the employment profile of youth younger than 25 (circa 2012 v. circa 2000) in percentage points



Source: Agricultural Unit, ECLAC, calculated from household surveys.
Notes: The figure shows the result of subtracting the share of rural youth aged 25 or below and employed in a particular category in 2012 from the share of rural youth aged 25 or below and employed in the same category in 2000.

Implications for public policy

The analysis carried out for this biennial report focuses on rural inequality, youth and gender perspectives in the rural milieu, based on data from household surveys carried out in 12 countries. The results provide further support for recommendations discussed in earlier reports (especially the preceding one) regarding the importance of policies to promote diversification of the rural economy (to expand employment creation) and the acquisition of skills (to take advantage of new employment opportunities). As emphasized in the previous report, these policies are crucial for a more significant reduction of poverty among agricultural households and for the reduction of rural poverty in general.

Policies intended to foster economic diversification should contribute to creating adequate conditions to:

- Develop new productive activities—which can be non-agricultural or higher value added within agriculture—to absorb the jobs lost in segments of family agriculture that are less economically viable in the context of structural changes.

- Create capacities in the rural population to facilitate their integration into new economic activities.

- Create the correct incentives and opportunities for youth to remain in the school system so they at least complete their secondary education.

- Stimulate higher-productivity family agriculture segments, as well as family agriculture with higher economic, social and environmental potential, even in segments that can be considered subsistence agriculture.

Skill acquisition, through the formal education system or capacity development programs, is relevant for the adoption of new technologies and innovations, for accessing higher-paying jobs within and outside of agriculture, and to facilitate the possibility of the modernization of production. As the results of our analysis suggest, the acquisition of additional skills ultimately helps reduce rural poverty and inequality in the long-term.

The analysis also suggests that the contraction of social programs might stymie achievements made in reducing poverty and income inequality. The continuation of these policies is essential to at least maintain what has been accomplished up to now, as well as a minimum commitment to providing the financial resources required to guarantee sustainability. At a time of economic slowdown and fiscal restraint, this becomes a major challenge that each country will have to address in light of its particular situation.

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Appendix

Table 10. Latin America (12 countries): Household employment distribution (national, urban, and rural), circa 2000 and 2012

Country	Zone	Salaried agriculture		Salaried non-agriculture		Employers		Own account agriculture		Own account non-agricul-ture		Inactive	
		2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012
Bolivia	National	3.49	2.84	28.01	33.89	7.03	7.16	25.21	20.33	22.37	21.4	13.9	14.39
	Urban	2.03	1.53	39.71	43.22	5.68	6.74	2.75	2.10	31.57	28.36	18.26	18.04
	Rural	5.91	5.34	8.47	15.95	9.27	7.97	62.72	55.34	7.00	8.03	6.62	7.37
Brazil	National	5.42	3.90	38.84	40.01	5.03	3.76	7.17	4.61	16.12	14.10	27.42	33.61
	Urban	2.58	1.81	43.46	44.13	5.12	4.00	2.08	1.25	17.92	15.24	28.84	33.57
	Rural	21.74	16.72	12.34	14.78	4.54	2.28	36.38	25.16	5.75	7.17	19.24	33.89
Chile	National	7.07	4.9	43.74	43.99	4.61	1.72	3.04	1.97	13.33	13.91	28.2	33.51
	Urban	3.47	2.43	48.41	47.5	4.93	1.72	0.80	0.67	14.6	14.73	27.8	32.95
	Rural	30.54	21.49	13.31	20.38	2.56	1.75	17.64	10.72	5.10	8.37	30.84	37.29
Colombia	National	7.59	5.99	26.97	28.72	6.08	5.87	9.05	8.42	24.8	27.66	25.38	23.29
	Urban	2.70	1.52	32.23	34.16	5.91	5.53	2.87	1.94	28.77	31.72	27.37	25.09
	Rural	22.7	21.65	10.73	9.67	6.60	7.06	28.13	31.16	12.58	13.44	19.23	16.98
Costa Rica	National	7.81	7.60	40.92	42.22	8.80	3.83	5.05	3.66	14.1	13.41	23.34	29.29
	Urban	1.81	1.59	48.36	48.65	9.13	4.05	0.75	0.64	15.53	14.88	24.41	30.19
	Rural	16.84	17.78	29.70	31.32	8.29	3.44	11.52	8.78	11.93	10.92	21.72	27.76
Honduras	National	8.49	7.33	25.64	22.6	3.47	0.81	25.68	24.48	17.85	23.16	18.87	21.62
	Urban	2.37	2.16	39.97	34.67	5.25	0.54	5.23	4.87	25.19	31.65	21.99	26.11
	Rural	14.45	12.30	11.70	11.00	1.73	1.07	45.57	43.30	10.70	15.02	15.84	17.31
Mexico	National	6.99	5.11	46.24	47.64	6.39	11.49	7.34	4.24	14.47	9.31	18.56	22.22
	Urban	0.86	1.03	57.96	55.82	5.97	8.08	0.75	0.32	15.90	10.36	18.57	24.39
	Rural	17.75	12.6	25.69	32.60	7.13	17.76	18.89	11.43	11.97	7.39	18.56	18.22
Nicaragua	National	9.84	7.92	27.34	25.39	7.89	1.56	15.3	19.83	18.00	22.47	21.53	22.47
	Urban	6.05	2.93	35.72	33.83	6.48	1.42	3.41	3.77	24.31	31.42	23.87	26.25
	Rural	15.86	15.57	14.05	12.44	10.11	1.76	34.17	44.44	7.99	8.77	17.82	16.66
Panama	National	5.48	4.35	38.00	42.80	3.48	3.37	12.57	9.71	14.55	14.02	25.92	25.74
	Urban	1.42	1.04	48.86	53.17	4.01	3.79	1.06	0.80	15.16	14.92	29.50	26.29
	Rural	12.84	11.45	18.29	20.59	2.53	2.48	33.46	28.80	13.45	12.10	19.43	24.57
Paraguay	National	4.13	3.53	29.26	32.74	8.22	6.91	20.12	16.09	17.78	18.11	20.48	22.61
	Urban	1.01	0.83	39.09	42.46	9.87	8.03	2.40	2.65	23.11	21.72	24.51	24.31
	Rural	8.20	7.59	16.41	18.12	6.07	5.23	43.31	36.3	10.81	12.69	15.21	20.07
El Salva-dor	National	6.88	7.21	32.44	34.91	5.96	4.99	9.54	8.87	17.26	18.18	27.55	25.81
	Urban	1.98	2.74	41.43	42.38	6.11	5.17	1.89	3.02	20.37	21.51	27.89	25.16
	Rural	15.17	15.80	17.25	20.54	5.70	4.66	22.46	20.12	11.99	11.77	26.98	27.07
Dominican Republic	National	2.41	2.09	30.52	32.47	3.46	3.19	12.97	9.89	22.53	24.19	28.10	28.17
	Urban	0.67	0.63	37.84	37.86	4.19	3.53	3.01	3.46	24.73	25.47	29.57	29.06
	Rural	5.68	5.08	16.77	21.53	2.07	2.50	31.72	22.95	18.40	21.59	25.36	26.35

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 11. Latin America (12 countries): Poverty rates (national, urban, and rural) by household employment categories, 2000 & 2012

Country	Zone	Total		Salaried agriculture		Salaried non-agriculture		Employers		Own account agriculture		Own account non-agriculture		Inactive	
		2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012
Bolivia	National	55.49	36.26	53.43	27.88	39.75	21.69	44.99	27.20	83.37	66.18	51.20	33.18	49.36	39.05
	Urban	44.93	27.69	65.78	26.91	39.87	20.70	27.31	15.89	63.30	66.48	52.00	32.71	44.12	36.50
	Rural	73.12	52.72	46.34	28.41	38.85	26.82	63.09	45.59	84.84	66.16	45.19	36.36	73.49	51.07
Brazil	National	29.93	14.48	58.54	27.70	26.48	9.56	6.20	1.47	50.07	29.21	28.87	12.95	28.86	18.89
	Urban	27.36	12.69	58.99	24.67	25.92	9.27	5.17	1.08	48.68	28.18	28.21	12.06	28.55	17.63
	Rural	44.68	25.45	58.24	29.71	37.75	14.76	12.87	5.62	50.52	29.52	40.72	24.59	31.47	26.52
Chile	National	16.32	9.24	27.95	9.38	14.44	6.38	1.40	0.94	20.81	4.66	11.58	6.04	20.50	14.99
	Urban	15.87	9.45	34.91	14.90	14.46	6.57	1.33	0.82	21.88	5.36	11.62	6.20	20.58	15.19
	Rural	19.23	7.79	22.80	5.18	14.04	3.41	2.25	1.76	20.49	4.37	10.92	4.21	20.01	13.76
Colombia	National	42.18	26.70	46.99	23.21	27.93	12.94	21.38	11.82	72.88	56.46	46.94	31.27	45.22	32.08
	Urban	38.61	23.25	58.64	34.90	28.51	13.04	16.64	7.95	70.92	60.96	45.65	29.75	42.43	28.64
	Rural	53.18	38.81	42.73	20.34	22.52	11.72	34.48	22.45	73.49	55.48	56.03	43.84	57.48	49.86
Costa Rica	National	18.61	15.39	10.99	8.62	7.92	8.78	11.18	5.60	43.93	30.68	21.26	21.41	35.64	23.28
	Urban	15.86	14.25	9.67	12.46	8.12	9.32	9.00	5.37	27.95	26.59	20.79	20.54	30.71	20.13
	Rural	22.76	17.31	11.20	8.03	7.42	7.35	14.81	6.08	45.50	31.18	22.19	23.44	44.01	29.09
Honduras	National	70.93	61.20	92.41	84.22	52.45	37.66	30.47	20.84	88.67	80.36	69.58	55.58	70.93	63.84
	Urban	60.43	50.85	85.89	75.25	51.50	36.23	31.01	21.65	84.64	74.00	69.48	54.86	64.79	59.68
	Rural	81.14	71.14	93.45	85.73	55.62	41.98	28.87	20.45	89.11	81.05	69.80	57.05	79.21	69.85
Mexico	National	33.26	29.87	71.70	50.46	29.43	28.58	12.43	29.93	58.80	51.01	24.94	27.90	31.85	24.67
	Urban	26.48	26.58	66.62	41.78	27.94	29.62	10.84	19.08	46.69	25.89	24.50	27.41	25.98	21.12
	Rural	45.13	35.92	72.13	51.76	35.33	25.30	14.77	38.99	59.64	52.32	25.96	29.16	42.15	33.41
Nicaragua	National	36.58	33.03	61.96	59.77	23.43	19.52	26.59	6.85	67.5	55.89	25.26	20.82	32.91	32.94
	Urban	22.45	19.85	48.80	50.56	17.37	16.08	12.33	2.81	48.37	27.00	23.35	18.48	21.56	22.93
	Rural	58.99	53.24	69.93	62.43	47.88	33.84	41.11	11.87	70.52	59.64	34.48	33.70	57.04	57.13
Panama	National	29.97	19.82	40.46	36.59	15.90	8.47	7.18	1.23	66.32	52.33	27.35	11.92	35.31	30.34
	Urban	21.80	12.96	39.23	41.65	15.91	8.18	5.99	1.50	49.34	33.92	24.59	9.86	30.43	24.29
	Rural	44.81	34.51	40.70	35.61	15.81	10.08	10.60	0.36	67.29	53.42	32.99	17.35	48.74	44.20
Paraguay	National	50.67	43.81	62.61	45.40	36.59	34.81	24.13	17.47	74.37	68.01	47.51	40.62	58.52	49.98
	Urban	42.34	38.61	70.91	62.00	36.88	36.68	18.81	12.24	64.42	68.67	46.63	40.09	53.16	45.27
	Rural	61.57	51.63	61.26	42.66	35.69	28.19	35.44	29.53	75.09	67.94	49.97	41.99	69.82	58.55
El Salvador	National	42.93	38.95	66.65	54.99	27.16	27.60	25.46	18.56	77.15	66.85	38.14	39.54	50.42	43.72
	Urban	34.73	35.24	65.96	60.29	26.29	27.82	15.49	14.59	73.48	70.59	37.17	40.04	44.92	40.84
	Rural	56.80	46.08	66.80	53.23	30.71	26.74	43.56	27.03	77.67	65.77	40.92	37.76	60.04	48.86
Dominican Republic	National	42.24	37.91	56.25	53.26	31.53	37.61	6.00	3.17	51.79	40.55	33.99	14.27	59.32	60.44
	Urban	37.98	36.07	57.12	49.68	29.33	37.06	2.20	0.57	48.33	38.43	33.93	14.61	56.01	57.32
	Rural	50.26	41.67	56.06	54.16	40.86	39.60	20.46	10.63	52.41	41.20	34.15	13.45	66.59	67.44

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 12. Latin America (12 countries): Gini coefficients and Palma ratios (national, urban, and rural), 1996/1997 and 2008/2009

Country	Zone	Gini		Palma	
		1996/1997	2008/2009	1996/1997	2008/2009
Bolivia	National	0.595	0.508	5.950	3.500
	Urban	0.531	0.450	3.750	2.480
	Rural	0.637	0.524	7.220	4.200
Brazil	National	0.637	0.576	7.460	4.960
	Urban	0.620	0.569	6.490	4.790
	Rural	0.578	0.523	5.200	3.720
Chile	National	0.553	0.524	4.390	3.580
	Urban	0.545	0.524	4.000	3.570
	Rural	0.491	0.466	3.000	2.600
Colombia	National	0.569	0.553	4.690	4.450
	Urban	0.560	0.530	4.450	3.800
	Rural	0.488	0.466	3.030	2.680
Costa Rica	National	0.450	0.501	2.460	3.230
	Urban	0.429	0.494	2.180	3.110
	Rural	0.426	0.465	2.160	2.630
Honduras	National	0.558	0.554	4.490	4.880
	Urban	0.527	0.465	3.670	2.610
	Rural	0.504	0.543	3.280	4.250
Mexico	National	0.526	0.515	3.660	3.490
	Urban	0.504	0.487	3.220	2.930
	Rural	0.456	0.493	2.490	3.050
Nicaragua	National	0.583	0.478	5.560	2.860
	Urban	0.551	0.443	4.310	2.320
	Rural	0.558	0.462	4.860	2.650
Panama	National		0.526		3.740
	Urban	0.543	0.479	4.180	2.850
	Rural		0.506		3.320
Paraguay	National		0.512		3.530
	Urban	0.493	0.438	3.030	2.290
	Rural		0.584		5.020
El Salvador	National	0.510	0.478	3.380	2.860
	Urban	0.467	0.451	2.680	2.470
	Rural	0.423	0.418	2.110	2.080
Dominican Republic	National	0.586	0.574	5.300	4.870
	Urban	0.598	0.585	5.830	5.340
	Rural	0.503	0.502	3.400	3.320

Source: Agricultural Unit, ECLAC, calculated from CEPAL Stat.

Table 13. Latin America (12 countries): Rural female headship rates (national, urban, and rural), circa 2000 and 2012

Country	Zone	All households		Salaried agriculture		Salaried non-agriculture		Employers		Own account agriculture		Own account non-agriculture		Inactive	
		2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012
Bolivia	National	19.84	24.48	7.79	11.29	14.39	18.00	10.13	15.47	10.22	17.48	26.18	31.61	46.03	46.11
	Urban	23.48	26.54	5.91	12.18	14.70	17.7	10.59	16.58	7.94	19.99	27.63	31.10	43.71	46.21
	Rural	13.76	20.54	8.86	10.81	11.92	19.56	9.67	13.66	10.38	17.30	15.24	35.06	56.68	45.64
Brazil	National	24.43	37.06	3.32	5.17	21.3	33.11	7.85	16.24	5.96	8.15	15.20	25.00	46.33	56.83
	Urban	26.33	39.59	4.20	8.80	21.67	33.64	8.06	16.83	6.61	9.13	15.40	25.57	46.80	59.28
	Rural	13.49	21.60	2.73	2.76	13.82	23.42	6.47	9.84	5.74	7.85	11.56	17.60	42.33	41.95
Chile	National	23.19	38.77	4.25	14.79	16.58	30.42	8.62	20.99	4.41	10.65	17.86	31.27	45.12	58.91
	Urban	24.35	40.48	7.11	22.26	16.87	31.03	8.79	22.06	6.02	16.61	17.97	32.11	46.17	60.63
	Rural	15.64	27.25	2.14	9.09	9.82	20.71	6.42	13.97	3.94	8.15	15.84	21.36	38.94	48.72
Colombia	National	25.70	32.90	3.96	5.35	23.39	29.82	11.17	14.48	4.74	7.64	24.37	33.67	46.88	56.62
	Urban	28.54	36.38	8.98	12.47	24.05	30.55	11.28	16.01	1.81	6.69	24.09	33.24	46.94	56.46
	Rural	16.93	20.73	2.12	3.60	17.35	20.82	10.89	10.28	5.66	7.84	26.36	37.26	46.63	57.42
Costa Rica	National	24.95	34.63	4.18	6.43	20.69	31.08	7.28	8.98	2.34	5.18	22.50	24.30	52.41	58.83
	Urban	28.42	39.02	1.22	4.29	22.45	33.27	8.79	10.60	3.51	5.76	23.94	25.58	53.24	61.26
	Rural	19.72	27.20	4.66	6.75	16.36	25.31	4.78	5.74	2.23	5.11	19.67	21.36	51.01	54.36
Honduras	National	25.21	31.70	2.51	6.85	19.87	24.58	12.98	11.49	4.18	8.34	36.16	40.72	63.21	65.11
	Urban	31.37	37.71	5.59	6.63	21.86	27.24	12.85	0.00	3.99	5.09	33.72	37.34	59.69	61.48
	Rural	19.23	25.94	2.01	6.89	13.28	16.53	13.34	17.05	4.20	8.69	41.74	47.54	67.97	70.37
Mexico	National	18.38	25.30	1.12	4.98	12.21	18.86	4.66	17.01	8.86	9.95	22.34	31.69	45.67	48.3
	Urban	19.61	27.37	2.97	8.95	12.67	20.29	2.78	15.87	9.19	5.27	21.03	28.62	46.68	47.93
	Rural	16.22	21.49	0.97	4.38	10.36	14.39	7.41	17.95	8.83	10.19	25.38	39.61	43.88	49.20
Nicaragua	National	28.79	34.39	4.33	5.29	23.43	30.76	8.89	13.24	5.60	6.35	44.74	44.01	57.20	65.36
	Urban	34.85	41.66	4.01	3.55	25.14	32.50	10.23	13.41	2.64	3.33	44.59	42.40	58.60	63.73
	Rural	19.17	23.23	4.52	5.79	16.56	23.53	7.52	13.02	6.06	6.74	45.46	52.84	54.22	69.27
Panama	National	24.28	31.92	1.59	2.25	22.28	29.57	7.66	15.36	2.81	8.59	17.35	24.16	48.55	56.03
	Urban	28.88	35.14	2.26	6.52	23.47	30.89	7.24	15.97	1.55	7.04	18.28	24.32	48.49	54.61
	Rural	15.94	25.02	1.46	1.41	16.51	22.24	8.87	13.38	2.88	8.69	15.44	23.72	48.72	59.30
Paraguay	National	25.29	30.86	3.27	5.23	18.07	23.01	7.20	12.06	10.14	16.72	30.63	34.55	57.58	59.07
	Urban	29.64	33.65	5.44	12.15	19.36	24.02	9.19	15.41	18.36	28.49	31.50	35.39	54.64	56.24
	Rural	19.61	26.66	2.92	4.09	14.05	19.48	2.96	4.32	9.54	15.42	28.20	32.41	63.76	64.22
El Salvador	National	32.32	35.14	2.97	6.34	19.59	22.95	17.17	21.83	3.70	5.28	51.60	52.24	56.05	60.41
	Urban	35.30	38.02	5.70	10.51	20.63	24.49	21.37	26.83	3.16	3.64	50.78	51.06	53.38	59.05
	Rural	27.29	29.60	2.36	4.95	15.37	16.85	9.54	11.14	3.77	5.75	53.95	56.40	60.72	62.84
Dominican Republic	National	30.40	34.69	0.59	2.66	25.65	33.21	12.15	20.83	2.67	3.56	19.61	22.67	61.82	61.59
	Urban	34.21	38.75	0.00	5.01	27.16	35.17	13.08	25.18	3.71	5.06	20.55	24.76	61.55	62.06
	Rural	23.24	26.43	0.72	2.07	19.27	26.19	8.59	8.37	2.49	3.10	17.23	17.65	62.41	60.54

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 14. Latin America (12 countries): Total rural and rural female employment rates by age category, circa 2000 and 2012

Country	Level	Younger than 35		Ages 35-60		Older than 60	
		2000	2012	2000	2012	2000	2012
Bolivia	Total	62.6	58.0	87.4	90.1	75.4	77.3
	Women	53.0	51.7	76.0	83.2	61.1	66.6
Brazil	Total	61.0	51.0	83.0	76.5	56.4	45.8
	Women	44.2	36.1	71.0	61.4	41.5	30.7
Chile	Total	36.5	38.4	56.0	60.8	25.2	21.9
	Women	18.4	25.7	22.9	35.4	6.5	8.3
Colombia	Total	46.4	45.6	67.7	73.7	43.4	48.8
	Women	25.9	27.8	43.0	50.0	19.7	27.0
Costa Rica	Total	46.9	37.9	63.2	64.3	27.4	23.5
	Women	27.0	23.4	34.8	39.4	6.5	8.3
Honduras	Total	43.0	45.0	63.9	67.9	45.3	52.6
	Women	18.1	21.3	32.0	45.1	16.6	28.9
Mexico	Total	47.5	52.1	67.6	73.7	46.9	51.6
	Women	28.5	37.8	44.7	55.9	23.8	35.2
Nicaragua	Total	39.3	47.6	65.0	66.6	44.1	43.7
	Women	18.2	22.0	38.9	39.3	19.7	10.9
Panama	Total	40.1	39.1	66.2	70.3	42.7	39.7
	Women	19.4	23.5	35.4	43.8	14.6	16.2
Paraguay	Total	49.5	49.1	76.3	78.4	53.5	52.1
	Women	29.8	32.5	55.8	62.4	34.2	35.4
El Salvador	Total	43.3	36.6	60.7	65.0	37.4	39.0
	Women	24.7	20.9	37.3	43.2	15.0	17.3
Dominican Republic	Total	34.6	35.6	63.5	67.4	36.3	37.3
	Women	17.2	18.6	31.6	43.1	11.3	13.7

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 15. Latin America (12 countries): Rural female employment rates by age and employment category, circa 2000 and 2012

Country	Zone	Salaried agriculture	Salaried non-agriculture	Employers	Own account agriculture	Own account non agriculture	Unpaid family members
Ages 35 or younger							
Bolivia	2000	1.9	4.2	0.7	5.0	4.3	83.9
	2012	2.7	10.8	0.7	4.7	7.0	74.1
Brazil	2000	5.8	26.4	0.3	4.1	5.4	58.1
	2012	4.6	42.5	0.5	5.7	7.1	39.7
Chile	2000	28.7	53.8	0.5	4.1	6.6	6.3
	2012	28.9	60.9	0.8	2.5	6.1	0.8
Colombia	2000	8.6	33.2	0.5	5.9	27.2	24.2
	2012	9.0	21.1	0.7	12.1	27.7	29.0
Costa Rica	2000	8.3	63.5	2.7	0.8	15.4	9.3
	2012	10.4	73.6	0.7	0.8	11.0	3.5
Honduras	2000	6.4	33.1	0.8	7.8	28.3	23.6
	2012	6.0	28.1	1.1	8.1	27.2	30.3
Mexico	2000	5.0	45.7	0.9	6.0	20.1	22.2
	2012	4.5	53.0	6.1	5.5	11.8	19.1
Nicaragua	2000	5.3	37.2	0.4	1.5	15.9	39.8
	2012	13.8	35.6	0.4	4.0	20.3	25.1
Panama	2000	1.1	46.4	0.5	3.1	24.5	24.3
	2012	2.3	42.7	0.3	4.3	20.2	30.2
Paraguay	2000	2.4	27.4	0.6	21.7	21.1	26.9
	2012	2.5	40.9	0.3	20.9	10.8	24.0
El Salvador	2000	4.4	50.1	0.4	0.5	21.6	22.7
	2012	6.7	45.8	0.8	1.0	25.0	20.6
Dominican Republic	2000	0.9	68.9	0.0	4.1	23.1	3.0
	2012	1.2	65.9	0.6	3.4	26.5	2.4
Age 35-60							
Bolivia	2000	1.2	3.7	2.7	14.8	8.8	68.8
	2012	0.9	7.9	2.2	20.5	13.2	55.4
Brazil	2000	5.2	19.8	0.9	10.3	6.2	57.5
	2012	4.3	28.4	1.0	11.3	7.7	47.3
Chile	2000	20.7	44.7	1.7	9.1	17.4	6.4
	2012	23.7	48.1	1.5	8.3	17.3	1.1
Colombia	2000	6.3	22.0	3.8	13.0	39.8	14.9
	2012	5.7	16.1	2.8	16.9	41.6	16.8
Costa Rica	2000	5.8	55.5	6.0	2.5	24.2	6.0
	2012	5.4	63.6	2.6	3.3	21.7	3.4
Honduras	2000	3.7	14.9	1.6	14.3	59.0	6.5
	2012	4.2	12.3	1.7	21.8	53.5	7.5
Mexico	2000	1.4	30.9	4.2	18.3	31.2	14.0
	2012	3.2	35.2	18.9	10.5	21.0	11.3
Nicaragua	2000	4.5	26.3	3.4	9.6	41.6	14.4
	2012	7.2	24.5	0.6	14.4	41.0	12.3
Panama	2000	2.5	42.3	2.0	6.5	32.9	13.9
	2012	1.0	42.8	2.2	10.0	28.2	15.8
Paraguay	2000	1.9	11.7	1.1	42.8	32.4	10.1
	2012	2.1	16.9	1.2	43.6	25.9	10.2
El Salvador	2000	4.1	26.3	2.5	4.0	57.8	5.1
	2012	6.8	28.4	2.5	5.1	50.0	7.0
Dominican Republic	2000	0.2	49.2	1.2	8.3	38.8	2.3
	2012	0.1	60.1	1.1	4.0	32.1	2.6

Country	Zone	Salaried agriculture	Salaried non-agriculture	Employers	Own account agriculture	Own account non agriculture	Unpaid family members
Ages 60 or older							
Bolivia	2000	0.8	0.2	2.1	29.3	6.3	61.3
	2012	1.0	0.6	2.4	29.6	7.8	58.6
Brazil	2000	2.2	2.1	2.1	12.5	2.8	78.3
	2012	1.2	4.2	1.8	9.6	6.8	76.3
Chile	2000	6.1	12.2	8.0	28.2	32.9	12.6
	2012	8.5	19.4	5.9	22.0	41.0	3.2
Colombia	2000	2.3	6.8	9.1	22.9	43.8	15.2
	2012	1.5	4.4	8.1	28.3	43.5	14.0
Costa Rica	2000	4.4	22.7	7.6	7.9	47.4	9.9
	2012	6.4	35.3	3.5	13.8	35.4	5.6
Honduras	2000	0.5	6.1	1.7	23.7	63.9	4.1
	2012	0.6	4.6	0.0	40.6	49.5	4.7
Mexico	2000	0.7	8.0	6.9	23.9	37.1	23.3
	2012	2.3	9.6	21.1	22.5	30.7	13.8
Nicaragua	2000	0.0	2.7	10.2	23.8	49.6	13.7
	2012	0.9	7.6	0.0	37.7	49.5	4.2
Panama	2000	0.4	10.4	2.2	10.2	60.5	16.3
	2012	0.0	15.2	3.2	24.2	39.2	18.2
Paraguay	2000	1.2	2.6	1.3	68.0	24.8	2.2
	2012	0.8	6.6	1.3	68.6	17.4	5.3
El Salvador	2000	1.5	7.3	4.5	6.7	73.7	6.4
	2012	2.6	12.0	7.2	11.7	61.5	5.1
Dominican Republic	2000	0.0	24.6	2.7	25.2	47.5	0.0
	2012	0.0	31.9	1.3	19.4	45.9	1.5

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 16. Latin America (12 countries): National household head age distribution, circa 2000 and 2012

	Younger than 35		Ages 35-60		Older than 60	
Country	2000	2012	2000	2012	2000	2012
Bolivia	26.40	25.01	53.61	49.73	20.00	25.27
Brazil	25.07	21.37	51.75	52.25	23.18	26.37
Chile	14.82	11.00	54.54	53.58	30.64	35.41
Colombia	23.79	23.28	53.67	53.26	22.54	23.46
Costa Rica	26.67	19.77	56.28	58.86	17.05	21.37
Honduras	28.77	22.21	51.87	53.75	19.35	24.04
Mexico	22.39	21.54	54.09	52.12	23.52	26.34
Nicaragua	27.94	25.46	52.51	54.20	19.55	20.33
Panama	23.50	17.16	52.18	51.59	24.32	31.25
Paraguay	25.18	21.27	55.27	55.44	19.55	23.29
El Salvador	23.31	24.62	52.19	49.90	24.50	25.48
Dominican Republic	21.78	19.65	55.05	52.63	23.17	27.71

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 17. Latin America (12 countries): Employment distribution for household heads aged 35 or younger (national), circa 2000 and 2012

Country	Salaried agriculture		Non-salaried agriculture		Employers		Own acount agriculture		Own account non-agricul-ture		Inactive	
	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012
Bolivia	47.30	41.73	42.69	39.76	28.78	21.98	20.53	17.31	25.03	22.3	23.90	24.21
Brazil	38.12	32.79	37.55	32.93	18.91	17.92	18.40	14.82	24.47	19.58	10.62	10.83
Chile	25.52	17.05	26.93	22.14	10.03	10.26	9.86	8.36	13.26	10.81	7.17	7.26
Colombia	37.34	34.42	36.61	36.31	16.31	14.43	19.55	20.03	21.36	20.76	11.76	12.79
Costa Rica	38.72	31.56	32.57	28.17	17.26	11.08	16.43	6.93	17.49	11.97	9.14	8.32
Honduras	39.38	32.06	44.86	34.90	23.22	8.92	25.13	17.15	24.53	20.39	16.28	15.05
Mexico	27.56	27.77	36.88	30.22	17.35	10.82	9.91	17.24	18.50	14.35	10.64	9.83
Nicaragua	38.59	40.96	37.01	33.57	21.49	24.16	26.75	22.61	19.46	19.91	10.58	12.78
Panama	32.76	24.88	32.28	28.05	14.29	15.24	17.86	13.59	24.39	17.69	12.46	9.95
Paraguay	44.64	30.07	37.40	32.07	19.21	12.13	17.26	14.98	19.67	15.20	15.98	12.75
El Salvador	30.48	34.24	37.38	32.57	11.80	15.21	16.42	14.92	15.81	17.92	12.90	12.28
Dominican Republic	25.01	28.88	35.03	31.12	18.92	13.54	15.14	18.17	26.83	23.38	13.40	13.05

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 18. Latin America (12 countries): Employment distribution for rural youth younger than 35, circa 2000 and 2012

	Year	Salaried agriculture	Salaried non-agri-culture	Employers	Own account agriculture	Own ac-count non agriculture	Unpaid family members
Bolivia	2000	5.1	5.6	2.5	12.9	3.4	70.5
	2012	4.4	13.5	1.8	11.5	5.9	62.9
Brazil	2000	19.4	19.0	0.9	11.0	4.6	45.0
	2012	18.3	32.3	0.8	10.4	6.3	31.9
Chile	2000	43.7	33.2	0.8	11.6	5.2	5.5
	2012	33.8	53.2	0.6	6.0	5.8	0.6
Colombia	2000	27.7	20.3	1.7	18.8	13.6	17.3
	2012	22.0	15.8	1.9	24.9	16.5	18.7
Costa Rica	2000	21.7	50.9	4.0	5.7	9.9	7.9
	2012	26.4	57.3	1.1	2.9	8.5	3.8
Honduras	2000	23.8	17.8	0.7	20.4	9.1	28.1
	2012	21.0	18.6	0.7	17.9	11.2	31.2
Mexico	2000	20.0	40.6	1.8	6.4	9.8	21.4
	2012	13.2	50.7	6.1	5.6	6.2	18.2
Nicaragua	2000	20.1	21.2	2.5	10.6	5.3	40.3
	2012	24.4	16.2	0.4	14.3	6.6	37.7
Panama	2000	16.6	29.1	0.8	17.7	15.6	20.2
	2012	14.9	35.6	0.4	12.6	13.3	23.1
Paraguay	2000	10.9	22.9	1.3	19.2	10.5	35.3
	2012	9.3	33.6	1.5	17.3	6.8	31.3
El Salvador	2000	18.3	36.7	0.9	7.0	8.6	28.0
	2012	20.4	33.6	1.6	7.5	9.8	27.0
Dominican Republic	2000	5.2	39.6	0.7	22.7	26.8	5.1
	2012	6.3	40.5	0.9	20.6	25.9	5.9

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Table 19. Latin America (12 countries): Youth female employment rates by age and employment category, circa 2000 and 2012

Country	Zone	Salaried agriculture	Salaried non-agriculture	Employers	Own account agriculture	Own account non agriculture	Unpaid family members
Ages 25 or younger							
Bolivia	2000	4.5	3.4	0.8	5.1	1.6	84.7
	2012	2.9	7.0	1.2	4.6	4.0	80.5
Brazil	2000	17.4	17.4	0.3	5.3	2.9	56.7
	2012	16.5	30.1	0.2	6.0	4.2	43.0
Chile	2000	44.4	34.8	0.3	8.4	3.8	8.3
	2012	35.6	55.8	0.0	4.1	3.6	0.9
Colombia	2000	27.3	18.1	0.7	16.1	10.4	26.4
	2012	20.0	15.3	0.7	22.3	13.0	28.5
Costa Rica	2000	23.6	51.0	1.8	4.5	6.9	12.2
	2012	28.4	55.7	0.6	2.8	6.4	6.1
Honduras	2000	25.3	15.5	0.4	14.6	4.5	39.7
	2012	22.8	17.2	0.3	11.5	6.2	42.2
Mexico	2000	22.3	37.7	0.6	4.1	4.6	30.7
	2012	15.1	49.6	2.8	2.6	3.8	26.1
Nicaragua	2000	20.3	17.5	0.6	4.9	2.4	54.3
	2012	24.4	12.3	0.1	7.5	4.0	51.1
Panama	2000	18.1	22.6	0.1	13.6	13.3	32.4
	2012	15.3	29.5	0.1	7.7	11.5	35.9
Paraguay	2000	10.7	20.5	0.4	12.4	6.1	50.0
	2012	8.8	31.2	0.5	11.4	4.5	43.2
El Salvador	2000	18.2	33.0	0.2	4.6	4.4	39.4
	2012	21.3	27.9	0.6	5.3	5.0	39.7
Dominican Republic	2000	5.4	37.2	0.2	23.9	24.3	9.0
	2012	6.4	35.8	0.0	23.2	22.5	12.1
Age 25-29							
Bolivia	2000	8.4	12.1	6.6	29.2	7.7	36.1
	2012	7.7	28.8	2.9	20.3	8.3	32.0
Brazil	2000	23.5	21.1	1.6	18.2	7.0	28.7
	2012	19.9	35.9	1.1	13.2	7.8	22.2
Chile	2000	43.2	34.6	1.0	12.0	5.4	3.9
	2012	33.2	54.4	0.8	5.8	5.4	0.3
Colombia	2000	29.1	24.8	1.8	21.4	16.0	6.8
	2012	23.3	17.0	2.8	27.7	21.0	7.9
Costa Rica	2000	20.0	54.4	5.8	5.3	11.4	3.2
	2012	24.0	61.3	0.7	2.1	9.8	2.2
Honduras	2000	22.2	22.4	1.2	30.4	15.1	8.7
	2012	18.2	25.1	1.4	27.1	17.7	11.6
Mexico	2000	17.1	47.1	2.5	7.3	14.8	11.2
	2012	10.8	54.8	7.5	8.5	7.7	10.8
Nicaragua	2000	19.9	27.0	5.9	18.8	10.5	17.9
	2012	23.0	23.6	0.8	20.7	11.0	21.0
Panama	2000	15.9	35.8	0.8	19.4	17.1	11.0
	2012	15.2	40.6	0.8	16.4	13.3	13.6
Paraguay	2000	7.5	29.6	3.9	24.6	18.9	15.4
	2012	11.3	32.4	1.9	26.0	9.6	18.8
El Salvador	2000	17.5	47.8	2.2	11.3	11.6	8.7
	2012	18.6	45.5	2.4	9.8	14.2	9.4
Dominican Republic	2000	5.4	41.4	0.9	20.9	30.9	0.5
	2012	6.9	46.7	1.5	16.0	28.3	0.7

Country	Zone	Salaried agriculture	Salaried non-agriculture	Employers	Own account agriculture	Own account non agriculture	Unpaid family members
Ages 30-35							
Bolivia	2000	4.6	9.1	6.9	38.0	8.3	32.9
	2012	6.9	23.2	2.9	29.5	10.7	26.8
Brazil	2000	21.5	22.2	2.1	21.0	6.9	26.3
	2012	20.7	32.6	1.4	16.2	9.1	19.9
Chile	2000	43.4	29.2	1.4	15.6	7.0	3.4
	2012	31.3	47.8	1.2	8.9	10.2	0.6
Colombia	2000	26.8	21.1	4.1	23.4	18.6	5.9
	2012	24.7	16.1	3.9	28.0	19.7	7.5
Costa Rica	2000	19.1	47.8	6.9	8.2	14.9	3.2
	2012	24.5	55.8	2.5	4.4	11.2	1.5
Honduras	2000	19.5	20.9	1.4	34.1	19.3	4.8
	2012	16.5	16.7	1.6	34.1	24.1	7.9
Mexico	2000	17.7	42.0	4.0	11.6	16.5	8.3
	2012	11.2	50.5	11.9	8.7	9.2	8.5
Nicaragua	2000	18.3	29.4	6.9	25.8	11.2	8.4
	2012	23.1	21.2	1.4	32.5	9.9	12.0
Panama	2000	14.9	33.1	1.7	23.9	18.7	7.7
	2012	13.9	41.1	1.2	18.6	16.3	8.8
Paraguay	2000	13.6	22.9	2.1	34.0	18.8	8.6
	2012	7.7	40.1	4.7	28.2	11.8	7.5
El Salvador	2000	18.9	36.0	3.2	12.1	22.9	6.4
	2012	18.5	39.1	3.4	12.3	19.7	7.0
Dominican Republic	2000	4.6	42.9	1.3	22.9	26.9	1.3
	2012	5.2	40.9	2.0	22.6	28.3	1.1

Source: Agricultural Unit, ECLAC, calculated from household surveys.

Chapter 4: Policies and Institutional Framework

Policies and Institutional Framework

Given its productive and commercial capacity, agriculture in Latin America and the Caribbean (LAC) is called on to play a fundamental role in supplying food to the world, and in improving the situation of its farmers. To accomplish this, the region needs modern, responsive and efficient policies and programs that will raise agricultural productivity in a sustainable and inclusive manner. In pursuit of this objective, the countries of the region have advanced not only in the formulation of sectoral policies but also in the coordination of efforts among the different institutions that make up the architecture of the countries and together influence the sector's performance. In addition to its own efforts, the region's agricultural development will be impacted by policies implemented by the United States (US), the European Union (EU), India and China, global agricultural powerhouses in terms of both production and trade.

Facts

- Total factor productivity in agriculture in LAC is growing faster than the average global rate, while the region's share of world agricultural exports is also increasing.
- Although the number of families in extreme poverty has fallen in recent years, the phenomenon of poverty persists, particularly in the rural areas of some countries of the region.
- The effects of climate change and environmental degradation are becoming increasingly more evident in the region, exacerbating climate variability and, consequently, variations in agricultural production.
- In recent years, agricultural policies in the region have been focused on strengthening the sector's productive and commercial profile, while at the same time promoting wider participation in the sector's growth and environmental sustainability.

Trends

Agricultural policies outside of LAC

Mindful of the new challenges facing agriculture, in recent years the world's main producing and exporting countries have designed and implemented policies aimed at ensuring the competitiveness of their sectors, placing emphasis on risk management and the establishment of strategies to increase sustainability and equity in the rural environment. These changes are forcing LAC to "design and strengthen strategies to promote the competitiveness of its agriculture, with special attention on risk reduction, environmental sustainability, associativity, innovation and territorial development, with a long-term vision" (IICA, 2014).

The 2014 US Farm Bill: On February 7, 2014, President Barack Obama signed a new Agricultural Act into law, whose principal change was the elimination of the previous direct payment, counter-cyclical payment, and other programs that supported producers with fixed sums per unit of production, and established price supports and a floor for incomes. Those programs were replaced with new mechanisms that are less distorting of agricultural markets, oriented toward managing the risks faced by the producers throughout value chains, and include measures ranging from price and income coverage to assistance in the wake of agricultural disasters, and a broad program of crop insurance. These programs enjoy government support through subsidies on insurance premiums and coverage. In addition, complementary programs were established for research and extension, energy, horticulture, nutrition, rural development, the environment and trade.

Box 15. Agricultural policies in China and India

In recent years, LAC has increased its share of world agricultural exports, in large measure thanks to the growth of imports in countries such as China and India. The rapid increase in the demand for food in those countries has opened up new opportunities for trade with the region, opportunities that could be affected by the policies introduced in those two countries recently aimed at increasing agricultural yields, achieving food self-sufficiency and raising rural incomes.

People's Republic of China: In order to increase food self-sufficiency in a scenario of rapid population growth, in the last ten years the People's Republic of China has implemented a sweeping agricultural policy based on a reform that put an end to collectivization in the countryside, reduced State controls on agricultural products, permitted free enterprises in rural areas, and encouraged promotion of science and technology for agriculture. In recent years, the sharp decline in arable land available per person and the growing food needs of the population forced the government to establish new objectives under its agricultural policy, including self-sufficiency in rice, wheat and corn. In order to achieve this, China has established a series of new measures not only to raise the yields of those crops but also to have greater government control over transactions in them, giving priority to sales in domestic markets. While gains in yields have been based on increased investments in technology and greater use of fertilizers, the State continues to exercise great control over cereal markets, especially in the case of the supply, placing distribution in the hands of state-owned enterprises (Trápaga, 2014). Within this new strategy, China assigns a privileged place to self-sufficiency in basic grains at the cost of greater imports of soybeans, pork, dairy products, coffee and processed foods, a policy that could offer trade opportunities to some countries of the LAC region.

India: Like China, India needs to feed a vast and growing population, the difference being that it has a surplus in agriculture (Baldwin and Bonarriva, 2013). Its principal agricultural challenges are the need to increase crop yields, raising at the same time levels of employment and income in rural areas, above all for the poorest groups. In pursuit of these objectives, India has been developing policies for more than a decade designed to increase infrastructure in rural areas, access to credit and other productive assets, farmers' use of modern methods (fertilizers, irrigation, electricity, etc.) and to guarantee their incomes (guaranteed prices and profitability). Indian agricultural policy has been successful in developing strategies applicable to the millions of small farmers who are the basis of its agriculture.

Without doubt, the evolution of the economies of India and China, both major players in world food markets, will have a strong impact on demand for, and prices of, the agricultural products exported from LAC.

The EU's Common Agricultural Policy (CAP): To ensure that the support offered is consistent with the new rules of the market and respond to new economic, environmental and territorial challenges, at the end of 2013 the European Council and Parliament reached agreement on the final version of reforms to the CAP that will be effective during the period 2014-2020. Although the new CAP is based on the same two pillars (direct payments and rural development), the reforms make support conditional on the achievement of environmental and social goals, including new measures to distribute resources more evenly among producers and rural areas, speed up the disbursement of support to small producers, and promote the incorporation of youth into agriculture. Direct payments to farmers depend on strict compliance with norms related to food security, protection of the environment, health and animal welfare (the new regime of base payments, greening, and associated voluntary help, among other items).[39] Support for rural development, on the other hand, is authorized as a market support measure only when temporary situations (e.g., climate events) destabilize a market, or to support producers' efforts to become more competitive, provided that sustainability and rural community development objectives are met (IICA, 2014).

Agricultural policy priorities in LAC

The most representative approaches of agricultural strategies and policies implemented in LAC in recent years reflect the interest of the countries in: a) making production more efficient and increasing their share of international trade in agricultural goods; b) enhancing the use of natural resources and dealing with the effects of climate change; and, c) improving the livelihoods of small farmers and rural dwellers.

39 On average, direct payments make up around 30% of farmers' incomes in the E.U. However, in countries such as Sweden, Ireland and Denmark, such support has reached a level of 60% of farmers' income (European Commission 2013).

The interdependencies among these three agricultural policy objectives have been more marked –or at least more evident– in recent years. Greater efforts are also being made to achieve stronger and closer coordination among the different dimensions of public policy. In synthesis, the main challenge for LAC agriculture is to increase competitiveness and participation in international markets with inclusive development, sustainable natural resource management, and greater adaptation to climate change, and for that reason it is not sufficient to concentrate on only one of those dimensions. This fundamental interdependence can be seen in different ways in the policies of all the countries of the region. Chile, Bolivia, Guyana, Suriname and Belize are some of the countries in which national agricultural policy is based explicitly on these three pillars of action.

The following paragraphs present summaries of the various ways in which these three broad dimensions of agricultural policy have been applied in LAC in recent years.

1. Dimension of equity and increasing smallholder incomes

Reducing poverty continues to be one of the principal challenges in rural areas of LAC. Although important efforts have been made, poverty levels continue to rise significantly, especially in countries such as Haiti and Bolivia and several Central American nations. The approaches to finding solutions to this issue in recent years have taken two forms:

- A direct approach that emphasizes strengthening human and social capital within its existing context; and,

- An indirect approach that places emphasis on changing the economic context, equivalent to assisting poor families to link themselves with actors and institutions outside their accustomed environment.

Each of these approaches is described below:

Strengthening human and social capital: The direct approach to the issue has taken the form of programs and policies directed at low-income families, with the aim of alleviating the circumstances of poverty and malnutrition, as well as meeting the basic needs of such families and including subsidies targeted at the poor. In many instances, these initiatives have emphasized improving productivity and the capacity of subsistence agriculture to recover, through the provision of agricultural inputs at low or zero cost, or equally through training and the creation of greater human capacity.

This direct approach can be seen as clearly expressed in the public policies of Antigua and Barbuda, El Salvador, Guatemala, Nicaragua, Colombia, Paraguay, Mexico, Bolivia, and Ecuador. These countries have developed instruments for improving the productive capacities of the poorest farmers, allowing them to increase their incomes and improve their livelihoods. In the cases of Bolivia, Brazil, Ecuador and Mexico, the policy also includes conditional transfer measures for the poorest families, providing incentives for them to utilize social services for health, education and nutrition. In total, 21 LAC countries are carrying out conditional transfer programs (FAO, 2013), reaching 21% of the region's total population with an average cost of scarcely 0.4% of GDP (ECLAC and ILO, 2014).

Colombia is one of the countries of the region with greatest experience in this field. Recently it launched a far-reaching campaign to improve the livelihoods of poor rural families by means of productive and social strengthening measures that include investments in decent housing, access to agricultural schools, better access to credit and a greater focus on women (Alarcón, 2014).

For this overarching objective of strengthening productive and social capital, some countries in the region are designing and implementing land tenure programs that strengthen farmers' capital endowments, not only through the documentation and registering of all existing titles or rights to property, but also through the encouragement of greater access to land as a fundamental instrument for raising the livelihoods of poor families. This last approach generally is found to be accompanied by programs of strengthening agrarian cooperatives. This is the case in countries such as El Salvador, Honduras, Guatemala, Bolivia, Colombia, Venezuela, St. Vincent and the Grenadines, and Trinidad and Tobago. In Colombia, policy is oriented toward recovering lands that remained idle after the armed conflict and putting them in the hands of poor families to restart their productive activities. In Peru, agrarian cooperatives receive support to help them become more business oriented. In Venezuela, agrarian policy is targeted at redistribution and equity, aiming to reduce the large-farm mode of tenure and production. In Trinidad and Tobago, on the other hand, the principal objectives are land titling and greater access to land for poor farmers.

Under this approach, family farming is one of the priorities in the majority of the countries of the region (Box 16). While in some countries the programs and policies have been largely focused on supporting highly vulnerable smallholders (Nicaragua and Bolivia), the most frequent programs have sought to support a transition of family holdings to more commercially-run operations through greater access to assets, knowledge and social capital (Guatemala, Brazil, Nicaragua, Colombia, Chile, Peru and Argentina, among others).

Another common way of implementing the direct approach to poverty alleviation has been working on the empowerment of rural women and the incorporation of youth and ethnic groups into productive activities and marketing, in addition to involving them in agribusiness initiatives. Although it is relatively new, this policy orientation is quite widespread and efforts along these lines have been carried out already in Belize, Costa Rica, Guatemala, Honduras, Chile, Bolivia, Colombia, Peru, St.

Box 16. A look back at the International Year of Family Farming

The international community decided to declare 2014 as the International Year of Family Farming (IYFF). The objective was not only to support the development of favorable policies for this group of farmers, but also to heighten knowledge and understanding of its characteristics, limitations and potential, all of which would serve to create synergies among international institutions and the countries that would guarantee the availability of the necessary technical support.

Although it is still yielding results, it is fair to say that the outcome of the IYFF has been very positive and encouraging. According to the United Nations Food and Agriculture Organization (FAO), in addition to making the issue more visible to all segments of society and to the decision makers in family farming (FF), the joint work carried out in 2014 has allowed the development of new legal frameworks and better public policies to address the subsector. Policies that stand out include those for strengthening productive capacities, associativity and marketing, technical assistance, access to productive resources (finance, water, land, seeds), better participation in markets, public sector purchases of FF harvests (Brazil, Ecuador and Paraguay), and support for vulnerable groups, among others.

With regard to the institutional framework, the national, regional and international efforts carried out in 2014 facilitated the incorporation of FF into the institutional matrix of the agricultural sector in at least four countries of the region (Argentina, Colombia, Paraguay and Guatemala), as well as the setting up of national commissions for FF in 18 countries. These actions created opportunities for dialogue aimed at the development of permanent public policies.

During the Forum of Latin American and Caribbean IYFF National Committees that took place in November 2014 in Brasilia, LAC countries established a series of commitments to provide follow-up to FF activities. Priority was given to the issues of market access, credit, technologies, institutional strengthening, youth and women. The Declaration of the National Committees that took part in the Forum can be consulted at: http://bit.ly/1Qtjy7f.

Vincent and the Grenadines, St. Lucia and Suriname. In Colombia, the Banco Agrario created a credit line for youth, and in Peru greater incorporation of indigenous people into decisions about their areas is being sought by bringing together indigenous groups to review and approve the regulations to the Forestry and Wildlife Act. Suriname's agricultural strategy places special emphasis on greater sharing of indigenous groups in development.

Along with the above policies, the countries of the region have stepped up their efforts to improve the working conditions of hired agricultural labor and access to social benefits (via pensions or worker and health insurance). In addition to increasing incomes and reducing the food insecurity of rural populations, policies for pensions and insurance for older farmers are designed to ensure that the youngest members of families inherit productive farming assets. Among the countries that have done most to promote policies of this kind, the case of Brazil stands out. In addition to old age pensions for family farmers (called *Previdência Rural*), there is unemployment insurance for fisherfolk that offsets the risks inherent in seasonal work and compensates them for periods during which fishing is banned in order to ensure the environmental sustainability of the resources concerned (temporary closed seasons).

Linkages between actors and institutions: The indirect approach to increasing incomes of smallholders has been implemented principally through efforts aimed at linking them with value chains, both for domestic and international markets. Support has also been provided to

initiatives for creating and sustaining small agribusinesses and entrepreneurial activities in the form of associative undertakings. Support for programs aimed at forging links with value chains is noteworthy in Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Paraguay, Peru, Dominica, Grenada, and the Dominican Republic.

Particularly outstanding among the main efforts in this area are programs aimed at the creation of farmer's markets and systems of local markets that encourage greater contact between family farmers and buyers, programs of public sector food purchases that require government institutions to obtain a share of their fresh food purchases from family farmers, programs for the promotion of linkages between smallholders and nearby restaurants and hotels, and programs for food marketing enterprises to include smallholders among their suppliers, among others.

2. Dimension of productivity and competitiveness at the sectoral level

Innovation: The LAC region's agriculture has registered greater increases in total factor productivity than that of any other region of the world (GHI, 2014). Argentina, Brazil, Chile, Peru and Mexico have increased agricultural production with the same levels of inputs (land, labor, fertilizers, machinery and livestock), an impressive achievement that reflects the fact that innovation in agriculture has been one of the main tools in this dimension (see the analysis of productivity in the chapter on the context of agriculture). Countries that place more emphasis on innovation include Belize, El Salvador, Nicaragua, Argentina, Brazil, Uruguay, Bolivia, Colombia, Costa Rica, Mexico, Peru, Venezuela, Bahamas, Dominica, Dominican Republic, St. Kitts and Nevis, St. Lucia and Suriname.

It goes without saying that innovation is vital for improving productivity and competitiveness, but the key lies in the concrete plans for promoting it. In recent years, the region has made important advances that include agricultural research through competitive funds, horizontal cooperation among countries, extension systems based on participatory methodologies, development of public-private ties for applied research, development of innovations that recover ancestral and cultural knowledge, and practical research applications for family farming.

In Peru, for example, the National Agricultural Research Institute (INIA), working with the International Potato Center (CIP), initiated state-of-the-art agricultural research aimed at developing potato varieties that are resistant to climate change. Moreover, it constantly releases new varieties of quinoa, kiwicha (amaranth), wheat, rice and other crops, which in many cases are targeted at family farmers. In Colombia, the government launched the "Plan Semilla," which aims to renew the seed varieties used for production of the 17 crops that are most important for the country's food security and smallholder agriculture. That will mean the renovation of approximately 250,000 hectares annually that are planted in staple crops. The Brazilian Agricultural Research Corporation (EMBRAPA) is conducting research on climate change mitigation and adaptation, focused on minimum tillage cropping systems and soil management, genetic screening, and the introduction of genes with resistance to high temperatures and droughts, for which it utilizes new technologies such as genomics, nanosequencing, and genetic screening. A successful example of its research on genetic improvement has been the introduction of a drought-tolerant gene in an already existing variety of soybeans (BR-16), giving rise to a new variety with better resistant to dry spells (P58). The Dominican Republic and Bolivia, on the other hand, have used horizontal cooperation as an instrument for the promotion of research on basic grains, establishing cooperation agreements with the Government of Catalonia and the International Maize and Wheat Improvement Center (CIMMYT), respectively.

Private investment: Although it has not reached a level sufficient to compensate for the fall in public investment in agriculture after government budgets were cut, it is clear that private agricultural investment has increased in recent years. Investment in machinery and equipment, in addition to foreign direct investment (FDI), has lifted the share of private investment within total agricultural investment in the region.

One of the most frequently used instruments is investment in irrigation systems (Chile, Peru, Colombia, Mexico, Dominican Republic, St. Kitts and Nevis, St. Vincent and the Grenadines, Suriname, and Trinidad and Tobago). Because of prevailing ecological and climatic conditions, investment in irrigation has increased most of all in Mexico and the Andean and Caribbean regions.

It must be acknowledged that private investment in agriculture has been boosted by increased access to agricultural finance, both for investments and for production inputs. Access to medium-term credit for investments in livestock, perennial crops, fencing, wells and other facilities has been one of the major obstacles to increases in private investment. Because farming activities are more exposed to production and climate risks than many others, financial entities classify them as highly risky, reducing the resources available to finance them. Nevertheless, in recent years various countries in the region have developed mixed schemes in which the government helps subsidize private finance for these purposes, including in some cases offers of loan insurance through State banks. Examples of such schemes can be found in Colombia, where livestock can be used as collateral for farm loans, or in Brazil, where the Banco Nacional de Desarrollo Económico y Social, together with other State banks, has established novel formulas for financing production by small farmers who use varieties and technologies generated by EMBRAPA's research.

In addition, over the last two years countries such as Costa Rica, Panama, Colombia, Nicaragua, Honduras, and Uruguay have authorized the use of fresh funds to finance agricultural projects aimed at expanding crop and pasture acreage, and projects to improve productive conditions and infrastructure. An outstanding example of this last focus is the increased financing of the renovation of coffee plantations affected by coffee leaf rust, which has included not only new credits and trust funds but also non-reimbursable transfers to farmers.

In recent years, FDI in LAC (Valoral Advisors, 2015) has been characterized principally by a greater flow of investment on the part of multinational companies for the production of crops for domestic markets; greater participation by state-owned enterprises of countries outside the region (especially Asian and Middle Eastern nations) seeking to satisfy domestic demand for products such as soybeans, sugar, white meats, forest products, livestock and fruit; and larger flows of investments from other LAC region countries (especially Brazil and Argentina). In addition, in the specific case of Central America there has been a significant increase in FDI for tropical export crops such as sugar, palm oil, citrus fruits and bananas.

Risk management: With increasing frequency, the design of agricultural policies in the countries of the region is based on the concept of comprehensive risk management. In this context, crop insurance is the most widely disseminated instrument (IICA, 2012). Although Mexico was the pioneer and has been the region's leader on this topic, there are other countries that have made rapid progress, motivated above all by the climate and health risks faced by their crops and livestock. In this group of countries, Uruguay, Chile, El Salvador, and Costa Rica stand out. As is the case in the US and the EU, most of these insurance schemes receive government support to cover the cost of premiums. In Chile, for example, the Ministry of Agriculture's AgroSeguro program

has three types of insurance or coverage for vegetables, fruit, cereals, oilseeds and livestock products, with the State subsidizing 50% of the premium (MINAGRI, 2014). In the case of Costa Rica, the crop insurance model was modified recently to speed up its adoption. Differentiated rates were established, along with collective insurance options that can lead to discounts of up to 35% of the premiums (MAG, 2015).

With regard to insurance for crop losses, the general pattern is that LAC countries do not have insurance against variations in farm incomes, since they do not have reference markets such as futures markets. One of the main exceptions is Mexico, which recently developed a new model for managing the income risks faced by the poorest farmers in the face of declines in world grain prices that uses the coverage instruments of national development banks and contract agriculture programs (Hernández, 2014).

International trade: In recent years, various countries in the region have established support programs for producers, taking advantage of the fact that they are increasing their participation

Box 17. Programs for the development of value chains and successful participation in international markets

LAC has a wide range of successful programs that promote linkages of agricultural and rural producers to national and international value chains. Because of their achievements, the programs of Costa Rica and Peru stand out:

The Promotora de Comercio Exterior (PROCOMER) is a Costa Rican institution that has been working for more than ten years on the promotion of international trade for that country. Besides heading up the Comisión Interinstitucional de Encadenamiento para la Exportación (whose members include other public and private institutions), PROCOMER carries out training for local producers, striving to ensure that their production, packaging and labeling processes respond to the needs of the users of their products. In some cases, it also helps develop an entrepreneurial vision with producer organizations. The institution complements this work by helping to identify potential markets and buyers, accompanying producers in value chain fairs and in their marketing promotion, and provides follow-up to commercial negotiations and agreements, etc. The development of this model was based on identification of the best practices of other countries such as Singapore, Mexico, the Czech Republic and South Korea (PROCOMER, 2014). As a result of this effort, in 2013 PROCOMER was categorized by the Centre for International Trade as a global benchmark institution for topics such as leadership, measurement and results, resources and processes, and the provision of services and products, giving it a score of 92.39% (the highest ever awarded).

Peru's national Sierra Exportadora program is another initiative in the region that has generated successful results in the development of several agricultural value chains, for both the domestic and international markets. To fulfill its objectives, Sierra Exportadora has tools to promote and develop business plans, projects for production and rural infrastructure, training programs, associative enterprises and the adoption of new technologies. In light of the economic activities present in the area, the principal sectors supported are agriculture, agroindustry, livestock, aquaculture, handicrafts, textiles, jewelry making, reforestation, agroforestry and tourism in the Andes. As an outcome of these efforts, in 2014 Sierra Exportadora supported exports worth USD 106 million (an increase of 78% over 2013), for which it stimulated the development of 321 business plans and benefitted 78,000 Peruvians (El Comercio, 2015). With a view to better coordinating this successful program with the public sector's institutional structure for agriculture and with the National Agrarian Policy, in 2015 Sierra Exportadora became affiliated with the Ministry of Agriculture and Irrigation.

in international markets. Some cases in point are Brazil, Paraguay, Uruguay, Dominica, Colombia, Costa Rica, Peru, Jamaica, and St. Vincent and the Grenadines, among others.

The Caribbean is one of the LAC regions that has done most to promote its agricultural exports, mainly for tropical fruits and other specialized niche products. Examples include soursop, cocoa and nutmeg in Grenada; fish in Guyana; mangos in Haiti; meat, dairy products and vegetables in the Dominican Republic; food products in Jamaica; chili peppers in Trinidad and Tobago; and, vegetables for the regional Caribbean market grown in St. Kitts and Nevis. In Caribbean intraregional trade, St. Vincent and the Grenadines is positioned as principal exporter to the Southern Caribbean, especially of root and tuber crops and vegetables.

3. *Dimension of environmental sustainability*

Although most of the topics in this policy area fall outside their remit, the region's agricultural sector authorities are showing more and more concern for sound management of natural resources. The impact of climate variability and temperatures on crop yields, added to the effects of environmental degradation, soil erosion and lesser availability of water, have made environmental sustainability one of the priorities of agricultural policies.

Due to their high exposure to climate events, in the last two years Mexico and the Central American countries have established specific programs for adaptation of their corn and bean varieties to the new temperature and precipitation conditions, especially given the importance of these crops in the diets of those countries. Other countries in the Southern and Andean regions also have programs for climate change adaptation and mitigation, for livestock as well as crops.

The emphasis on the sustainable use of natural resources and the creation of conditions favorable to sustainable agricultural production is particularly noticeable in the plans and policies of Belize, Costa Rica, Guatemala, Nicaragua, Honduras, Colombia, Argentina, Uruguay, Brazil, Paraguay, Chile, Mexico, Bolivia, Ecuador, Haiti, Jamaica, St. Kitts and Nevis, and St. Vincent and the Grenadines. In Uruguay, for example, a pilot plan was put into effect in 2015 for soil management in the dairy sector to "control erosion and manage the effluents of dairy farms as an input for improving the production process and efficiency" (Silva, 2015). This year, the Ministry of Agriculture of Colombia announced that part of the agricultural portfolio was to be set aside for reforestation and protection of water sources and the environment. In El Salvador, the Ministry of Agriculture and Livestock, together with the Banco de Fomento Agrícola, established a credit line to promote organic agriculture, with an eye to reducing soil and water contamination and increasing the value of production.

Policy recommendations

The development of mutually complementary policies and sectoral strategies

The other chapters of this document that deal with specific subsectors offer policy recommendations for the subsector concerned. This chapter, however, focuses on recommendations with comprehensive and mutually reinforcing approaches for two or more sectors.

Although the region has advanced in the development and implementation of sectoral policies for each of the three policy dimensions described above, there are still major challenges with regard to competitiveness, as well as equity and sustainability. The most urgent tasks that need to be implemented in the short run to tackle them are as follows:

Strengthening physical capital of family farmers: The strengthening of the physical capital of farmers begins not only with better access to land but also the development of the conditions necessary for increasing their productivity. Recent experience in LAC suggests that the programs focused on access to land or land tenure reforms should be based not only on transparent criteria for land distribution and productivity concepts without policy or partisan objectives, but also on respect for farmers' wishes with respect to the type of associative arrangement used to divide up land. As complements to access to land, the strengthening of physical capital endowments calls for greater access for family farmers to financing for investment in their production units, more State involvement as the facilitator of innovation and greater support for the development of the productive infrastructure (mainly for irrigation).

Strengthening social protection mechanisms for the rural population and family farming: Although during the last two decades LAC countries have made major efforts to incorporate rural dwellers into social security and assistance programs, important gaps in coverage remain, and there has been little adaptation of the benefit schemes to the realities of the countryside. In addition to expanding rural coverage, the social protection systems face three main challenges:

1. Expanding social assistance by strengthening inclusion of the labor of beneficiaries and recognizing their productive efforts, utilizing for this purpose mechanisms for training, raising of levels of schooling, and support for independent work (especially family farming), among others.

2. Increasing social security benefits by strengthening mechanisms for contributions or partial contributions for pensions, and offering insurance for unemployment, health and other risks for family farmers.

3. Encouraging decent working conditions by eliminating forms of child labor, guaranteeing safe working conditions, and respecting key institutions of the labor market (minimum wages, formal contracts, and collective bargaining) for wage-earning workers in agriculture, livestock, forestry and fisheries in LAC.

Increase access to finance for farming: One of the big problems facing agriculture at present is the absence of risk capital that could encourage the growth of small agro-enterprises. Although some innovative experimental efforts are being tried out in countries such as Kenya, Uganda and Tanzania (Brett, 2012), progress has been patchy. The tendency in most LAC countries has been to create State agricultural banks with stiff requirements for credit or, in their absence, to subsidize interest rates for private agricultural credit, which has not only made access to funds difficult for family farmers but also not facilitated efficient use of funds.

Some viable options for governments include:

a. Recognizing that agricultural finance is risky and establishing funds for non-reimbursable risk capital with an institutional architecture for review and approval of proposals, as was done in Panama under the PROCOMPETITIVIDAD program funded by the Inter-American Development Bank (IDB).

b. Modifying bank supervision regimes for agricultural loan portfolios so they are consistent with the actual conditions in rural areas, including the impossibility of evaluating portfolio risk before harvests come in.

c. Subsidizing agricultural loans given by commercial banks, as a way of reducing risk for the banks, as is done in Chile.

d. Strengthening crop insurance models so farmers can become more attractive clients for commercial banks, following the examples in Mexico.

Strengthen innovation for family farming: It is important to clarify that the State does not always have to manage innovation for family farming directly. Some countries have achieved very successful results utilizing models in which the State's main role is to bring together all the actors involved (governmental institutions, private enterprises, farmers, international institutions, universities, research centers, etc.), encourage interactions, and create networks; and to finance the initial research, regardless of who carries it out. A case in point is the model of competitive research funds in Chile. One of the factors that make these models successful is that the research agendas are put together with the active participation of all the actors in the innovation system, mainly the producers themselves, so they reflect the true needs of the sector. This does not take away from the results achieved by other countries using different models.

Increase public infrastructure in rural areas: LAC is one of the regions where there is still new land available for incorporation into agricultural production, but this can only be achieved with increased rural investment in the construction of access roads and bridges, telecommunications, watershed protection zones, and water capture structures, among others. Better productive infrastructure and ease of access to markets improves the competitiveness of family farmers, not only reducing their costs and time, but also permitting them to obtain higher profits from their outputs. In addition, better public infrastructure facilitates higher living standards for the rest of the rural population.[40]

Strengthen the links between family farmers and markets and value chains: As was highlighted in a previous edition of this document (ECLAC-FAO-IICA, 2013), greater integration of family farmers into value chains allows them to become linked to markets that offer greater value added, which not only increases the prices paid for their products but also enables them to enter into more reliable and stable commercial relationships. To achieve this the countries have at their disposal strategies that range from increasing product quality standards for family farms, so they can satisfy the requirements of large commercial food chains, to the encouragement of short food supply chains in which buyers value the production and social-environmental characteristics of the goods produced by family farms.

Encourage the management of climate risks: It is vital that the countries develop strategies for prevention and mitigation of the effects of climate variability on farmers, especially on family farmers and, above all, at a time when big changes in temperature, precipitation and humidity are forecast as a consequence of El Niño. Such strategies should be comprehensive, including preventive measures such as research for the development of new varieties resistant to climate change or the construction of supporting infrastructure (irrigation, for example), and extending to measures to mitigate impacts or redress damages for those who are affected, such as risk management instruments (insurance against climate risk, subsidies on premiums, credit lines, etc.), subsidies for the affected populations, or market measures to soften domestic prices when there are shortages (such as reducing import tariffs, creating contingent import arrangements, etc.).

Promote decentralization of the management of public policies: Regional and local governments should work more closely with the target population for public policy, so that the latter responds more fully to the needs of farmers and rural dwellers. This calls for efforts to decentralize both the management of policies and the delivery and management of the services offered by government (marketing, technical assistance, information, etc.). For the purposes of decentralization, the coverage of laws needs to be extended and the roles of federal (central), provincial (departmental) and

40 The powerful, positive effect on rural incomes of investments in rural roads was well documented in the study by Webb (2013).

territorial (local) governments redefined. Only then will it be possible to facilitate the vertical integration of public sector institutions and promote joint responsibilities in the design, implementation, monitoring and evaluation of policies. The main challenge is to foster active and effective participation, learning through experience, and the development of a shared vision among different levels of government and local actors. LAC has interesting examples of decentralized joint management, such as the municipal units for agricultural technical assistance (UMATA) in Colombia, the PRONAF rural credit program in Brazil, and the Wawa Wasi Program of the Ministry of Development and Social Inclusion in Peru. On the other hand, Canada is an example of the legal framework needed for decentralization of policies and budgets to provincial and local governments: the provincial and federal ministers of agriculture work with organized groups in the agricultural sector to design and implement policy.

The participatory approach: Widespread participation in the implementation and not only the development of policies makes programs and strategies more effective, in addition to improving their execution and sustainability over time. Given the intersectoral nature of agriculture, such processes in the sector should involve entities at various levels, ranging from national and regional governments to international organizations, private enterprises, cooperatives, smallholders, and consumers, among others. Forums for participation not only open the way for the incorporation of new perspectives about the sector's needs, but also offer opportunities for finding new routes to solutions.

With this objective in mind, participatory approaches are gaining acceptance in policies for both agriculture and rural development. The Central American Strategy for Rural Area-based Development 2010–2030 (ECADERT), as well as the agricultural policies of El Salvador and Guatemala, are clear examples of planning processes that are structured in a participatory manner, especially in some priority zones of those countries. Other countries that have placed emphasis on the use of similar approaches include Belize, Nicaragua, Peru, and St. Vincent and the Grenadines.

In addition to being applied in the fields of research and extension, as noted previously, the participatory approach has been used successfully to build value chains in Mexico, Chile, Colombia, and other countries of the region.

Box 18. Do ministries of agriculture have enough resources to address all these urgent needs?

Despite the inclusion of new objectives in agricultural policy and the fact that the contribution of agricultural growth to rural poverty alleviation was demonstrated years ago (Timmer, 1997 and Mellor, 2000), government spending on agriculture has not increased in real terms over the last decade in most LAC countries; in fact, in many cases it has been cut. According to data compiled by FAO (FAOSTAT), the percentage of public sector spending on agriculture in Latin America rose from 2% in 2001 to 2.5% in 2010, but then fell sharply, to 1.5%, in 2012, and apparently has not recovered since then.

A great many authors have studied the links between agricultural growth and its positive effects on the rest of the economy, but it is clear that the proportion of public spending allocated to agriculture does not reflect the latter's true importance. According to FAO's Agriculture Orientation Index (AOI), seven LAC countries (El Salvador, Guatemala, Argentina, Jamaica, Panama, Chile and Costa Rica) spend much less on agriculture as a percentage of public outlays than the sector's percentage contribution to total GDP, showing that fiscal policy does not place emphasis on agriculture (FAO, 2012). The highest values of the ratio of these two percentages, although always below one, were calculated for Chile and Costa Rica, and the lowest for El Salvador, Guatemala and Argentina.

Interinstitutional coordination and the participatory approach

In addition to focusing policy on the pursuit of competitiveness, equity and agricultural sustainability, it is imperative that LAC countries reform their public-sector institutional framework for agriculture to promote greater interinstitutional coordination and encourage participatory approaches in decision making.

Interinstitutional coordination: In contrast to the role traditionally played by ministries of agriculture, when they carried out centralized activities designed to promote primary production and a certain degree of coordination of the links of value chains, today they need to facilitate transformations of the sector. Public sector institutions should promote innovation, processing and agribusiness through the provision of public goods (including incentives) and the coordination of the diverse parts of national institutional structures, including public institutions, private enterprises, international organizations, financial institutions, and NGOs, among others.

Given the complexity and intersectoral character of agriculture, this interinstitutional coordination role is more challenging than in many other sectors of the economy. As a result, the institution in charge requires special capacities if it is carry it out effectively. Achieving complementary objectives in the productive, environmental and social areas requires permanent coordination with institutions devoted to the economy, infrastructure, health, natural resources, education, etc. A typical way to make State institutions function more efficiently is to give them operational autonomy. Classic examples include agricultural research institutions and sanitary and phytosanitary authorities. Perhaps the most outstanding example of this institutional policy is the approach adopted in Brazil by EMBRAPA. Other cases in point are institutions that have applied the approach in other fields, such as watershed management (Corporaciones de Cuencas in Colombia and the Comisión de la Cuenca Hidrográfica del Canal de Panamá), and forestry management (the Corporación Nacional Forestal de Chile, for example).

Despite the increase in institutional autonomy, close interinstitutional coordination is still difficult to achieve. Recently, the intersectoral coordination of government agencies has been included in strategies in Costa Rica, Nicaragua, Guatemala, Bolivia, Ecuador, Peru and the Dominican Republic. Effective operational formulas for such coordination continue to be rare, however.

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Statistical Appendix

Table A1. Global growth projections
Annual rate of GDP growth, in real terms, by country group

Countries	IMF				
	2012	2013	2014	2015	2016
World	3.4	3.4	3.4	3.5	3.8
Advanced economies	1.2	1.4	1.8	2.4	2.4
United States	2.3	2.2	2.4	3.1	3.1
Euro Zone	-0.7	-0.5	0.9	1.5	1.6
Emerging economies	5.1	5.0	4.6	4.3	4.7
China	7.7	7.8	7.4	6.8	6.3
Latin America & the Caribbean		2.9	1.3	0.9	2.0
Countries	**World Bank**				
	2012	2013	2014	2015	2016
World		2.5	2.6	2.8	3.3
Advanced economies		1.4	1.8	2.0	2.4
United States		2.2	2.4	2.7	2.8
Euro Zone	-0.7	-0.4	0.9	1.5	1.8
Developing countries	4.9	5.1	4.6	4.4	5.2
China	7.7	7.7	7.4	7.1	7.0
Latin America & the Caribbean	2.9	2.7	0.9	0.4	2.0
Countries	**DAES - United Nations**				
	2012	2013	2014	2015	2016
World		2.5	2.6	2.8	3.1
World (PPP /a)	2.9	3.1	3.2	3.4	3.7
Advanced economies		1.2	1.6	2.2	2.2
United States		2.2	2.4	2.8	2.7
Euro Zone	-0.8	-0.4	0.9	1.6	1.9
Developing countries		4.7	4.4	4.4	4.8
China	7.7	7.7	7.4	7.0	6.8
Latin America & the Caribbean	2.7	2.7	1.0	0.5	1.7

[a] Purchasing power parity

Source: IMF, World Economic Outlook April 2015, World Bank, Global Economic Prospects June 2015, DAES-UN, World Economic Situation and Prospects Update mid-2015.

Table A2. Growth Projections in the Americas
Annual rate of GDP growth, in real terms, by country

Countries	ECLAC					IMF					
	2011	2012	2013	2014[a]	2015[b]	2011	2012	2013	2014[a]	2015[b]	2016[b]
Antigua & Barbuda		4.0	-0.1	3.2	5.4	-1.9	3.6	1.8	2.4	1.9	2.3
Argentina	8.4	0.8	2.9	0.5	0.7	8.4	0.8	2.9	0.5	-0.3	0.1
Bahamas	0.6	2.2	0.0	1.0	2.0	1.1	1.0	0.7	1.3	2.3	2.8
Barbados	0.8	0.3	-0.1	0.2	1.5	0.8	0.0	0.0	-0.3	0.8	1.4
Belize	2.1	3.8	1.5	3.4	2.5	2.1	3.3	1.5	3.4	2.0	3.0
Bolivia (Plurinational State of)	5.2	5.2	6.8	5.4	4.5	5.2	5.2	6.8	5.4	4.3	4.3
Brazil	3.9	1.8	2.7	0.1	-1.5	3.9	1.8	2.7	0.1	-1.0	1.0
Canada	5.8	5.5	4.2	1.9	2.5	5.8	5.5	4.3	1.8	2.7	3.3
Chile	6.6	4.0	4.9	4.6	3.4	6.6	4.0	4.9	4.6	3.4	3.7
Colombia	4.5	5.2	3.4	3.5	3.4	4.5	5.2	3.4	3.5	3.8	4.4
Costa Rica	2.8	3.0	2.7	1.3	4.0	--	--	--	--	--	--
Cuba	-0.1	-1.4	-0.9	2.4	0.9	-0.1	-1.4	-0.9	1.1	2.4	2.9
Dominica	7.9	5.2	4.6	3.8	1.9	7.9	5.2	4.6	3.6	1.9	3.6
Dominican Republic	2.2	1.9	1.8	2.0	2.2	2.2	1.9	1.7	2.0	2.5	2.6
Ecuador	0.8	-1.2	2.4	3.8	1.3	0.8	-1.2	2.4	1.5	1.5	2.0
El Salvador	4.2	3.0	3.7	4.2	4.0	4.2	3.0	3.7	4.0	4.0	3.9
Grenada	5.4	4.8	5.2	3.9	4.5	5.4	4.8	5.2	3.8	3.8	4.4
Guatemala	5.5	2.9	4.2	2.8	2.5	5.5	2.9	4.2	2.8	3.3	3.8
Guyana	3.8	4.1	2.8	3.1	3.0	3.8	4.1	2.8	3.1	3.3	3.4
Haiti	1.7	-0.6	0.6	0.4	1.1	1.4	-0.5	0.2	0.5	1.7	2.3
Honduras	3.9	4.0	1.4	2.1	2.4	4.0	4.0	1.4	2.1	3.0	3.3
Jamaica	6.2	5.1	4.5	4.7	4.8	6.2	5.0	4.4	4.5	4.6	4.3
Mexico		10.2	8.4	6.2	6.0	10.8	10.7	8.4	6.2	6.1	6.4
Nicaragua3	4.3	-1.2	14.2	4.4	4.0	4.3	-1.2	14.2	4.4	4.0	4.0
Panama	6.5	6.0	5.8	2.4	3.6	6.5	6.0	5.8	2.4	3.8	5.0
Paraguay	2.8	2.6	4.8	7.3	4.8	2.8	2.6	4.8	7.3	5.1	4.5
Peru	1.7	-1.2	3.7	6.3	4.6	-1.9	-0.9	3.8	7.0	3.5	3.0
Saint Kitts & Nevis	-0.5	1.2	1.8	-0.3	0.8	0.2	1.1	2.4	1.1	2.1	3.1
Saint Lucia	1.2	-1.6	-0.4	-1.6	0.3	1.3	0.6	-0.5	-1.1	1.8	1.4
Saint Vincent & the Grenadines	5.3	3.0	2.9	3.4	3.0	5.3	4.8	4.1	2.9	2.7	3.8
Suriname	0.0	1.4	1.7	0.9	1.0	0.0	1.4	1.7	1.1	1.2	1.5
Trinidad & Tobago	5.2	3.3	5.1	3.5	2.6	7.3	3.7	4.4	3.3	2.8	2.9
United States	4.2	5.6	1.3	-4.0	-5.5	4.2	5.6	1.3	-4.0	-7.0	-4.0
Uruguay	--	--	--	--	--	3.0	1.9	2.0	2.5	2.2	2.0
Venezuela (Bolivarian Rep. of)	--	--	--	--	--	1.6	2.3	2.2	2.4	3.1	3.1
Latin America and the Caribbean		2.6	2.5	1.1	1.0	4.9	3.1	2.9	1.3	0.9	2.0

[a] Estimations.
[b] Projection.

Source: CECLAC (Economic Commission for Latin America & the Caribbean): Economic Survey of Latin America and the Caribbean 2015, Press release (July). IMF: International Monetary Fund, World Economic Outlook Database, April 2015.

Table A3. Inflation, purchasing power of exports & foreign direct investment

Countries	Consumer price index (average rates of annual variation)								Purchasing power of exports of goods & services (2005=100)			Foreign direct investment, net (millions of us$)		
	General				Food									
	2011	2012	2013	2014	2011	2012	2013	2014	2012	2013	2014	2012	2013	2014[a]
Antigua & Barbuda			1,1	1,1	4,6	4,2	2,5	--	--	--	--	133,1	94,7	161,0
Argentina		10,0	10,6	21,4	8,7	10,3	7,5	16,5	110,8	107,0	94,9	14 269,0	10 204,0	4495,0
Bahamas		2,0	0,3	1,2	2,2	2,5	0,7	2,2	--	--	--	526,2	388,0	259,0
Barbados		4,5	1,8	1,9	8,2	7,0	2,8	0,2	--	--	--	426,4	--	--
Belize		1,3	0,5	1,0	--	--	--	--	--	--	--	193,0	92,0	138,0
Bolivia (Plurinational State of)			5,8	5,8	14,0	4,1	7,7	6,7	157,4	163,6	175,0	1060,0	1749,6	648,0
Brazil		5,4	6,2	6,3	8,8	8,1	11,2	6,5	107,8	107,8	103,0	68 093,3	67 491,0	66 035,0
Chile			1,9	4,7	6,9	7,5	5,2	5,3	100,6	100,8	99,3	7902,0	8956,0	9950,0
Colombia		3,2	2,0	2,9	4,7	4,1	1,3	2,6	133,6	132,0	128,0	15 646,0	8547,0	12 155,0
Costa Rica		4,5	5,2	4,5	5,7	4,7	4,1	3,3	101,0	106,8	111,1	1915,0	2474,0	1838,0
Cuba		1,9	0,6	1,1	--	--	--	--	--	--	--	--	--	--
Dominica		1,4	-0,4	0,9	0,5	2,8	0,8	--	--	--	--	28,9	24,2	33,0
Dominican Republic			2,7	3,6	6,6	6,4	2,2	4,1	122,8	130,8	139,3	584,6	731,0	774,0
Ecuador		1,7	0,8	1,1	6,8	0,3	2,4	2,3	112,2	118,5	121,0	483,6	176,0	274,0
El Salvador			0,0	-1,0	4,4	3,0	0,9	--	--	--	--	31,5	113,1	40,0
Grenada		3,8	4,3	3,4	11,1	7,1	8,3	5,6	104,1	107,1	117,8	1205,4	1262,0	1365,0
Guatemala		2,4	1,9	1,0	--	--	--	--	--	--	--	278,0	201,0	0,0
Guyana		6,3	5,9	4,6	10,2	6,6	6,5	2,9	106,1	123,6	130,8	156,0	160,0	99,0
Haiti		5,2	5,2	6,1	6,0	3,1	5,2	5,6	114,7	109,6	115,6	851,0	991,6	1120,0
Honduras		6,9	9,4	8,3	7,7	10,8	12,5	3,9	--	--	--	411,0	741,0	701,0
Jamaica			3,8	4,0	5,1	7,6	5,2	3,9	115,2	119,2	123,7	-3519,0	31 488,0	17 594,0
Mexico			7,1	6,0	9,4	8,9	9,0	6,1	125,4	124,3	139,3	715,0	708,0	756,0
Nicaragua		5,7	4,0	2,6	5,9	8,1	5,8	3,3	134,5	129,8	128,0	3254,0	4372,7	4351,0
Panama		3,7	2,7	5,0	13,4	-0,6	3,3	6,4	101,1	118,5	116,4	738,0	72,0	238,0
Paraguay		3,7	2,8	3,2	4,9	5,6	3,3	2,9	118,4	109,9	103,6	11 840,1	9160,9	7789,0
Peru		3,7	4,8	3,0	8,7	5,1	5,3	2,8	108,3	115,8	126,8	3142,4	1990,3	2209,0
Saint Kitts & Nevis			0,8	1,1	9,5	3,0	2,6	--	--	--	--	108,4	136,2	118,0
Saint Lucia			0,8	0,2	3,5	3,3	2,0	--	--	--	--	115,1	159,6	138,0
Saint Vincent & the Grenadines			1,5	3,5	2,7	6,5	5,0	--	--	--	--	73,6	92,0	73,0
Suriname			1,9	3,4	--	--	--	--	--	--	--	128,0	138,4	4,0
Trinidad & Tobago			5,2	5,7	9,8	19,1	8,7	3,3	--	--	--	772,1	-66,0	339,0
Uruguay		8,1	8,6	8,9	9,7	8,7	9,6	8,1	111,9	111,8	114,7	2539,0	3027,0	2741,0
Venezuela (Bolivarian Rep. of)	26,1	21,1	40,6	61,9	29,9	24,8	54,2	46,9	135,1	123,5	103,3	756,0	4888,0	1000,0

[a] Preliminary data

Source: CEPAL: ECLAC (Economic Commission for Latin America & the Caribbean): Economic Survey of Latin America and the Caribbean 2015 and estimations based on official sources, information revised as of July 2015.

Table A4. Gross domestic product & agriculture value added

Countries	Gross Domestic Product per capita (constant 2010 dollars per capita)				Agriculture, livestock, hunting, forestry & fishing as a proportion of total Value Added (%)				Annual variation of value added in the agriculture, livestock, hunting, forestry & fishing sector (%)			
	2011	2012	2013	2014	2011	2012	2013	2014	2011	2012	2013	2014
Antigua & Barbuda	12 651	13 024	12 882	13 163	1.9	1.9	1.9	1.9	13.6	2.4	3.2	0.6
Argentina	12 371	12 363	12 611	12 564	6.3	5.7	6.2	6.4	-3.5	-8.3	10.4	4.2
Bahamas	21 724	21 869	21 560	21 485	2.0	2.0	1.5	1.5	-7.9	4.5	-23.9	-0.6
Barbados	15 895	15 863	15 775	15 722	1.2	1.2	1.3	1.2	-6.3	2.8	2.8	-2.6
Belize	4510	4 570	4 530	4 576	10.8	11.1	11.5	12.1	-4.3	6.8	5.6	8.3
Bolivia (Plurinational State of)	2037	2111	2221	2308	10.2	10.1	9.9	10.5	3.1	4.1	4.7	12.1
Brazil	11 666	11 775	12 003	11 931	4.2	4.0	4.2	4.2	5.6	-2.5	7.9	0.4
Chile	13 306	13 911	14 376	14 529	3.4	3.1	3.0	3.0	11.8	-2.2	-0.3	2.8
Colombia	6496	6668	6905	7126	6.2	6.1	6.2	6.1	2.1	2.5	6.7	2.3
Costa Rica		8317	8492	8682	6.3	6.3	6.1	6.1	0.6	5.0	-0.3	3.7
Cuba	5854	6032	6199	6282	3.7	3.6	3.7	--	4.4	0.7	4.7	na
Dominica	6 899	6776	6686	6813	12.3	13.5	13.9	14.1	7.3	7.8	2.0	4.3
Dominican Republic	4915	5088	5239	5353	9.7	9.3	9.4	9.3	7.9	0.8	5.6	2.8
Ecuador	3502	3547	3591	3639	11.0	11.2	11.0	10.9	-2.5	3.5	-0.4	1.6
El Salvador	7394	7280	7427	7682	4.4	4.6	4.9	5.5	-1.6	4.1	8.4	16.6
Grenada	2932	2946	2982	3035	11.1	11.4	11.5	11.4	5.0	4.9	4.7	3.6
Guatemala		3139	3286	3398	17.8	17.6	17.2	17.5	2.7	3.7	2.3	5.9
Guyana	707	719	740	751	--	--	--	--	--	--	--	--
Haiti	2117	2162	2180	2206	11.9	12.6	12.7	12.7	6.5	10.7	3.4	2.7
Honduras	4886	4833	4834	4828	5.9	6.0	6.0	na	10.3	2.3	-0.7	--
Jamaica	9353	9619	9649	9747	2.9	3.0	3.1	3.1	-6.1	8.3	2.6	3.6
Mexico	1576	1633	1682	1736	16.8	15.8	15.2	15.2	4.8	-1.3	1.1	4.4
Nicaragua	8538	9257	9866	10 307	3.1	3.0	2.8	2.7	1.3	4.7	3.5	2.6
Panama	3185	3095	3479	3575	20.3	16.4	20.3	20.2	3.7	-19.8	41.2	3.9
Paraguay	5288	5539	5790	5861	7.0	6.7	6.5	6.4	8.0	1.6	2.7	1.4
Peru	5498	5571	5766	6115	6.2	6.3	6.2	6.0	6.5	2.9	3.7	4.4
Saint Kitts & Nevis	13 294	12 981	13 316	14 007	1.6	1.4	1.5	1.4	11.4	-9.4	6.4	-1.2
Saint Lucia	6200	6271	6385	6404	6.1	6.1	6.4	6.4	-0.2	1.0	6.4	1.5
Saint Vincent & the Grenadines	7027	6854	6772	6615	2.2	2.5	2.6	2.4	-11.8	13.5	0.3	-8.7
Suriname	8680	8862	9037	9264	9.6	10.3	9.1	9.1	4.3	10.1	-8.9	3.6
Trinidad & Tobago	15 782	15 946	16 178	16 286	0.6	0.5	0.5	0.5	-0.1	-19.1	5.1	-0.2
Uruguay	12 519	12 893	13 505	13 929	7.8	7.5	7.5	7.4	13.2	-0.5	4.9	2.1
Venezuela (Bolivarian Rep. of)	8464	8806	8793	8320	5.1	4.9	4.9	4.8	-1.1	2.3	-0.4	-5.1
Latin America and the Caribbean		9147	9310	9319	4.7	4.5	4.7	4.6	2.3	-0.6	6.2	1.8
Latin America	8990	9153	9316	9325	4.7	4.5	4.7	4.7	2.3	-0.6	6.3	1.8
Caribbean		8695	8749	8802	3.9	4.0	3.8	2.6	3.6	3.5	-2.2	3.9

Source: ECLAC (Economic Commission for Latin America & the Caribbean): Own estimations based on official sources, information revised as of August 2015.

Table A5. Agricultural & rural employment

Countries[1]	Proportion occupied population in agriculture[2]		Labour insertion of the economically active population in rural area[3,4,5] (percentages)											
	Percentage of the population occupied		Employers		Salaried agriculture		Salaried non-agriculture		Own account agriculture		Own account non-agriculture		Inactive	
	2000	2012[5]	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012	2000	2012
Bolivia (02-09)	36.8	31.6	9.3	8.0	5.9	5.3	8.5	16.0	62.7	55.3	7.0	8.0	6.6	7.4
Brazil (01-12)	19.7	14.2	4.5	2.3	21.7	16.7	12.3	14.8	36.4	25.2	5.8	7.2	19.2	33.9
Chile (00-11)	13.0	9.7	2.6	1.8	30.5	21.5	13.3	20.4	17.6	10.7	5.1	8.4	30.8	37.3
Colombia (02-12)	20.3	17.1	6.6	7.1	22.7	21.7	10.7	9.7	28.1	31.2	12.6	13.4	19.2	17.0
Costa Rica (02-12)	19.4	13.5	8.3	3.4	16.8	17.8	29.7	31.3	11.5	8.8	11.9	10.9	21.7	27.8
El Salvador (01-12)	20.7	20.7	5.7	4.7	15.2	15.8	17.3	20.5	22.5	20.1	12.0	11.8	27.0	27.1
Honduras (02-10)	35.7	36.2	1.7	1.1	14.5	12.3	11.7	11.0	45.6	43.3	10.7	15.0	15.8	17.3
Mexico (02-12)	17.5	15.5	7.1	17.8	17.8	12.6	25.7	32.6	18.9	11.4	12.0	7.4	18.6	18.2
Nicaragua (01-09)	32.4	33.5	10.1	1.8	15.9	15.6	14.1	12.4	34.2	44.4	8.0	8.8	17.8	16.7
Panama (02-11)	21.1	16.7	2.5	2.5	12.8	11.5	18.3	20.6	33.5	28.8	13.5	12.1	19.4	24.6
Paraguay (00-11)	30.8	25.5	6.1	5.2	8.2	7.6	16.4	18.1	43.3	36.3	10.8	12.7	15.2	20.1
Dominican Republic (02-12)	16.6	13.6	2.1	2.5	5.7	5.1	16.8	21.5	31.7	23.0	18.4	21.6	25.4	26.4

[1] In parentheses, period available by country.
[2] ECLAC, Statistical Yearbook 2013 and 2014 .
[3] ECLAC, calculated from household surveys.
[4] Reference age of 15 years for the EAP.
Source: Year closest to the head of the column.

Table A6. Poverty, extreme poverty & median incomes

Countries	Incidence of poverty and extreme poverty (18 countries) (percentages)							
	Total Poverty		Poverty in Rural Areas		Total Extreme Poverty		Extreme Poverty in Rural Areas	
	2000	2012	2000	2012	2000	2012	2000	2012
Argentina		--	--	--	--	--	--	--
Bolivia (Plurinational State of)	63.7	36.3	83.4	55.4	38.8	18.7	69.0	38.1
Brazil	37.5	18.0	55.2	31.1	13.2	5.9	28.0	13.6
Chile	20.2	7.8	23.7	6.7	5.6	2.5	8.4	2.8
Colombia		30.7	61.2	42.8	17.8	9.1	33.0	19.2
Cost Rica	20.3	17.7	24.4	19.5	7.8	7.2	11.1	9.6
Dominican Republic	61.6	33.6	65.7	33.7	31.8	12.0	39.4	14.3
Ecuador	47.9	40.9	62.3	48.7	21.0	12.5	33.5	17.5
El Salvador		54.8	68.0	66.5	30.9	29.1	37.6	42.2
Guatemala		69.2	83.5	79.5	52.8	45.6	66.3	61.4
Honduras	41.1	37.1	54.7	43.5	15.2	14.2	28.5	21.5
Mexico	69.4	58.3	77.1	65.4	42.5	29.5	55.2	40.9
Nicaragua	36.9	23.2	55.2	44.6	19.4	12.2	35.5	29.3
Panama	59.7	40.7	70.9	48.8	31.3	19.2	46.3	29.7
Paraguay	54.7	23.9	78.4	48.0	24.4	4.7	51.3	16.0
Peru	47.1	40.7	55.9	44.7	20.7	20.2	28.6	24.2
Uruguay	--	5.6	--	2.0	--	0.9	--	0.3
Venezuela (Bolivarian Rep. of)	44.0	32.1	--	--	18.0	9.8	--	--
Latin America	43.9	28.1	62.4	47.9	19.3	11.7	38.4	28.2

Source: ECLAC, Statistical Yearbook 2014.

Table A7. Annual growth rate in trade by sector

Countries	Crops				Livestock				Fishing				Forestry			
	Exports (%)		Imports (%)		Exports (%)		Imports (%)		Exports (%)		Imports (%)		Exports (%)		Imports (%)	
	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014
Antigua & Barbuda	--	-5.8	--	4.8	--	-23.9	--	6.3	--	15.8	--	2.9	0.0	0.8	0.0	9.3
Argentina	10.1	0.7	-9.5	2.7	13.4	2.8	-20.7	-15.0	-1.2	3.4	-19.8	6.4	19.2	-8.1	-9.3	-0.7
Bahamas	-2.2	-11.5	0.0	4.1	61.7	-31.1	4.9	5.3	3.9	0.6	1.8	3.9	62.7	3.4	-1.2	8.8
Barbados	2.5	3.3	3.6	2.5	1.7	0.2	5.9	5.6	-10.3	-8.2	7.3	6.7	--	-31.1	-7.0	-6.9
Belize	8.4	11.5	-2.7	6.3	-0.7	--	1.1	8.3	--	--	-10.0	-16.5	-9.8	-18.2	-17.2	10.4
Bolivia (Plurinational State of)	11.5	17.3	-1.8	13.3	7.0	40.5	-11.2	19.5	--	--	-25.1	12.2	6.1	-23.3	1.5	5.2
Brazil	18.1	6.0	-1.8	5.4	30.8	6.0	-18.5	10.6	14.8	-2.9	-4.8	10.8	12.8	1.8	-4.1	-2.6
Canada	7.5	7.4	9.0	5.4	2.1	6.6	1.3	11.6	6.0	3.5	2.5	6.5	1.1	3.3	3.4	0.7
Chile	12.4	7.2	6.6	10.5	37.1	4.8	11.5	10.8	8.4	12.6	21.2	11.4	6.5	2.6	16.7	2.3
Colombia	2.4	3.2	6.7	7.3	24.0	39.8	-16.7	29.7	-4.4	4.2	6.0	19.2	16.7	-5.2	6.7	1.9
Costa Rica	3.6	6.8	11.1	9.6	5.8	14.3	1.2	21.1	-0.3	15.8	12.3	83.6	9.2	7.3	4.0	8.4
Cuba	-8.0	--	10.5	--	21.7	--	11.4	--	-1.8	--	1.9	--	5.7	--	3.4	17.5
Dominica	-8.2	--	-1.7	--	--	--	3.0	--	--	--	0.1	--	6.5	0.5	-21.4	-14.2
Dominican Republic	11.3	5.7	18.1	4.6	-26.9	-0.9	14.5	6.2	7.0	23.2	47.5	-14.0	26.3	8.0	13.3	4.3
Ecuador	-6.1	5.4	9.5	4.4	-2.3	7.1	4.7	5.7	21.5	15.0	20.6	14.8	14.1	4.9	4.3	3.0
El Salvador	5.2	4.8	7.8	6.9	-3.8	9.2	4.2	12.0	4.8	5.9	4.0	7.5	-0.8	4.0	4.1	6.4
Grenada	-7.3	--	0.6	--	-15.9	--	1.2	--	-4.1	--	3.3	--	--	--	0.0	0.0
Guatemala		6.5	13.5	6.4	-3.8	3.0	6.9	6.5	--	-7.4	18.5	-2.5	16.9	3.9	8.1	4.1
Guyana	3.9	11.2	1.8	4.8	27.1	8.8	2.3	5.0	2.5	14.1	-13.1	15.2	-0.3	13.2	11.6	5.9
Haiti	--	--	--	--	--	--	--	--	--	--	--	--	--	28.6	4.5	-9.8
Honduras	-6.3	25.0	-5.7	13.0	20.7	20.8	5.9	4.1	50.0	13.7	26.3	-7.3	-1.2	30.0	11.4	7.2
Jamaica	2.1	-6.8	4.8	-3.4	2.6	4.7	0.8	-0.5	-9.3	10.3	2.9	4.0	-29.1	18.2	-2.4	0.5
Mexico	6.4	8.0	10.1	4.1	5.4	12.4	4.1	8.6	-2.2	8.2	20.2	14.7	6.6	8.4	6.8	0.9
Nicaragua	1.0	12.0	2.8	7.0	13.8	8.6	-6.3	8.1	1.9	25.4	-17.2	21.0	-3.6	67.8	9.6	-3.5
Panama	-1.7	-20.2		-1.8	-2.9	10.9		17.8	13.9	5.2	--	15.6	33.4	19.7	3.9	2.2
Paraguay	20.1	13.3	-11.4	5.4	7.5	13.6	-8.4	8.6	25.5	-14.1	-11.9	10.6	-4.1	-2.8	16.7	3.5
Peru	14.3	8.9	9.8	7.4	53.8	14.0	0.0	14.8	3.0	1.2	12.2	7.0	9.1	-9.6	12.0	5.0
Saint Kitts & Nevis	--	12.3	--	2.8	--	36.4	--	7.1	--	12.2	--	0.5	22.9	4.0	-0.5	-5.7
Saint Lucia		--	-1.9	--	-26.0	--	1.5	--	3.0	--	-2.3	--	0.0	--	0.0	-2.9
Saint Vincent & the Grenadines	-11.2	3.7	2.0	8.3	17.2	-26.7	5.1	7.5	-16.8	-23.5	7.7	12.1	49.6	13.5	-21.7	-0.6
Suriname	0.4	--	4.2	--	--	--	4.5	--	--	--	7.3	--	--	-1.6	0.0	-10.3
Trinidad & Tobago	--	--	--	--	--	--	--	--	--	--		--	-10.1	44.6	23.8	6.4
United States	-1.6	--	11.2	--	-16.3	--	3.6	--	-8.6	--	17.9	--	-5.5	16.5	12.3	0.3
Uruguay	10.1	15.2	-8.7	7.7	12.4	6.7	17.9	9.8	4.5	-8.6	6.3	-2.7	14.4	-0.4	-9.7	-1.2
Venezuela (Bolivarian Rep. of)		--	1.0	15.4	-31.4	--	7.0	25.4	-12.3	--	-12.8	16.4	4.6	--	-5.2	4.7

Source: Inter-American Institute for Cooperation on Agriculture (IICA) based on information from the United Nations (COMTRADE) & FAO (FAOSTAT).

Note: for HND y VCT, the last period is 2010/12. For ATG, BLZ, CRI y VEN, the last period is 2010/13.

Table A8. Participation of sector exports in total exports of goods (Annual growth rates, percentages)

Countries	Crops		Livestock		Fishing		Forestry	
	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014	2000-2004	2010-2014
Antigua & Barbuda	--	-4.2	--	-22.6	--	17.8	--	2.6
Argentina	3.0	1.6	6.2	3.7	-7.5	4.4	11.54	-7.25
Bahamas	4.6	-14.3	73.0	-33.3	11.2	-2.5	74.15	0.14
Barbados	10.0	-4.3	9.2	-7.2	-3.8	-15.0	--	-36.25
Belize		1.1	-2.8	64.3	--	9.6	-11.75	--
Bolivia (Plurinational State of)	0.2	0.8	-3.9	20.7	--	--	-4.70	-34.09
Brazil	3.2	3.8	14.2	3.8	0.3	-4.9	-1.48	-0.28
Canada	4.2	3.0	-1.1	2.2	2.8	-0.7	-1.97	-0.94
Chile	-1.6	6.3	20.0	3.9	-5.1	11.6	-6.82	1.69
Colombia	-3.0	-3.5	17.4	30.7	-9.4	-2.5	10.57	-11.32
Costa Rica		-1.5	1.9	5.4	-3.9	6.8	5.23	--
Cuba		--	13.9	--	-8.2	--	-1.13	--
Dominica		--	--	--	63.7	--	13.29	--
Dominican Republic	-1.0	-3.3	-35.0	-9.2	-4.8	12.8	12.31	-1.09
Ecuador	-9.1	1.7	-5.4	3.4	17.6	11.0	10.48	1.31
El Salvador	4.3	-0.7	-4.6	3.5	3.9	0.4	-1.59	-1.43
Grenada	15.4	--	4.7	--	19.4	--	--	--
Guatemala		1.4	-6.3	-2.0	-33.7	-11.9	13.97	-1.11
Guyana	3.2	3.1	26.2	0.9	1.8	5.8	-0.98	4.91
Haiti	--	--	--	--	--	--	--	--
Honduras	-5.5	1.6	21.7	-1.8	51.3	-7.6	-0.39	5.72
Jamaica	0.9	-8.1	1.3	3.2	-10.4	8.7	-29.95	16.52
Mexico	3.4	1.2	2.4	5.2	-4.9	1.3	3.64	1.52
Nicaragua	-4.0	-14.3	8.2	-16.9	-3.1	-4.1	-8.39	28.32
Panama		78.3	-5.0	--	11.5	--	30.54	--
Paraguay	4.1	2.7	-6.9	2.9	8.7	-22.2	-16.93	-11.95
Peru	-1.7	7.9	32.2	13.0	-11.5	0.3	-6.20	-10.37
Saint Kitts & Nevis		-5.6	--	14.7	--	-5.7	--	-12.50
Saint Lucia			-31.0	--	-4.0	--	-6.78	--
Saint Vincent & the Grenadines	-3.7	1.9	27.1	-28.0	-9.8	-24.9	62.27	11.49
Suriname		--	--	--	-46.1	--	--	--
Trinidad & Tobago	--	--	--	--	--	--	--	--
United States	-9.7	--	-23.3	--	-16.2	--	-13.37	--
Uruguay	4.1	6.8	6.2	-1.1	-1.2	-15.3	8.10	-7.62
Venezuela (Bolivarian Rep. of)	-14.1	-57.6	-34.7	--	-16.5	-72.6	-0.48	60.82

Source: Inter-American Institute for Cooperation on Agriculture (IICA) based on information from the United Nations (COMTRADE) & FAO (FAOSTAT).
Note: for HND y VCT, the last period is 2010/12. For ATG, BLZ, CRI y VEN, the last period is 2010/13.

Table A9. Annual growth rate of production by sector, percentages

Countries	Crops		Livestock		Aquaculture[1]		Forestry[2]	
	2000-2003	2010-2013	2000-2003	2010-2013	2000-2003	2010-2013	2000-2003	2010-2013
Antigua & Barbuda	0.41	1.09	-1.94	0.68	--	--	--	--
Argentina	3.31	0.38	-5.67	3.81	-0.56	10.81	8.09	4.12
Bahamas	-3.61	1.32	4.80	1.45	183.72	--	0.46	0.35
Barbados	-10.77	3.01	0.32	0.50		62.07	-0.43	-0.29
Belize	-1.27	3.01	19.20	6.15	35.99	0.34	0.00	0.00
Bolivia (Plurinational State of)	7.27	6.55	6.39	3.80	0.36	8.10	2.76	0.56
Brazil	6.74	2.44	4.83	3.61	17.03	0.69	2.88	4.09
Canada	-2.84	10.88	-0.42	0.24	9.82	2.47	-2.82	2.08
Chile	3.11	1.55	2.11	2.36	11.04	13.33	0.36	5.90
Colombia	4.63	2.88	2.68	2.27	-0.52	3.96	-3.24	-0.56
Costa Rica	1.26	4.64	2.11	3.28	32.05	3.38	-0.87	-0.10
Cuba	-8.21	7.34	-2.57	-0.20	-5.23	-1.18	17.43	-0.67
Dominica	-5.90	0.91	-0.92	0.70	21.38	-16.63	-0.59	0.03
Dominican Republic	1.46	-4.45	-2.94	1.70	17.60	6.55	2.15	1.98
Ecuador	-3.66	9.79	0.95	1.09	66.21	-8.28	-2.20	-0.10
El Salvador	-1.21	1.31	0.88	1.10	5.89	-2.96	-1.20	1.39
Grenada	3.26	2.01	1.46	0.09	--	--	--	--
Guatemala		6.41	13.75	2.29	20.44	-10.07	2.09	1.67
Guyana	6.70	-1.61	8.59	3.41	0.15	-21.21	0.86	-0.21
Haiti	-4.64	1.75	2.50	0.44	0.00	25.38	0.32	0.41
Honduras	9.99	1.00	4.36	0.61	32.18	33.13	0.19	0.80
Jamaica	-1.68	1.27	1.60	1.63	-9.02	-40.73	-7.20	-0.69
Mexico	2.23	3.78	2.07	1.14	14.05	9.61	-1.12	0.34
Nicaragua	5.75	12.85	1.69	1.14	8.53	19.25	-0.01	-0.17
Panama	-0.92	2.75	1.59	3.03	47.85	8.38	0.17	-0.87
Paraguay	13.52	1.13	3.37	2.32	126.33	22.88	1.00	1.02
Peru	4.24	4.11	3.77	3.93	29.68	8.24	-2.68	0.22
Saint Kitts & Nevis	4.90	3.39	-2.43	1.46	0.28	-13.19	0.00	0.81
Saint Lucia	0.39	13.74	0.38	2.15	0.00	0.00	--	--
Saint Vincent & the Grenadines	4.18	-0.35	-2.15	-1.34	--	--	-1.20	-0.57
Suriname	-5.02	1.24	12.28	0.78	141.00	27.89	0.51	0.08
Trinidad & Tobago	-6.95	3.28	1.36	-5.06	-8.14	1.20	-3.80	14.94
United States	-9.42	0.61	10.41	0.21	-29.07	-36.78	-4.76	-0.31
Uruguay	4.25	8.87	-0.37	3.45	-31.03	34.53	9.08	-5.51
Venezuela (Bolivarian Rep. of)	0.12	7.85	-1.91	3.77	5.46	12.96	1.61	0.05

[1] Farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants. Farming implies some sort of intervention in the rearing process to enhance production.

[2] Comprises all wood obtained from extraction operations in forests and in other areas during the current period year or forestry period)

Source: Inter-American Institute for Cooperation on Agriculture (IICA) based on official FAO information (FAOSTAT and FISGSTAT database).

Table A10. Land use in the Americas by category (1,000 ha)

Countries	Total land area[1]	Total Agriculture Area (TAA)[2]	Arable Land & Permanent Crops (ALPC)[1]	% ALPC/ TAA	Permanent meadows and pastures (PMP)[1]	% PMP/ TAA	Forest area[1]	Protected areas[2 y 3]
Antigua & Barbuda	44	9	5	0.6	4	0.4	10	12.2
Argentina	273 669	148 791	40 291	0.3	108 500	0.7	28 920	19 469.5
Bahamas	1001	14	12	0.9	2	0.1	515	298.6
Barbados	43	14	12	0.9	2	0.1	8	0.3
Belize	2281	160	110	0.7	50	0.3	1374	1084.0
Bolivia (Plurinational State of)	108 330	37 515	4515	0.1	33 000	0.9	56 581	22 707.1
Brazil	835 814	275 605	79 605	0.3	196 000	0.7	515 133	228 242.5
Canada	909 351	65 346	50 746	0.8	14 600	0.2	310 134	
Chile	74 353	15 809	1794	0.1	14 015	0.9	16 306	15 333.9
Colombia	110 950	42 618	3453	0.1	39 165	0.9	60 297	25 597.5
Costa Rica	5106	1885	585	0.3	1300	0.7	2651	1875.9
Cuba	10 644	6406	3572	0.6	2834	0.4	2939	2317.7
Dominica	75	26	24	0.9	2	0.1	44	17.1
Dominican Republic	24 836	7507	2531	0.3	4976	0.7	946 980	12 855.7
Ecuador	2072	1567	930	0.6	637	0.4	278	235.9
El Salvador	914 742	408 707	157 708	0.4	250 999	0.6	304 788	
Grenada	34	11	10	0.9	1	0.1	17	1.2
Guatemala	10 716	4429	2479	0.6	1950	0.4	3545	3493.8
Guyana	19 685	1678	448	0.3	1230	0.7	15 205	1100.8
Haiti	2756	1770	1280	0.7	490	0.3	99	8.3
Honduras	11 189	3235	1475	0.5	1760	0.5	4952	2498.9
Jamaica	1083	449	220	0.5	229	0.5	336	361.8
Mexico	194 395	106 705	25 808	0.2	80 897	0.8	64 492	30 948.9
Nicaragua	12 034	5071	1796	0.4	3275	0.6	2974	5501.5
Panama	7434	2265	725	0.3	1540	0.7	3227	2102.1
Paraguay	39 730	21 500	4500	0.2	17 000	0.8	17 225	2571.2
Peru	128 000	24 326	5529	0.2	18 797	0.8	67 692	25 021.2
Saint Kitts & Nevis	4832	2497	1300	0.5	1197	0.5	1972	1308.0
Saint Lucia	26	6	5	0.9	1	0.2	11	2.6
Saint Vincent & the Grenadines	39	10	8	0.8	2	0.2	27	8.3
Suriname	61	11	10	0.9	1	0.1	47	11.1
Trinidad & Tobago	15 600	83	66	0.8	17	0.2	14 751	2370.4
United States	513	54	47	0.9	7	0.1	225	219.5
Uruguay	17 502	15 259	1795	0.1	13 464	0.9	1834	519.5
Venezuela (Bolivarian Rep. of)	88 205	21 600	3400	0.2	18 200	0.8	45 700	50 098.7
Americas		1 222 937	396 793	0.3	826 143	0.7	2 491 288	
Latin America and the Caribbean		748 884	188 340	0.3	560 544	0.7	1 876 367	458 195.7

[1] Source: FAO, FAOSTAT (2012).
[2] Source: ECLAC, CEPALSTAT (2012)
[3] This indicator provides information of the total surface of protected areas (terrestrial and marine) of a country.