The Outlook for Agriculture and Rural Development in the Americas:

A Perspective on Latin America and the Caribbean

2014

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http://www.rlc.fao.org
http://www.iica.int

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Printing: IICA, Sede Central

The Outlook for Agriculture and Rural Development in the Americas:
A Perspective on Latin America and the Caribbean: 2014 / ECLAC, FAO, IICA.
-- San José, C.R.: IICA, 2013.
230 p.; 21.59 cm. x 27.94 cm.

FAO E-ISBN 978-92-5-308259-9 (PDF)
Also published in Spanish

1. Agriculture 2. Agricultural development 3. Macroeconomic analysis Livestock 5. Forests 6. Fishing 7. Institutional development 8. Land de tierras 9. Family Agriculture 10. Latin America 11. Caribbean. Technical assistance I. ECLAC II. FAO III. IICA II. Título

AGRIS E50
DEWEY 338.1

San José, Costa Rica
2013

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Acknowledgements

This document is the result of a joint effort by the Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Food and Agriculture Organization (FAO) and the Inter-American Institute for Cooperation on Agriculture (IICA). It was prepared by an interagency team comprised of Adrián Rodríguez, Mônica Rodrigues and Octavio Sotomayor of ECLAC; Byron Jara and Salomón Salcedo of the FAO; and Joaquín Arias, Rafael Trejos, Ileana Ávalos and Hugo Chavarría of IICA.

Interdisciplinary work groups were formed for the preparation of the chapters, coordinated by the different institutions, according to their spheres of competence. The members of these groups deserve special acknowledgement:

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Finally, our thanks to Olga Patricia Arce for her journalistic work, to Peter Leaver for editing the text, to Francisca Lira for the layout of the report, and to Eugenia Salazar for updating the Statistical Annex.

Foreword

The growth of agriculture in Latin America and the Caribbean (LAC) lost momentum in 2013, despite having rebounded in 2010 and performed well in 2011. On both occasions, the performance of agriculture in the region had been driven primarily by volatile prices for the major raw materials, but by 2012-2013 the sector had come under the influence of four main factors:

- A slowdown in world economic activity, affecting both developed countries and emerging economies, especially China, India and Brazil.
- Loss of buoyancy as world trade in goods grew by only two percent in real terms in 2012 (the lowest growth in the past 30 years), combined with lower international prices for the chief agricultural commodities.
- An increase in adverse weather events (droughts and flooding) that affected the region's agriculture and led to a drop in the output of grains, oil-seeds and tropical products, and of the livestock and fisheries subsectors.
- More outbreaks of crop pests and diseases, caused by greater climate variability.

Growth in LAC agriculture in 2013 declined more severely than the region's economies as a whole, with Agricultural Value Added rising by less than the region's overall Gross Domestic Product.

Despite the figures posted in 2012 and 2013, economic conditions in 2014 are expected to favor growth in the region's agricultural production and trade. These trends will need to be shored up by policies that seek not only to make commercial agriculture more productive and more competitive, but also to boost family agriculture's performance and successful integration into value chains.

In this fifth edition of the "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 Food and Agriculture Organization of the United Nations (FAO) and the Inter-American Institute for Cooperation on Agriculture (IICA) analyze the trends in, and prospects for, agriculture and its (macroeconomic and sectoral) context, and devote a special section to an in-depth examination of the characteristics, challenges and potential of family farming in LAC.

The report concludes that, despite the serious production, trade and socioeconomic constraints that family agriculture is experiencing in the region, this economic activity holds the greatest potential to boost the food supply, lower unemployment and reduce the levels of poverty and malnutrition of the region's most vulnerable rural dwellers.

In each chapter, ECLAC, FAO and IICA offer policy recommendations that they consider necessary to reinvigorate the region's agriculture and to spur the development of rural territories. In the particular case of family farming, the report underscores the need to implement intersectoral policies that will encourage new generations of farmers to remain in the countryside and foster innovation and knowledge management; and to develop instruments that will enable them to integrate into value chains successfully.

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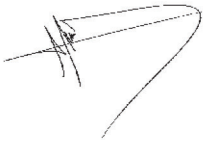

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Synopsis

Synopsis

In line with the structure of previous reports, the 2014 edition of the Outlook for Agriculture and Rural Development in the Americas is divided into two main sections. The first three chapters focus on:

- Macroeconomic context: an analysis of recent developments and the outlook for the financial and macroeconomic conditions that shape the international context, which impacts the performance of the region's economies.

- Sectoral analysis: an analysis of the growth of expanded agriculture in a context of low global economic growth.

- Rural well-being and the institutional framework: an analysis of the significant changes taking place in living conditions in the rural milieu, and the policies and institutional framework for agriculture.

The second section of the document not only considers the overall situation of family farming in Latin America and the Caribbean (LAC) but also examines the challenges facing this sector, its potential and the outlook for the years ahead. The report is complemented with a statistical annex that includes the main indicators and statistics used. Both sections include policy recommendations.

A synopsis of each section is presented below:

Section I: Outlook for Agriculture and Rural Development in the Americas

An unfavorable macroeconomic and sectoral context for agriculture

The sluggish performance of LAC's expanded agriculture sector (crops, livestock, agro-forestry and fisheries) during 2013 paralleled the slowdown in the global economy, which affected both developed countries and emerging economies (especially China, India and Brazil). However, it was also exacerbated by several other factors that had a negative impact and caused the region's economies to lose momentum.

Unlike previous years, when the performance of agriculture was driven primarily by volatile prices for the main raw materials, during the 2012-2013 farming year the factors that most affected the sector were a slowdown in world trade in goods, lower international prices for the leading agricultural commodities and an increase in adverse weather events that directly affected agriculture and resulted in outbreaks of crop pests and diseases.

The region's agriculture, whose growth was being driven by exports, was hit by a series of factors, including a downturn in global demand, the devaluation of the dollar, pests and diseases, an increase in non-tariff barriers to trade and, during the first semester of 2013, falling international prices. These developments, associated with the recession in the Eurozone countries, were mainly linked to the deceleration of growth in China.

The impact was greater in the export-oriented, non-dollarized countries. Consequently, LAC's agrifood exports declined by 0.5% in 2012 after annual growth of 11.4% during the previous seven years. In 2013, the value of the region's exports increased, roughly, by only 4%. In this context, domestic consumption in the LAC economies became the main driver of growth in the region.

In 2011, agricultural value added (AVA) in LAC rose by 2.7%, well below the 4.3% growth in overall regional GDP. However, some countries performed well, with growth rates above 6%, including Chile, Jamaica, Bahamas, Antigua and Barbuda, St. Kitts and Nevis, Ecuador and Dominica. In other countries (e.g., Argentina, Honduras, Nicaragua, Paraguay and Jamaica), producers benefited from the very favorable inter-sectoral terms of trade for agriculture, which improved their incomes and purchasing power.

Because of the inauspicious macroeconomic context in 2012 and 2013, estimates of the outlook for growth in the region have been revised down, due to the sluggish performance of LAC's biggest economies (Brazil and Mexico). However, the report forecasts better economic conditions for 2014, with an expected increase in the region's agricultural production and trade, although international prices for all basic commodities are expected to fall in the long term, except for those of beef, pork and fish.

Crop production: LAC was affected by the global context

After a recovery in 2010 and a good performance in 2011, agricultural production in LAC lost momentum in 2013. In large measure, this was due to the greater relative weight of agriculture in the south of the region, which was already showing signs of deceleration in 2012, even though in previous years it had been the area that performed the best.

In Mexico and Central America, agriculture also grew in 2012 but ran out of steam in 2013. By contrast, in the Andean region agriculture recovered in 2012 and remained strong in 2013, while the performance of agriculture in the Caribbean countries was uneven.

Climate variability was once again the factor that had the greatest impact on crops throughout the region, severely affecting not only the production of grains and oilseeds, but also tropical products such as coffee, bananas, citrus fruits and sugarcane.

In the case of coffee, an outbreak of coffee rust significantly affected production in tropical parts of the region throughout 2013 and the negative impacts of this disease will continue to be felt during 2014, with major economic and social implications, given that small farmers produce the lion's share of the coffee crop.

In 2012, the positive balance that LAC had achieved in its trade balance for crops, which stood at USD 67 billion, also weakened, due to the 1.8% decrease in the value of the region's agricultural exports, while imports increased by 10%, maintaining the growth trend shown since 2009.

Nevertheless, production forecasts for the end of 2013 are more optimistic, with record grain harvests in the Americas, especially in the most northerly and southerly parts of the continent. Global demand is expected to pick up in 2014, driven by growth in the developing world and the expansion of its middle classes, provided there are no adverse effects from extreme weather conditions and an ever-weaker US dollar.

Livestock: rapid growth over the last decade

LAC continues to achieve impressive growth where meat and milk production are concerned. Poultry production leads the way, having nearly doubled between 2001 and 2011, while beef, pork and milk production increased by more than one-third in the same period. A major increase in productivity, due

not only to the widespread adoption of new technologies but also to improvements in production practices, accounted for most of this growth. However, meat production and livestock inventories are concentrated in a few countries of the region (Argentina, Brazil, Mexico and Uruguay).

The economic bonanza fuelled by livestock production plays an essential role in contributing to the economic well-being of poor families in the rural areas of LAC countries, and offers great potential in family farming. Livestock provides a source of food, income and draught animals to produce food and dung for use as fertilizer and fuel; it is also an activity that enables rural families to improve their economic and social conditions during the good years and cushion the effects of bad years.

Livestock production has undergone many changes: on the production side, mixed production systems that include crops, livestock and dairy have come to the fore. The rapid increase in per capita consumption of meat and milk has been accompanied by a shift in the main sources of calories and proteins. However, there is growing concern over the undesirable (especially environmental) costs of this activity and outbreaks of diseases, which must be considered carefully along with the benefits of that growth.

Meat production in LAC is expected to continue its rapid growth in the coming decade, although at a slightly lower annual rate than in the preceding period. Brazil will remain the leading exporter of poultry meat in LAC, accounting for almost 90% of the region's total poultry exports, 71.6% of pork exports and 51.7% of beef exports, while Chile will significantly increase its pork exports (16.5% of the regional total).

Forests: deforestation continues across the LAC region

Loss of forest cover and forest degradation continue to be major problems in LAC, depriving rural populations of development opportunities. LAC accounts for most of the world's deforestation, with the figure being put at 3,944,000 ha per year, or 70.7% of the forest cover lost across the globe, between 2005 and 2010. With the exception of the Caribbean, where the area of forest cover actually increased, in the rest of the region the trend was negative. This was particularly the case in South America, where a loss of forest cover of 3,581,000 ha per year was recorded (64% of the world total).

Forest conservation and sustainable forest management offer great opportunities for the development of family farmers in the LAC region. The forests and trees found on farmland are an essential element for the subsistence of the rural population, given the goods and services they provide.

In general, there is a growing tendency in LAC to place greater value on the services provided by forests, particularly in rural communities, because climate change mainly affects vulnerable populations and family farmers. Consequently, the control of deforestation should be made a priority in public policies.

Fisheries and aquaculture: growing demand for fish is a major opportunity for aquaculture

World demand for fish is growing significantly, driven by increased consumption in developing countries. Although fish production has grown at nearly twice the mean rate of the world's population, it is estimated that it will not be possible to meet future demand by means of marine resources, since production has stagnated due to overfishing. Therefore, demand will have to be met with fish farming, which could put more pressure on the main pelagic fish species in the south (such as anchoveta), which are processed into fishmeal.

This imbalance between supply and demand will likely drive fish prices higher, thereby increasing the risk of volatility. In addition, given the shortage of fish, there would be fewer resources for processing into fishmeal and fish oil, which would raise the costs of aquaculture production. The uncertainty is even greater in the absence of a realistic assessment of the effects of climate change.

Aquaculture production has grown gradually and steadily in LAC (South America leads the way with over 70% of regional production) and has now caught up with commercial fishing in terms of fish produced. It has the potential to grow to such an extent that it could supply the expected increase in demand for fish. However, it is important to ensure that this does not occur at the expense of sea-caught fish processed into fishmeal.

Rural well-being: the rate of rural poverty has declined but remains high among agricultural households

In most LAC countries, a number of changes are evident in the structure of production in rural economies, such as the rising rates of rural employment in non-agricultural sectors and the growing importance of wage labor. This has led to a decline in the relative importance of rural households linked to family agriculture, even though this sector remains the largest in many countries. Therefore, in the context of the structural changes taking place in the rural milieu family farming faces a challenge as far as viability is concerned. In addition, while the numbers of women who are heads of family-farming households remain low, they have risen during the last decade and are more frequent in urban areas.

From the socio-demographic standpoint, other trends are evident, such as the fact that heads of household are, on average, oldest in family-farming households, which poses a generational challenge. Moreover, the heads of family-farming households have the lowest levels of education, which poses a skills challenge.

The report makes a number of policy recommendations in order to meet these challenges, including the following: develop new (agricultural or non-agricultural) production activities with greater value added, to offset the possible loss of employment in segments of family farming that become unviable in a context of structural change; enhance the skills of rural dwellers to facilitate their insertion into new productive activities; and promote those segments of family agriculture that have higher productivity rates, greater viability and potential in economic, social and environmental terms.

Policies and institutional framework: countries make family farming a priority

The report emphasizes that family agriculture is becoming a priority on the agendas of many LAC countries, which are adopting policies and instruments to benefit this sector, considered essential for food security and rural well-being in the region. Bolivia, for example, has declared family farming an activity of national interest; Argentina has been investing significant resources in family agriculture; Costa Rica adopted the 2011-2014 Family Agriculture Sector Plan; Chile approved an 8.2% increase in the 2013 budget in order to strengthen smallholder agriculture; Mexico implemented the "National Crusade Against Hunger" a social inclusion initiative; and MERCOSUR issued regulations for the Family Farming Support Fund.

The institutional framework is also being reconfigured and adapted to the new challenges, with government agendas placing greater emphasis on new issues such as pest control, climate variability and water resource management. In addition, public administration is being modernized to make it more inclusive.

The report includes some policy recommendations for improving the institutional framework, such as the strengthening of policies with instruments, budgets and increased citizen participation, to make them more effective; the promotion of mechanisms for citizen participation; the inclusion in national public policies of cross-cutting issues such as youth, gender and indigenous populations; and a move toward strategic thinking and prospective analysis, to provide a timely response to new challenges.

II Section II: State of and Outlook for Family Agriculture in LAC

The special chapter of this report focuses on an analysis of the state and potential of, and outlook for family agriculture (FA) in LAC, based on a subregional vision. First, it explains that FA is the largest single socioeconomic group in the region, accounting for 70% of production units in almost all the LAC countries. FA is a very heterogeneous sector, in terms of its scale and access to resources; it is also the economic activity that faces the greatest constraints and produces lower yields compared with commercial agriculture. The report then examines the structural changes taking place in the sector: whereas in Mexico and in the Andean and Central American countries farms are being broken up into ever smaller plots, a trend toward the concentration of land is observed in the Southern Cone countries.

The report examines the importance of family farming in each country in terms of the contribution that it makes. In the Southern Region, FA's share of agricultural value added (AVA) ranges from 19% to 38%, while in the Andean and Central American countries the figure is between 40% and nearly 60%. In most LAC countries, FA's share of agricultural sector employment exceeds 50% of the total. The report also analyzes FA as a percentage of all farms and the characteristics of farms of average size, which vary greatly in the different subregions of the continent.

The report underscores FA's potential to contribute to a more sustainable and equitable form of production, increase the food supply and improve the living conditions of the most vulnerable populations. It concludes that promoting the growth of agriculture is the most effective way to reduce rural poverty.

The prospects of increasing LAC's agricultural output by opening up more land for farming are very limited, so countries will be forced to tap the potential of FA. However, this will call for multidimensional strategies and the implementation of policies that take account of the sector's different needs and propose comprehensive and relevant solutions. It will also be necessary to strengthen links between small farmers and markets and, in particular, to adapt their production methods to new market demands, and improve the use of information and communication technologies (ICT) in rural areas to support effective decision making.

Chapter 1: Macroeconomic context

Macroeconomic context

Facts

- By late 2012, the progress achieved in some areas made it possible to say that there was a lower risk of a worsening global economic crisis. That progress included agreements to increase fiscal discipline in the Eurozone countries, the fiscal agreement reached in the United States, and the stabilization of international oil prices.
- In the global financial markets, risk premiums fell in all regions, especially in Europe. Nonetheless, the sustainability of public debt remains a problem in several Eurozone countries and the United States. The situation is compounded by a lack of competitiveness, a long-term factor that is key to the crisis.
- In the emerging market economies, including China, there has been a weakening of domestic demand and international trade, and structural limitations to investment growth have been identified. The growth forecasts for those economies are being adjusted downwards, with negative impacts on global activity.

Trends

Although the most urgent threats have been addressed, central and emerging economies have not managed to reactivate growth.

The first half of 2013 produced both good and bad news in the world economy. The good news was that the countries most impacted by the global economic crisis –the peripheral countries of the Eurozone and the United States– had successfully warded off, for the time being, the most pressing threats to their economies, which had precipitated the collapse in global growth rates in late 2012. Those threats included the absence of an agreement on the fiscal cliff in the United States and the possible institutional collapse in the Eurozone that would have made it impossible to renegotiate the debt of the monetary union's peripheral countries.

As a result of the (albeit partial) solutions reached on these issues, the world's leading economies stimulated improvements in global financial stability indicators, especially with regard to reducing market volatility. Nevertheless, and this is the bad news, growth rates in both the advanced economies and emerging countries have not risen since then.

As a whole, the Eurozone countries ended the second quarter of 2013 with a slightly negative growth rate (-0.5% compared to the same quarter the previous year, according to Eurostat), thereby concluding two years of falls in gross domestic product (GDP). The southern European countries were not the only ones

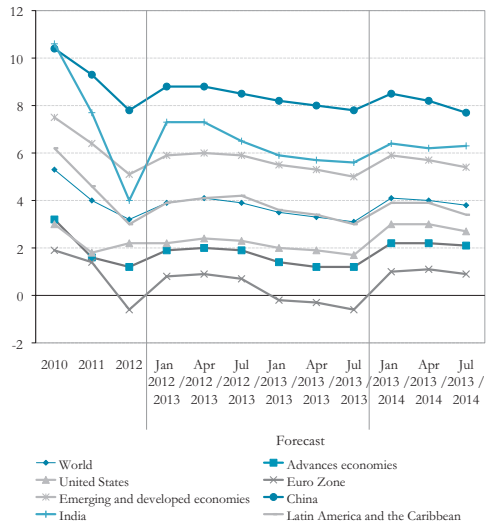
that experienced several quarters of GDP shrinkage; some central economies, including France and even Germany, are experiencing a marked slowdown.

In the United States, the GDP growth rate has remained positive since mid-2009 but, according to experts, the rate is lower than required for economic recovery (ECRI 2013). This explains why, even though the United States has not been officially included in the group of countries in recession, its recent growth has not been sufficient to return the employment rate, average household incomes, or industrial production to pre-crisis levels.

For its part, Japan may make history if the Bank of Japan's recent monetary injection –one of the largest in central bank history, and which will double the monetary base in two years– achieves its objective of expanding GDP after many years of deflation and limited or no growth. Japan's monetary expansion is expected to accelerate growth, at least in the short term, which is reflected in the updated forecasts for Japan made by the principal international agencies (see, for example, IMF, 2013a, 2013b and 2013c).

The Japanese strategy reveals the skepticism that is becoming widespread among advanced countries regarding the use of conventional formulas to overcome the present crisis. In particular, note has been taken of the limitations of interest rates –currently practically zero in most developed countries– as an instrument of monetary policy, which has led many central banks, including the Federal Reserve of the United States and those of several emerging countries, to adopt unconventional economic stimulus measures.

Figure 1. Growth rates and GDP projections (percentages).



Source: Prepared by the authors, based on data from World Economic Outlook, IMF.

Although growth estimates continue to be higher for the emerging economies than for the advanced ones, those estimates were trimmed between late 2012 and mid-2013. China closed 2012 with a growth rate of less than 8%, while in India the slowdown was much sharper, showing how these economies are aligned with the rest of the world and especially with the advanced economies, which are the key markets for their products and services.

In Latin America and the Caribbean (LAC), after the sharp decline in 2012 –sharper even than the decline in China– growth stabilized in 2013 and a timid recovery is forecast for 2014, showing how difficult it is for economies of the region to recover in the present scenario.

As a result of a weakening of both the world economy and external demand, growth in the region has relied on domestic consumption

Although in 2012 the region as a whole experienced a sharper decline in growth than the global average, performance in the different subregions has varied. Thus, the GDP growth rate in South America fell from 4.5% in 2011 to 2.5% in 2012, while in Central America and Mexico it held steady both years at 4.3% and 3.9%, respectively, according to the Economic Commission for Latin America and the Caribbean (ECLAC).

When this report was concluded, it was expected that the 2013 regional product would grow at a rate similar to the previous year, that is, around 3%. The international agencies have trimmed LAC's growth prospects for this year, given the rather unfavorable performance of Mexico and Brazil, the region's largest economies. In addition, there has been a slowdown in economic activity in other economies that had been experiencing significant growth, including Chile, Panama and Peru.

At any event, the principal source of growth in 2013 continues to be domestic consumption, although at a slower pace than in recent years. In addition, the slowdown in consumption growth has not been offset by an increase in investments or an expansion of net exports, which explains the decline in the region's growth rate (ECLAC, 2013c).

The recent growth in the region's economies attributed to domestic consumption has been associated with increases in the wage bill, resulting from job market improvements, income redistribution policies implemented in the last decade, and consumer credit growth. The regional unemployment rate fell gradually over the last few years to 6.4% in 2012, almost five percentage points lower than ten years ago. In that same period, growth was also observed in the employment rate –especially among women–, in real average wages, and in the minimum wage. On the other hand, in the first quarter of 2013 the positive performance of the labor market showed signs of exhaustion, with a drop in the labor force participation rate and a decline in the real wage growth rate to below 2012 levels.

Some of the indicators that supported domestic demand growth in recent years, including increased private sector credit and public consumption growth, could moderate expansion in 2013, which would have an impact on regional growth forecasts for this year and next.

According to ECLAC (2013c), during the first half of 2013, domestic credit in several South American economies, especially Brazil and Chile, declined significantly as compared to 2012. In contrast, domestic credit growth accelerated in Nicaragua and Panama during the first months of 2013, and recovered in most of the Caribbean economies. In the region as a whole, the mortgage loan growth rate experienced its main decline as compared to previous years. Business and industrial credit growth rates also declined. In 2013, only consumer credit sustained its growth rate.

In turn, as a result of the expansive fiscal policy and sustained public consumption, the fiscal deficit (the gap between revenues and expenditures) rose in 2012, with some exceptions, as spending grew faster than income. According to ECLAC (2013a), spending growth, especially current and capital expenditures, helped sustain domestic demand growth. Due to the increase in current public spending, public employment increased at a faster pace than private salaried employment. The situation had not changed in the first quarter of 2013, and public spending continued to outpace revenue growth, even

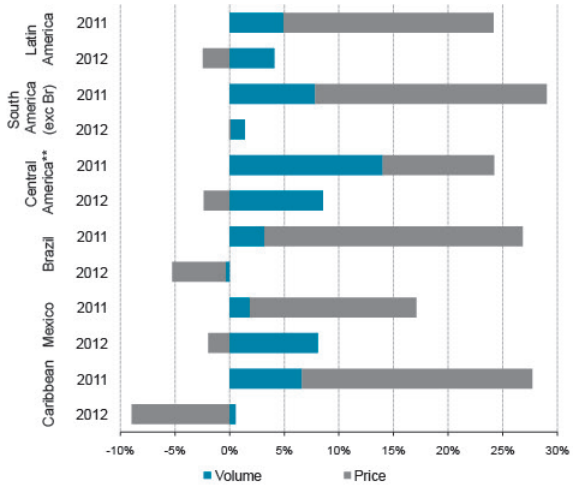
though tax yields fell or growth moderated in several countries as a result of falling prices for some export commodities and a downturn in consumption growth rates.

This trend in public spending suggests a certain consensus in the region to protect or promote public investments in order to stimulate demand in periods of transitional deceleration (ECLAC 2013c). However, in estimating growth in public accounts, the countries' fiscal leeway and regulations should be taken into account if tax collection growth does not recover, which could limit continued expansion of public spending in coming years.

International trade is the main channel by which the deteriorating conditions in the world economy are transmitted to the LAC economies

Variations in regional exports, in terms of volume and (primarily) price, have been sharper than the variations in the GDP in recent years. According to ECLAC (2013a), the drop in external demand led to a mere 1.6% growth in the value of regional exports in 2012, compared to the 23.9% surge in 2011. The turning point in the export growth rate was especially evident in Brazil and in the

Figure 2. Latin America and the Caribbean: estimated variation in the value of exports, by volume and price, during 2011-2012* (in percentages)



* The data for 2012 on the Caribbean covers Bahamas, Belize, Guyana, Jamaica, Suriname, Trinidad and Tobago and the Eastern Caribbean Currency Union (Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent and the Grenadines).
** Costa Rica, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama.

Source: ECLAC 2013a.

Caribbean subregion, with price being the main cause in Brazil and volume the main cause in the Caribbean subregion (Figure 2). In the rest of the world, trade has also proven to be one of the main channels by which the crisis is transmitted (IMF 2013a).

The 2012 price fall for some of the main export goods of the region had an adverse impact on exported value. Unlike in previous years, it was an increase in volume that promoted the modest growth in exports. The weakening of external demand also partially eroded the region's terms of trade.

The value of the region's exports is expected to expand in 2013 by around 4%, while the value of imports is expected to rise by more than 6%. This weak export growth is due to the decline in exports in early 2013 from some South American countries, particularly Argentina, Brazil, Colombia and Peru. This is explained primarily by the recession in the Eurozone countries, an important destination for these countries' exports, and by some erosion in the prices of products that constitute a large proportion of their total exports.

Indeed, in the first half of 2013, the prices of several of the region's export products fell, especially minerals and metals, oil, and some food products. In addition to being associated with the recession in the Eurozone, this trend is linked in large part to a certain slowdown in China. For LAC as a whole, the terms of trade are expected to remain close to 2012 levels (ECLAC 2013c).

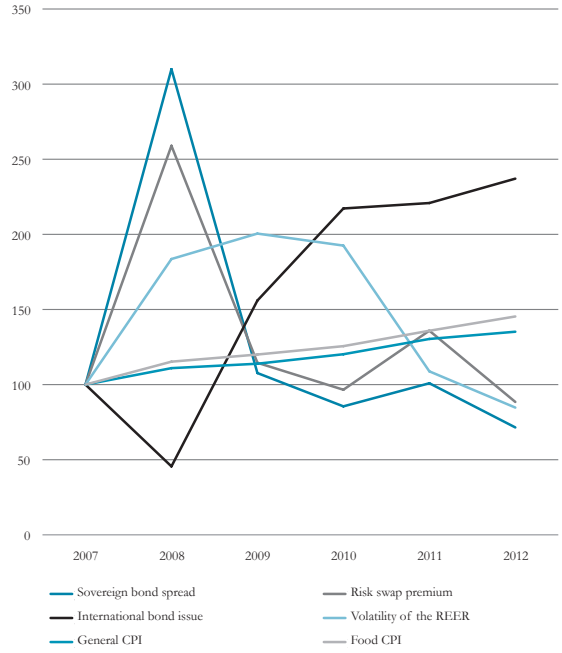
In addition, current transfers, largely remittances from workers living abroad, rose modestly in 2012 and the first months of 2013, although there were marked differences among the countries. The growth in remittances to some Central American countries reflects a relative improvement in the United States labor market, while the fall in remittances to Colombia and Ecuador points to the difficult labor situation in Spain. One of the consequences of a decline in regional exports without a corresponding increase in current transfers has been an increase in the region's current account deficit, from 1.3% of regional GDP in 2011 to 1.8% in 2012, which is expected to reach 2% in 2013 (ECLAC 2013a and 2013c).

Although in 2012 risk levels fell in the region and across the globe, financial volatility could increase again in 2013

Recent policies implemented in LAC in response to the global financial and economic crisis have helped to strengthen most of the countries' institutions and macroeconomic bases. As a result, most countries have been able to make positive and steady progress to reduce risk level perception by financial markets, control inflation, secure external financing and stabilize real exchange rates.

As can be seen in Figure 3, there was a sharp drop in the medians of sovereign bond and risk premium differentials in the region as compared to the peaks reached in 2008 and 2009. In addition, since 2008 the issuance of international bonds (sovereign, bank and business) has grown strongly, indicating greater access by LAC countries to international credit lines. For its part, the volatility of the regional median of real effective exchange rates (REER) has been low since 2010, indicating better cash inflow management in LAC economies. Finally, consumer price indices (CPI) improved last year, with a downward trend if food inflation is excluded.

Figure 3. Evolution of financial risk, exchange rate volatility and inflation variables in LAC



Source: Prepared by the authors based on CEPALSTAT data.

Naturally, regional indexes mask the diversity of performances among the countries of the region. In some economies, financial risk indicators did not decline. The main exception is Argentina, where the rising perception of risk stemmed from the effects of exchange rate measures taken to prevent a decline in international reserves, among other factors. With regard to inflation rates, the main exceptions to the general downward trend of the CPI in 2012 were Argentina, Dominica, Jamaica, Mexico, Trinidad and Tobago and Uruguay, mainly due to a bigger rise in food prices (ECLAC 2013a).

In the first five months of 2013, regional inflation accelerated slightly over December 2012. In a number of countries, such as Venezuela, Argentina, Jamaica, Uruguay, Haiti, Trinidad and Tobago and Nicaragua, inflation exceeded the regional average and, in the case of the first two countries, was in double digits. This price performance could endanger the (countercyclical) monetary measures taken to stimulate domestic growth in the context of the current global economic slowdown (ECLAC 2013c).

The first half of 2013 saw heightened international financial instability, which was reflected in considerable variations in the exchange rates of several countries of the region. Events such as the Chinese economic downturn and the recent announcement by the United States Federal Reserve that it would reduce its purchases of assets contributed to increasing uncertainty in international markets, with effects throughout the region. According to ECLAC (2013c), there is a strong correlation between these events and the devaluation of real exchange rates in the regional economies most strongly integrated in world financial markets (Brazil, Colombia, Chile, Mexico and Peru).

Nonetheless, despite increased international financial volatility, the region continued to have access to external financing to cover the growing current account deficit. In early 2013, there was continued growth in net flows of foreign direct investment (FDI) and foreign portfolio investment, while other net investment liabilities were positive for the first time in several quarters (ECLAC 2013c). FDI reached 1.4% of regional GDP in early 2013 compared to 2.2% in 2012, while foreign portfolio investment amounted to 1.2% compared to 1.7% the previous year. Thus, despite the slight increase in the current account deficit forecast for 2013, international reserves in the region continue to grow.

Prospects

Although the short-term risks for financial stability have receded, the progress achieved is fragile

As noted earlier, the main risks to global financial stability receded in recent months, which spurred an increase in share prices in advanced and emerging markets and dampened volatility (IMF 2013b). Nonetheless, this progress did not translate into growth in bank lending in the most depressed economies; rather, loan terms continue to be restrictive and therefore their effect on economic activity has been limited. The fiscal adjustments being made in many of those economies, as well as high debt levels and low export competitiveness, contributed to curbing a possible recovery.

In that scenario, growth prospects in the world economy for 2013 and 2014 have tended to be adjusted downwards. While in April 2012 the International Monetary Fund (IMF) forecast a 4.1% global growth rate in 2013, the last estimates in July 2013 suggest that 2013 will close with a world GDP growth rate of 3.1% (Figure 1). For 2014, the recent adjustment in global growth projections has also fallen: from 4.1% to 3.8%.

The IMF predicts an upturn, at different rates, in the advanced economies: in the United States, slower growth in 2013, linked to the automatic sequestration of public spending, but recovering in 2014, especially due to the strength of household consumption; in the Eurozone, a contraction of activity in 2013 and a very gradual recovery beginning in 2014; in Japan, acceleration of growth in 2013, attributed to the recent fiscal incentive, and moderation of growth in 2014, due to a weakening of the world environment.

In emerging and developing economies, a relatively moderate expansion (between 5% and 5.5%) in product is expected in 2014, reflecting weaker prospects in all regions, including the downturn in China and the less favorable panorama for many commodity-exporting countries, including the BRICS group (Brazil, Russia, India, China and South Africa).

If the medium-term risks materialize, the rate of world economic growth will decline in the coming years

There is a real risk that weak European growth will extend beyond 2013, given the high debt burden (sovereign and private) of some countries and high financing costs. At the same time, the United States still needs to reach an agreement that offers a more definitive solution for financing its present deficit and for managing the deficit in the future.

In Japan, it remains to be seen whether the recent strong monetary expansion will be sufficient in current international conditions – where many countries are turning to exports as a way out of the crisis– to stimulate a devaluation of the yen and boost competitiveness. In that scenario, should doubts grow regarding the sustainability of the advanced economies' fiscal policies, the sovereign risk premiums of those economies could rise, with a significant impact on the global economy.

In the case of emerging economies, a differentiation should be made between first-order and second-order risks. First-order risks are related to policies adopted in emerging countries that are large enough to affect other countries or even the world economy. This is the case of China and, to a lesser extent, the other BRICS countries, where fiscal and monetary policies and the regulation of cash inflows have an impact on competitiveness and international trade because they affect credit, investment and consumption levels, as well as

the real exchange rate, among other variables. Moreover, the sustainability and credibility of their policies tend to affect the risk differentials of emerging economies as a whole.

Second-order risks refer to possible damage caused by the crisis (through international trade) and by market pessimism (through financial conditions) in the advanced economies and other emerging economies. After several years of depressed global activity and strong domestic support in those economies, the maneuvering room of fiscal policies, as well as public financial resources, has shrunk, increasing vulnerability to external impacts. In that scenario, there is greater risk of a widespread slowdown in economic activity because emerging countries cannot counter weak growth in the world economy with the strength of their domestic demand.

In LAC, one of the most important medium-term risks is a reduction in the contribution made by the terms of trade to income growth, which was particularly high throughout the last decade. This risk is more significant in economies that are highly specialized in producing and exporting commodities, where terms of trade growth has been responsible in recent years for at least one third of growth in available national income and domestic demand (ECLAC 2013c). In addition, in several countries of the region, the rising prices of commodities and the consequent improvement in the terms of trade was translated into greater public savings, subsequently being used to implement public social and redistributive policies. A change in the international price trend would have important implications for the domestic demand growth rate and, in the current context of global deceleration, the region's growth rates.

The trend of falling prices for the region's export products will have an impact on the terms of trade, albeit to different degrees among the different countries

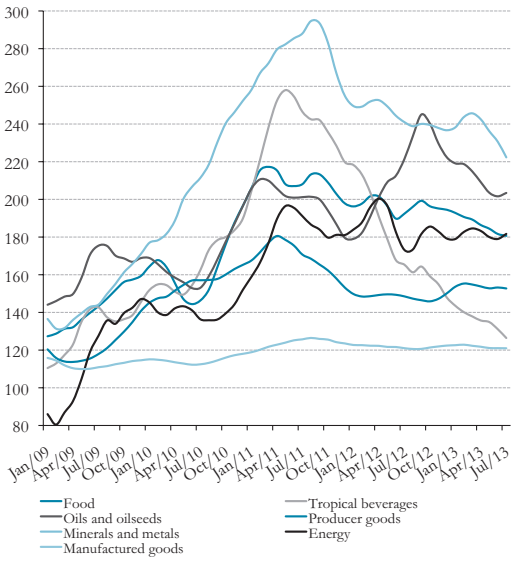
Estimates by ECLAC (2013c) and the IMF (2013c) point to a consolidation of GDP growth at 3% in 2013 (same as 2012) and a slight acceleration, to 3.4% in 2014. Available data suggest that most of the economies of the region, especially Venezuela, Mexico, Ecuador and Costa Rica, will experience a slowdown in the rate of GDP growth this year. Paraguay is the main exception, given the double-digit growth rate expected for 2013 due to an expansion of agricultural activity and the construction sector. On the other hand, slower growth in the Asian economies is having an impact primarily in the South American countries, and the falling prices of several of the region's export products are having a differentiated impact on the economies of the region.

Although the growth prospects of the prices of LAC's key export commodities are toward stabilization and even decline, they are expected to remain high in comparison with historical levels. In the short-term, that is, the rest of 2013, the price of mining and metal products as a whole is expected to fall moderately as compared to 2012. In turn, the forecasts of low world growth and deceleration of demand, especially in the Eurozone, caused oil prices to fall in the first half of 2013. Nevertheless, the tensions in the Near East associated with the imminent attack on Syria once again spurred an increase in crude oil prices, reaching their highest level in the last two years. Food prices, meanwhile, have also tended to fall thus far in 2013, especially due to the performance of sugar and oilseed prices,

production of which recovered last year (see Figure 4 and the chapter entitled the Context of the Agricultural Sector).

In LAC, the impact of variations in international commodity prices will be mixed, depending on each country's export structure. The terms of trade for the region as a whole are expected to remain stable, mainly due to the performance of Brazil and Mexico, whose diversified structure makes them less sensitive to short-term fluctuations in the terms of trade. In 2013, some of the main exporters of agroindustrial products (Argentina, Paraguay) will likely experience a deterioration in the terms of trade, as will exporters of mineral and metals (Chile, Peru) and, to a lesser extent, exporters of hydrocarbons (Bolivia, Colombia, Ecuador, Trinidad and Tobago and Venezuela). Only the Central American and Caribbean countries, net importers of most food and energy products, can expect a mild improvement in their terms of trade in 2013 (ECLAC 2013c).

Figure 4. Latin America: price indexes for export commodities and manufactured goods; three-month moving average, January 2009 to July 2013 (2005 -100)



Source: ECLAC, Economic Survey of Latin America and the Caribbean, 2013.

Policy recommendations

The economies of the region should undertake structural reforms to make their exports more competitive

In a scenario where global economic activity has yet to recover, opportunities for export-led growth are increasingly few and far between, making it essential for the economies of the region to undertake structural reforms to boost the competitiveness of their exports. Many economies have taken steps to implement a series of multiple-purpose labor and tax reforms, namely, to increase tax revenues, reduce the fiscal deficit, spur employment and encourage investment.

In the area of labor reform, Mexico's case is noteworthy. In 2012, it introduced new types of contracts and payment by the hour, as well as regulations for subcontracting and telecommuting, among other measures. Brazil is implementing tax reforms that include restructuring contributions to social security with a view to benefitting labor-intensive activities. Other countries in the region have also made progress in these areas, primarily relating to the formalization of telecommuting and domestic work (ECLAC 2012a).

The tax reforms implemented in the region are a mixture of provisions aiming to strengthen investments[1] and consumption,[2] and to boost

1. The following measures are included in this category: lower taxes on the sale of industrial goods and, under certain conditions, vehicles and fuel (Brazil, Mexico, Uruguay); accelerate the depreciation of capital goods (Brazil); increase exemptions and subsidies to priority sectors and to small- and medium-sized enterprises (Brazil, Uruguay); and bolster subsidies for financing agricultural and industrial activities (Brazil).

2. The following measures are included in this category: reduce the income tax rates of salaried workers and lower-income individuals (Guatemala, Chile); increase tax credits with deductions for education spending (Chile, Mexico); exempt the value-added tax (VAT) of purchases by beneficiary families covered by income transfer programs (Uruguay).

tax revenues[3] (ECLAC 2012a). As a result of these measures and reforms, the tax burden is likely to be greater in 2013, at least in Chile, Dominican Republic, Ecuador, El Salvador, Guatemala and Peru, which could create more room for maneuver for fiscal policy, although the adverse effect on tax collection of weaker consumption must be taken into account. Finally, the volatility of export commodity prices will continue to create budgetary tensions in some economies.

Reforms are also needed in other areas, especially to ensure that fiscal resources and foreign capital inflows are channeled to areas presenting the main structural constraints to growth in the LAC economies. Bottlenecks have been identified, mainly in the areas of infrastructure, technology and education, and labor force training (OECD 2013a). The main challenges in the region appear to be the poor quality of educational systems (where access is not universal), high levels of informal employment, insufficient and scant regulation of infrastructure systems and high barriers to competition and to investment by national and foreign companies (OECD 2013b).

LAC needs to strike a balance between maintaining incentives for domestic demand and promoting policies to boost investment, especially for the production of high- productivity, tradable goods

On the domestic front, the main challenge facing the LAC countries is to determine how to change their focus from stimulating domestic demand to increasing and stabilizing investment, especially in areas that will have an impact on the competitiveness of the region's export goods and services. In the past decade, the contribution of non-export GDP (consumption plus investment) to growth followed a rising trend, with consumption making the largest contribution. This was affected by the procyclical behavior of investment, whose contribution to growth has fallen as a result of the recent slowdown. The growth of aggregate demand, and economic growth itself, by way of the so-called acceleration effect, largely explain the evolution of investment in the region (ECLAC 2013c).

The countries of the region should promote fiscal and financial policies that support investment and structural change with a view to transferring resources and labor from low productivity, non-tradable sectors to tradable sectors with high productivity. The objective would be to reduce dependence on consumption as the variable underpinning growth, which is already showing signs of exhaustion. According to ECLAC (2013c), the measures set out in Text Box 1 can support investment in high-productivity tradable sectors.

The economies of the region need to address the side effects of the unconventional monetary policies implemented in recent years

In 2012, inflationary pressure fell throughout most of LAC, making it possible to maintain benchmark monetary policy rates at historical lows, in some cases despite growth in the money supply. Other monetary policy instruments were implemented to curtail excessive liquidity expansion and thereby maintain growth in domestic demand. In this connection, many LAC countries implemented macroprudential policies, for example to increase monetary reserves, and countercyclical policies, to

3. This category includes the following measures: increase the tax rate for companies' profits and distributed dividends (Chile, Costa Rica, Ecuador, El Salvador, Guatemala); general income tax increase (Colombia, Ecuador); greater control over deductible costs and expenditures (Guatemala); higher taxes on financial services (Ecuador); foreign assets and purchases (Argentina, Ecuador); vehicle registration and circulation fees (Guatemala, Uruguay); and cigarette sales (Chile).

improve macro-financial stability and attenuate the risks associated with the performance of international financial markets.[4]

Even though most of these policies have been successful and helped to boost investor and consumer confidence, they also generated side effects that may increase the risk of unsustainability in the medium term; accordingly, these side effects need to be addressed. In some countries, the sustained growth of credits in national and foreign

Box 1. Policy measures that can strengthen investment and structural change in LAC

According to ECLAC (2013c), the following measures can strengthen investment in high-productivity, tradable sectors:

- Promote high and stable real exchange rates, using intervention measures to reduce exchange rate volatility when necessary (although such measures would be conditioned by the performance of cash inflow, which is primarily outside the countries' control).
- Create financial mechanisms that permit currency hedging.
- Use fiscal and financial policies to support investment in tradable sectors by concentrating more public investment on infrastructure, and using transparent subsidies to strengthen complementarities between private investment projects and investments in tradable sectors with stronger linkages.
- Develop national vocational training systems keyed to early technical training for young people and ongoing training for workers, especially those working in low productivity sectors, using information and communications technologies.
- Strengthen public capacities to implement these measures and to coordinate public and private investments.
- Develop countercyclical capabilities (transitional) in order to counteract or reduce slowdowns in activity level due to external and internal shocks. This implies using monetary and fiscal policies as well as public investment to accelerate economic activity in periods of crisis and, conversely, avoiding overheating and reducing debt levels in boom periods.
- With regard to macroeconomic policy, by promoting sustainable domestic and external balances over the long run, it should contribute to preventing national crises that lead to recessionary periods, slow growth and idle productive capacity. In this case, tools should include more flexible macroeconomic policies, medium- and long-term fiscal objectives, saving and transitional clauses, and some room for maneuver to address catastrophic events or persistent recessionary scenarios.
- Develop institutional capabilities in order to improve sensitivity analyses and build prospective scenarios into budgetary procedures so as to strengthen implementation of countercyclical macroeconomic policies.

Source: Prepared by the authors, based on ECLAC (2013c) data.

4. These include the following measures: implementation of reserve requirements to promote the use of national currencies (Bolivia, Paraguay, Peru, Uruguay) in order to avoid excessive household debt (Colombia) or to prevent systemic liquidity crises (Costa Rica); establishment of reserves for countercyclical purposes (Ecuador) to attenuate risks associated with interest rate changes (Bahamas, Ecuador, Paraguay), or to give more authority to central banks (Argentina, Guatemala) (ECLAC 2013).

currencies, which resulted in increased leverage of companies and households, raises the default risk in a scenario of exchange rate devaluation and higher monetary policy rates. In addition, in some cases, favorable credit conditions considerably boosted asset prices, which could intensify speculation in some markets. For example, if international oil prices start to climb in the coming months because of armed conflict in the Near East, or food prices drop from forecasted values, price levels in those countries could climb sharply. All this suggests the need to strike a balance between stimulating demand, by facilitating access to credit, and managing the risks associated with growing business and household debt and possible market overheating.

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Chapter 2: Context of the Agricultural Sector

Context of the Agricultural Sector

A sector highly vulnerable to economic, market and climatic uncertainties.

Facts

- The best way to meet the challenge of satisfying growing food demand is by boosting the productivity of the factors of production.
- Linking consumers with the food supply will become more difficult by 2050, when roughly 70% of the world's population will live in cities, farther away from the areas where foodstuffs are produced.
- Extreme weather events, unstable commodity prices and the deceleration of the global economy pose a threat to the positive performance of agriculture in Latin America and the Caribbean (LAC).
- The use of genetically modified organisms (GMOs) is increasing in some countries of the region, along with the controversy surrounding their use.
- Family farming plays a key role in improving nutrition and food security.

Trends

Data on the performance of agriculture in LAC shows that it varied from country to country

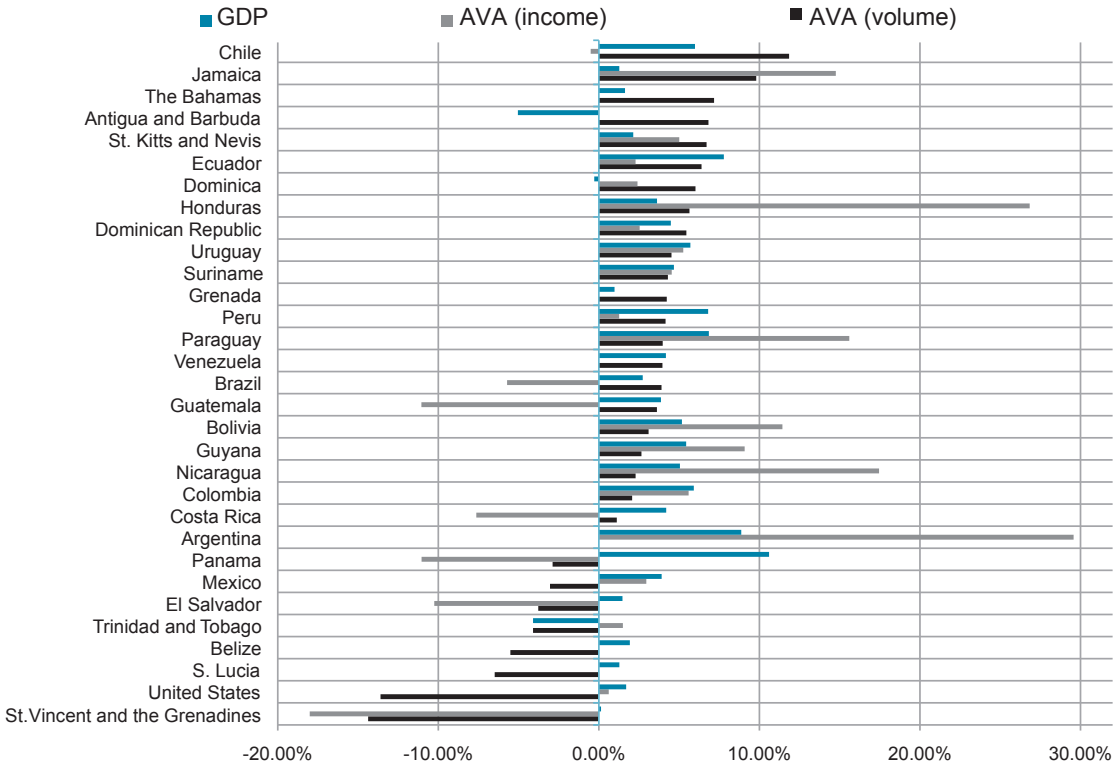
The volume of LAC's agricultural production or real agricultural value added (AVA[1]) grew by 2.7% in 2011[2], well below the growth of the region's overall gross domestic product (GDP) of 4.3%. Figure 5 shows that the growth of AVA varied from one country to another due to the very dissimilar conditions, with no clear pattern in performance across the subregion. The countries that performed best in 2011, with growth rates above 6%, were Chile (11.85%), Jamaica (9.8%), The Bahamas (7.18%), Antigua and Barbuda (6.83%), St. Kitts and Nevis (6.71%), Ecuador (6.39%) and Dominica (6.02%). At the bottom of the figure are St. Vincent and the Grenadines (-14.37%), St. Lucia (-6.49%) and Belize (-5.51%), with significant declines in AVA of 5% or more. Outside LAC, even the United States experienced a significant fall in the volume of production (-13.60%) in 2011; however, as noted below, farm incomes increased due to improvements in relative prices.

1. Refers to the AVA index in real terms, which is an index of production volume, given that each of its components is weighted for the value of production during a base period.
2. At the time of writing this chapter, no figures on AVA were available for 2012; however, reference is made to preliminary data for some LAC countries later in the text.

If the growth of AVA is compared with the growth of overall GDP in 2011, at least three groups of countries can be identified (Figure 5). In the first group of countries, AVA performed better - in some cases significantly better - than the rest of the economy, as was the case in Chile, Jamaica, Bahamas, St. Kitts and Nevis, Honduras, Dominican Republic, Grenada and Brazil. The exceptional growth of Chilean agriculture was driven mainly by its dynamic fruit exports (e.g., cranberries, cherries and table grapes) while in Jamaica it was the result of monetary expansion policies that improved the distribution of credit, which increased by 5% in overall terms, with a notable growth of 18% in credit for the agricultural sector (ECLAC 2012a).

In the second group of countries, growth of AVA was positive but less than the growth of overall GDP. This group includes Ecuador, Uruguay, Suriname, Peru, Paraguay, Venezuela, Guatemala, Bolivia, Nicaragua, Colombia, Costa Rica and Guyana. In some of these countries, the economy as a whole performed well, achieving growth rates of 7.8% (Ecuador), 6.9% (Paraguay) and 6.8% (Peru) due to the high prices of raw materials such as oil, gold and copper, and expansive policies to strengthen domestic demand, among other factors. In Paraguay, the economy benefited from the greater dynamism experienced by the agricultural sector, especially the strong upturn in the soybean sector.

Figure 5. Inter-annual growth of GDP and AVA in the Americas (in percentages, 2011). Countries in descending order of growth of AVA-Volume.



Source: IICA (CAESPA) with data from World Bank 2013, ECLAC 2013 and OECD 2013.

Finally, in the third group of countries AVA declined, even though the economy grew overall, with the sole exception of Trinidad and Tobago, where the economy also contracted. The most noteworthy case is Panama, where GDP grew by 10.6% and AVA fell by 2.88% in 2011. This situation appears to be the result of the lack of governmental programs to support the agricultural sector and, in particular, the discontinuation of the guarantee fund, the purpose of which was to support producers with the repayment of loans granted by banks or cooperatives. Exports of the following products also fell significantly: banana (22.6%); melon (22.6%); watermelon (81.1%); pineapple (26.2%); coffee (43.2%); beef (98.2%); and hides (28.9%) (ECLAC 2012b).

The volume of agricultural production may grow or decrease, but what happens with regard to the purchasing power of agricultural income? As shown in Figure 5, the performance of AVA-Income,[3] which is a measure of real income from all the factors of production (land, capital and labor), reveals that the volume of production rose in some countries and income in most of them. However, in other countries the opposite was true; in other words, volume grew and income fell (Brazil, Guatemala and Costa Rica) or the volume of production fell, but income increased (Mexico, Trinidad and Tobago and the U.S.). The reason for this was the evolution of agricultural commodity prices in relation to the evolution of prices of all goods and services (inter-sectoral terms of trade). The results show that in 2011 the agricultural terms of trade were very favorable (especially as regards incomes and purchasing power) for farmers in Argentina, Honduras, Nicaragua, Paraguay and Jamaica.

3. AVA-income measures the return on all the factors of production (land, capital and labor) and could be termed agricultural factor income, since it represents the total value generated by a production unit. It is calculated as AVA in local currency divided by the implicit GDP deflator (as an indicator of the evolution of prices of goods and services throughout the economy). Therefore, it is a measure of the purchasing power of agricultural sector incomes (Paz et al. 2009).

Preliminary growth estimates for the agricultural sector in 2012 show that the Americas were severely affected by extreme weather conditions and by a revaluation of the exchange rate, which particularly affected non-dollarized, export-oriented countries. In the **U.S.**, AVA declined by 3.7%, although the figure was lower than the one recorded in 2011 (13.6%). In **Colombia**, the main reason for the low growth of AVA was the revaluation of its currency, which had an impact on key sectors in rural areas, including flower, coffee and banana producers. In **Paraguay**, overall GDP fell by 1.8% in 2012, due to a strong contraction in the agricultural sector, the most important in the Paraguayan economy. This was due to the severe drought that affected the country at the end of 2011 and beginning of 2012, which led to a sharp decline in yields of the main crops.

In other LAC countries, the situation in 2012 was more encouraging. In **Belize**, the economy improved thanks to a recovery in its agricultural sector, due mainly to a significant increase in sugarcane production and a more moderate increase in citrus and banana production (ECLAC 2012c). **Mexico** reported a real annual growth rate of 6.7% and, despite climatic and sanitary problems, the growth rate for agriculture was higher than that for the national economy as a whole (3.9%).

Movements in international commodity prices varied from product to product

After February 2011, the FAO Food Price Index (2013a), which measures international food prices and their components, began a downward trend; however, from January to June 2013 prices rose by an average of 0.91% over the same period of the previous year, as a result of increases in the prices of dairy products (20.4%), grains (7.7%) and meat (0.9%).

The significant rise in dairy prices was due to the hot, dry weather in Australia, which led to a sharp fall in milk production and, consequently, in the production of milk by-products.

The increase in the food price index would have been greater had it not been for substantial reductions in the prices of vegetable oils and sugar. The inter-annual variation in the FAO price index up to June 2013 (2013a) was -20.4% in the case of sugar and -15.4% for oils. The falls in sugar prices were the sharpest: from an average of approximately USD 578 per metric tonne in 2011, to USD 471 in 2012, and USD 373 in June 2013.[4] However sugar prices remain 68% above the average for the base year used for comparison (USD 222/mt in 2005) (Indexmundi). Sugar production has increased significantly in countries such as Brazil, Colombia, Mexico and India, and a world record of 175 million metric tonnes is expected for the period 2013-2014 (Haley 2013).

In June 2013, the prices of palm, soybean and sunflower oil were down 39% from February 2011, 17% from April 2011 and 14% from May 2011, respectively. By contrast, the price of olive oil has risen steadily since June 2012, with a 30% increase, annualized to June 2013. The fall in soybean oil prices is due to high production in South America, while palm oil prices have suffered since European lawmakers endorsed proposals to limit the use of biofuels in that region's transport sector and the United States Department of Agriculture (USDA) forecast large soybean stocks (FEDAPAL 2013).

Decline in LAC's agrifood exports[5]

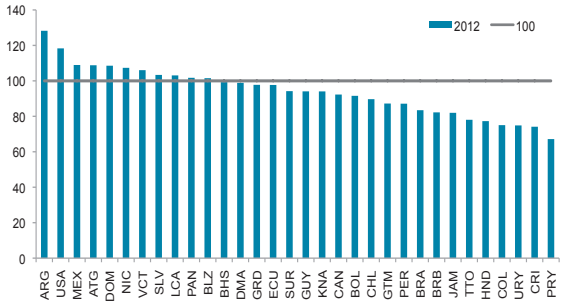
The fall in global agrifood trade is due to the economic downturn in developed countries and the slowdown in China's economy. Against this backdrop of a contraction in global trade, LAC was slowly recovering from an 11% fall in agrifood exports in 2009; however, preliminary figures for 2012 show that the region's agrifood exports fell by 0.5% (strongly affected by the reduction in the Southern Cone's exports of raw materials to China). Argentina accounts for over 20% of regional agrifood exports but, according to ITC data (2013), its exports fell by 4% in 2012.

Although the growth of LAC's agrifood exports has slowed due to the global economic conditions, from 2005 to 2012 they increased at an average annual rate of 11.4%, higher than the 9.9% average growth rate of global agrifood exports, according to CAESPA calculations, based on ITC figures (2013).

4. Sugar, Free Market, Coffee, Sugar and Cocoa Exchange (CSCE), contract No. 11 nearest future position, US cents per pound.

5. LAC trade refers to the aggregate trade of 30 countries: (Argentina (ARG), Bahamas (BHS), Barbados (BRB), Belize (BLZ), Bolivia (BOL), Brazil (BRA), Chile (CHL), Colombia (COL), Costa Rica (CRI), Dominica (DMA), Dominican Republic (DOM), Ecuador (ECU), El Salvador (SLV), Grenada (GRD), Guatemala (GTM), Guyana (GUY), Haiti (HTI), Honduras (HND), Jamaica (JAM), Mexico (MEX), Nicaragua (NIC), Panama (PAN), Paraguay (PRY), Peru (PER), St. Lucia (LCA), St. Vincent and the Grenadines (VCT), Suriname (SUR), Trinidad and Tobago (TTO), Uruguay (URY) and Venezuela (VEN). Data on these countries is available for the entire 2005 -2012 period in the International Trade Center (ITC) database.

Figure 6. Real effective exchange rate index for LAC's agrifood exports, 2012 (2005=100).



Source: IICA (CAESPA) based on United Nations data (COMTRADE), exchange rates from ERS/USDA and the World Bank and Central Banks for some Caribbean countries, and inflation figures from IMF and EUROSTAT.

The appreciation of local currencies against the US dollar (the most prolonged since the 1970s) has made the agrifood exports of most LAC countries less competitive and benefited the agricultural exports of the United States. Of the 33 countries included in the analysis, 21 experienced a real effective appreciation[6] of their local currencies, ranging from 40% in Venezuela to 0.7% in the Bahamas (Figure 6). In Trinidad and Tobago, Honduras, Colombia, Uruguay, Costa Rica and Paraguay, the real effective appreciation has been more than 20% since the base year of 2005. In another group of 10 countries, agricultural exports benefited from the devaluation of their currencies against those of their main trading partners. Argentina leads this group with a 28.2% devaluation rate with respect to the base year of 2005, followed by Mexico (8.9%), Antigua and Barbuda (8.8%) and Dominican Republic (8.6%).

6. This means that a country's local currency is stronger, in terms of purchasing power, than the currencies of its trading partners, which in turn implies that the country's exports are perceived as being more costly abroad. CAESPA's calculations use bilateral exchange rates (local currency/foreign currency), deflated by the consumer price index of each country and weighted according to their main trading partners' share in the agricultural exports of the last three years.

Prospects

International prices will remain high in nominal terms but fall in real terms

International commodity prices will remain high in nominal terms (without taking account of inflation) in the coming decade (2013-2022) with respect to the previous decade (2003-2012), a period that included the price peaks stemming from the crisis in 2007-2008, the heat wave in the former Soviet Union countries and the droughts in the U.S. and in Europe (OECD/FAO 2013). However, if the base period of comparison is changed to 2010-2012, only the nominal price projections for dairy products, fishery products and biofuels will be higher than for that period.

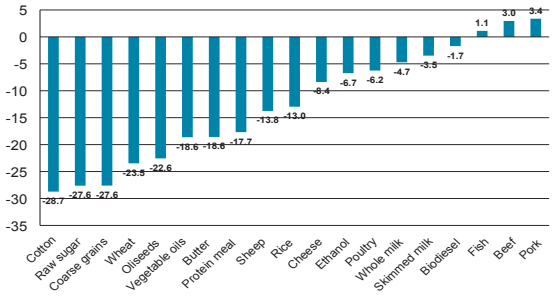
In real terms (discounting the effects of inflation), all commodity prices projected up to 2022 (with the exception of beef, pork and fish) will be below the average prices of the previous decade (see Figure 7).

Pork, beef and fish prices are projected to rise by 3.4%, 3% and 1.1%, respectively, over the coming decade.

Among the prices that are expected to fall by more than 20% in real terms are those of cotton (29%), raw sugar (28%), coarse grains (28%), wheat (23%) and oilseeds (23%).

In the shorter term, according to the USDA's price forecasts for the 2013-2014 harvest, record production levels are expected to push down the prices of most grains and oilseeds. As a reference, maize prices in the U.S. are projected to be USD 189/t for the 2013-2014 harvest period, well below the price levels for the 2012-2013 harvest (between USD 266/t and USD 301/t). Soybean and wheat prices are expected to fall by 26.6% and 11.4%, respectively. The exception is rice, the price of

Figure 7. International prices of agricultural commodities in real terms (percentage changes 2013-2022 v. 2010-2012)



Source: OECD/FAO 2013.

which will increase by 2% in 2013-2014, to USD 335/t, barely above the levels seen in the last five years (Glauber 2013).

On the other hand, the prices of meat, eggs and dairy products will tend to rise in the short term, driven by the record prices of raw materials used for animal feed such as maize, soybean and alfalfa. For example, in 2012 the milk-to-animal feed price ratio in the United States fell to 1.52, when historically this ratio has been even more than 3 (Cessna). Given the longer response times for livestock production, beef prices will likely increase more slowly than other meats in reaction to the shock of high animal feed prices. The pressure on production costs of meat and dairy products will tend to ease toward the end of 2014, when the effects of lower raw material prices are felt.

World cotton stocks have increased for the most part, because of China's policies designed to support its domestic prices, which are well above international prices. At the same time, Brazil (the Southern Region's leading cotton producer) has reduced its cotton production by nearly 30%, attracted by better maize and soybean prices. Adjusted stock-to-use ratios will support international prices during 2013; however, the lower prices expected for maize and soybean will push cotton prices upwards in the short term, but much will depend on whether or not China maintains its policy of supporting domestic prices (USDA 2013).

The prices of tropical products, such as bananas, coffee and cocoa are also expected to fall during the 2013-2018 period by an annual average of 3.3%, 2.9% and 3.7%, respectively (IMF 2013). Coffee prices will remain low despite production cuts resulting from the effects of coffee rust disease in Central America, Colombia and Peru; however, these cuts will be offset by a record harvest in Brazil for the 2013-2014 period (Safras and Mercado 2013). Nevertheless, even this forecast is uncertain, as the most recent USDA projections predict a 3% fall in world coffee production, of which 1.7% corresponds to declining production in Brazil (FAS 2013).

Peaks or cycles in international prices will become more frequent and more pronounced

International prices vary from month to month, in response to changes in the conditions of supply and demand that are specific to each product, but are also influenced by variables common to all products (e.g., macroeconomic, climatic, political and social factors). Some variables have prolonged effects on prices and therefore affect the long-term trend. Others have impacts in the short term, affecting the volatility and seasonality of prices.

It is important to emphasize that international prices have been much less volatile over the last two years,[7] less than they were even before the crisis of 2007-2008. Volatility refers to fluctuations in prices, which may rise or fall to different degrees, due to random factors with very short-term effects, many of which are impossible to predict or remedy. Indeed, the volatility[8] seen in international commodity prices during the last 28 months (up to April

Box 2. Energy prices and input prices will probably remain high.

Prices rise in response to strong growth in the global demand for energy and agricultural commodities, which increases production costs, puts pressure on farmers' operating margins and affects the supply response. This, in turn, is one of the factors that keeps agricultural commodity and food prices high in nominal terms, in the long term. Thus, for example, in June 2013, FOB prices of urea and diamonic phosphate stood at USD 321/t and USD 478/t, respectively in the U.S., more than double the levels seen before the crisis (IndexMundi 2013).

2013) is at a historical low:[9] oranges 6.9%, banana 4.8%, cocoa 3.7%, coffee 2.6%, sugar 2.5%, wheat 2.5%, rice 2.3%, maize 2.1% and soybean 2.1%.

Seasonality,[10] another source of price variation, has also tended to decrease over the years. For example, the standard deviation of prices due to seasonality for perishable products, such as oranges and bananas, was 14.2% and 11.8% in the 1980s, but in the last 28 months (to April 2013) fell to 9.3% and 2.7%, respectively. Non-perishable commodities enjoy more stable prices during the year, but seasonality has even declined in their case in recent years. For example, the standard deviation of international prices due to seasonality is currently 1.7% for maize (whereas in the 1980s it was 3.7%), 1.3% for coffee (2.8%), 1.7% for wheat (3.0%) and 2.3% for soybean (2.8%). Trade liberalization, information, greater competition in agricultural markets, improved storage technologies and increased investment in refrigeration infrastructure, all help to maintain a greater balance between supply and demand for products, which allows for greater price stability during the year.

The main components of price instability are cycles or peaks in international prices, which have become greater and more frequent in recent years (see Text Box 2). These cycles, unlike the volatility and seasonality discussed previously, are the result of variables with more prolonged effects on supply, demand and prices. Pests and diseases or extreme climatic conditions, which are geographically localized, are examples of variables that would have a medium-term impact, specific to each crop or agricultural activity. Other variables, such as changes in interest rates, exchange rates or the economic recession would have broader effects, common to all products.

Table 1 shows the peaks in international prices, which have increased dramatically for most of the selected products. Coffee prices deviated 36% from their long-term trend during the last period analyzed (2011-April 2013), a percentage never seen before. This cyclical variability of coffee prices will be further accentuated over the next three years, due to the effects of coffee rust disease in Central America, Colombia and Peru.[11] With regard to maize, the effects of one of the worst droughts in the history of the U.S. resulted in prices deviating 30.6% from their long-term trend during the last period, a figure three times

7. The press and even many technical journals mention an increase, not a reduction, in volatility but this is because they generally refer to price changes from any source or of any type. In this section, a distinction is made between changes due to a long-term trend, and those explained by seasonality and price cycles; the remainder are due to the erratic or random component that is termed volatility in this section.
8. Calculated as the standard deviation of the irregular component of the series after isolating the trend, cycle and seasonality of the series, using the X12-ARIMA econometric procedure (US Census Bureau).
9. For the periods 1991-2000 and 2006-2010, the volatility rates were (8.8% and 6.8%), (10.8% and 9.0%), (3.2% and 3.7%), (5.7% and 3.5%), (4.1% and 3.6%), (3.0% and 4.6%), (3.7% and 9.8%), (2.4% and 3.0%) and (2.7% and 3.5%) respectively.
10. Seasonality is a distinctive feature of agriculture, because harvests last for a few months, whereas products are consumed throughout the year, and prices increase during periods of scarcity and fall during periods of abundance.
11. In other words, coffee prices are below their long-term trend, but will tend to rise due to the effects of coffee rust disease on the world coffee supply.

Table 1. International price cycles for selected products[a] (January 1980-April 2013).

Product	1980-1990	1991-2000	2001-2005	2006-2010	2011-Apr 2013
Coffee	18.7%	23.5%	7.7%	13.7%	36.0%
Maize	14.1%	15.4%	10.3%	35.3%	30.6%
Sugar	36.7%	12.9%	12.4%	32.0%	30.1%
Wheat	7.6%	9.9%	9.0%	33.2%	21.9%
Soybean	15.1%	8.9%	17.3%	31.2%	18.9%
Cocoa	11.2%	8.5%	13.5%	13.1%	13.7%
Rice	12.0%	9.1%	4.6%	43.7%	9.2%
Oranges	3.7%	6.4%	9.3%	19.4%	5.7%
Bananas	5.3%	7.9%	14.4%	9.1%	5.4%

Source: CAESPA, based on IMF data 2013.
Note: Data related to standard deviations of changes around the long-term trend (upward or downward), after eliminating the components of volatility and seasonality. The X12-ARIMA method (US Census Bureau) and the Hodrick-Prescott filter were used.

[a] Maize (U.S. No. 2 yellow), FOB prices Gulf of Mexico); Coffee (other mild Arabica varieties, cash price of the International Coffee Organization, New York); Soybean (Chicago futures contract - first forward contract); Wheat (hard wheat No. 1, FOB price Gulf of Mexico); Banana (Central America, Ecuador, FOB price in US ports.); Rice (5% broken, white, Thailand); Sugar (Free Market, Coffee, Sugar and Cocoa Exchange, contract No. 11 nearest future position); Oranges (CIF price in France); Cocoa (International Cocoa Organization, CIF price in European ports).

higher than between 2001 and 2005. For their part, sugar price cycles have responded to price stimuli applied in the past that significantly boosted the sugarcane harvests of key producers such as Brazil, Thailand, Australia and Mexico, creating a world sugar surplus. At the same time, China reduced its international sugar imports, because of increased domestic stocks. Finally, the price cycles for wheat, soybean, cocoa, rice, oranges and bananas are more similar to those observed in the past. The reasons for the scale and frequency of price cycles are explained in Text Box 2.

Agriculture, particularly family farming, will be essential for improving nutrition and food security

Over the last two decades, LAC has made significant progress in reducing hunger, under-nutrition and malnutrition; however, the percentage of children suffering from emaciation and moderate or severe growth retardation continues to be high. Despite the advances achieved by the region as a whole, several countries show alarming levels of malnutrition: more than 30% of the population in Haiti and Guatemala, and more than 20% in Paraguay, Bolivia and Antigua and Barbuda (FAO 2013b).

At the same time, the number of people affected by food insecurity is greater in rural areas than in urban ones (on average 15 percentage points higher); it is also highly seasonal, due to the limited availability of, and accessibility to, food during non-harvest months (FAO 2013b).

In addition to malnutrition, the rapid increase in the prevalence of overweight and obesity is emerging as a new health threat in LAC. The figures for the region are comparable to those of developed countries (around 40 out of every 1000 inhabitants) expressed in terms of the indicator of years of life lost due to disability, overweight and obesity (FAO 2013b).

In this context, it is important to emphasize the enormous potential of agriculture –particularly family agriculture– to influence nutritional levels in LAC. An obvious way to have an impact in this regard would be to improve productivity in family agriculture, which would translate into increased food availability and higher incomes for rural

families. If these efforts were complemented with actions to educate women and give them autonomy, improve health and environmental conditions, promote a shift toward a diet of healthy foods and supplementation with micronutrients, and provide care for children and the family in general, they would bring about a sustainable improvement in the nutritional status of the rural population (Smith and Haddad 2002). Increased food production, together with the efficient operation of markets, is the appropriate formula for a sustainable food supply throughout the year in rural areas (Haddad 2002; IFPRI 2012).

Another way to improve nutrition in LAC is through increased production of foods with a high nutrient content. For example, native potatoes are known to have excellent organoleptic properties and provide significant quantities of protein, fiber, minerals, carotene and natural antioxidants (Monteros *et al.* 2011). Many other products rich in micronutrients are produced by family agriculture, such as beans (67%), yucca (84%), maize (49%) and milk (52%) in Brazil; maize and beans (30%) in Colombia; potato (64%), onion (85%), maize (70%) and mutton (83%) in Ecuador (FAO and IDB 2007).

Family agriculture tends to use mixed and integrated production systems, which are more resilient to adverse climate conditions (Altieri 2011). These systems provide a constant source of income for the family (Seo 2010; Kurosaki 2010) and are labor-intensive; therefore, they create employment opportunities on the farm (Immink and Alarcon 1993), reduce risk through diversification –equivalent to having a type of insurance when market failures occur– and increase the supply of nutrient-rich foods for the family (Immink and Alarcón 1993).

Bilateral and regional negotiation processes will intensify

The region is engaged in an intense process to conclude agreements on trade, economic association and customs unions, some of which will enter into force in the short term while others are currently under negotiation. Among the most important are the Transatlantic Trade and Investment Partnership (TTIP) between the U.S. and the EU, the Pacific Alliance, the Trans-Pacific Strategic Economic Partnership, the negotiations between various LAC countries and the European Free Trade Association and with the Bolivarian Alliance for the Peoples of America (ALBA), as well as Bolivia and Suriname's negotiations for accession to MERCOSUR. In addition to regional negotiations, various bilateral agreements are being negotiated or will enter into force either this year or next year, including the Argentina-China customs agreement and the Peru-Persian Gulf States, Peru-Japan, Colombia-Israel, Japan-Singapore, Chile-Thailand, Central America-Korea and Ecuador-EU negotiations, among others.

It is estimated that, once fully implemented, the recently announced **Transatlantic Trade and Investment Partnership between the United States and the European Union** could generate annual earnings of up to 119 billion Euros for the EU and 95 billion Euros for the U.S.. Around 80% of the benefits would come from the reduction of non-tariff barriers (through the harmonization of standards) and from the liberalization of trade in services and public procurement. According to estimates from the Center for Economic Policy Research, processed food exports from the EU would increase by 9%.

This agreement could lower prices across the board, lead to increased competitiveness in the business sectors of both trading partners and lend renewed momentum to the Doha

Round of multilateral negotiations. If this agreement is signed, the main challenge will be the potential exclusion and diversion of LAC's trade, given that the region's most important trading partners –in terms of exports and imports– are the U.S. and the EU. The effects would vary depending on the progress made in the agricultural negotiations, where the greatest difficulties would lie in reaching consensus on issues such as geographical indications, protection of intellectual property rights and scientific justification of non-tariff barriers. It is not clear how a scenario in which these giant trading blocs opt for increased trade liberalization and fewer subsidies will affect Latin American exports. It is possible that the negative effects of trade diversion could be offset by the creation of trade, given that, with the increased demand for imports, there would also be more trade opportunities for LAC.

The greatest challenge in the negotiations between the EU and the U.S. is the reduction of non-tariff barriers. Latin American countries that have trade agreements with the EU and US would benefit from the increased growth of trade within a framework of clearer regulations (Langhammer 2008). The negotiations on health and consumer protection standards (for example, intellectual property) would have implications for third countries, which would have to adapt to the new requirements in order to participate in trade.

On another front, the presidents of the four Latin American countries that comprise the **Pacific Alliance** –Chile, Colombia, Mexico and Peru– will sign an agreement to eliminate tariffs on 90% of the goods traded among them. The group also proposes to remove tariffs on the remaining 10% of goods within seven years. These countries are linked not so much by their geographic proximity but by their shared interests, since they aspire to move rapidly toward the creation of a common market. All four countries are advocates of free trade, with rapidly growing economies and trade links with China and have a combined GDP of two trillion dollars, or 35% of the region's total (almost equal to Brazil's GDP). This group of countries, which Costa Rica joined recently, has achieved major progress in integrating the stock markets of Chile, Colombia and Peru, simplifying border procedures and harmonizing standards such as labeling and rules of origin.

The **Trans-Pacific Partnership (TPP)** is another agreement of great commercial and economic importance for LAC. The original signatories were Brunei, Chile, New Zealand and Singapore, countries that share a number of characteristics: they are open and dynamic economies, they promote unilateral liberalization policies and are members of APEC. Other countries that have since joined the TPP are Australia, the US, Malaysia, Peru, Vietnam, Canada and Mexico, while Japan was welcomed to the group during the organization's Eighteenth Round of negotiations, held from July 15-24, 2013 in Kinabalu, Malaysia. With Japan's accession to the group, the TPP will account for 40% of global GDP and one-third of world trade. The most controversial issues under negotiation are intellectual property, the competitiveness of state enterprises and the environment. The rapid pace of the negotiations suggests that they could conclude this year. The Nineteenth Round was held on August 23, 2013 in Brunei.

Among the bilateral agreements concluded during 2013 was the customs agreement signed between Argentina and China, which will come into effect in 2014. Implementation of this agreement will facilitate trade with greater controls on over-invoicing in trade and the triangulation of goods. The agreement is expected to give greater equilibrium to the balance of Argentina, whose second most important trading partner is China.

LAC's agrifood market offers great potential for intra-regional growth

There is much rhetoric but little action in LAC with regard to the issue of economic and trade integration. Intra-regional agrifood exports account for just 15.9% of LAC's total agrifood exports (Figure 8), compared with nearly 60% in the EU and 50% in Asia. In fact, inter-regional trade in the Southern Region is barely 7%. In response to the downturn in their leading markets (U.S. and EU), the LAC countries are looking for new markets for their agricultural exports. Intra-regional trade increased, but not sufficiently to reach its full potential, given that the region is enjoying macroeconomic stability, incomes are growing rapidly and the population's eating habits are changing.

The comparison of the figures for 2003-2005 and 2009-2011 shows that intra-regional trade increased by 1.7% (from 14.2% to 15.9%), while exports from LAC to Asia increased by 7.6%, in both cases to the detriment of the share of exports to North America, which fell by 4.3% during the same period. In terms of growth, intra-regional agrifood exports are growing at an average annual rate of 14.1%, while exports to Asia are increasing at an average annual rate of 17.3%.

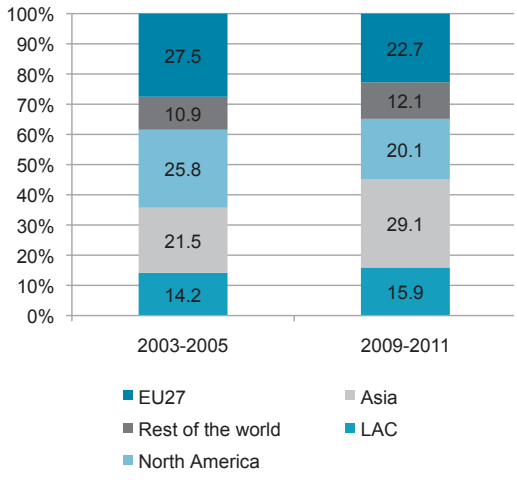
Barriers to exports are the main obstacle preventing LAC countries from taking advantage of the potential of intra-regional trade. At the global level, LAC's agricultural exports face higher barriers than any other region except East Asia and the Pacific (Chaherli and Nash 2013). Although tariff barriers to agricultural trade are low among countries in the region, general restrictions on exports are very high, suggesting the presence of non-tariff barriers. For agricultural products, at least, this is due to the fact that trade agreements have not been successful in reducing trade barriers among the LAC countries.

The literature also mentions the high costs of transport services in the Southern Cone as a limiting factor. In several countries, the common denominators are the high logistical costs that are difficult to quantify, in the form of delays, losses and bribes, in addition to deficiencies in port infrastructure and storage facilities (Chaherli and Nash 2013).

It is important to recognize that the biggest change in the destination of agrifood exports has occurred in the Southern Cone countries, which increased their percentage of exports to Asia from 29% to 38% during the same period of analysis (taking market share away from the EU). This represented an increase of USD 29 billion in agrifood exports to Asia, particularly to China.

China is currently a major destination for LAC's exports, particularly those from the Southern Cone. It is also the main market for the total exports of Chile and Peru, and the second market for Colombia. At the same time, it has become Brazil's main trading partner and the second in the case of Venezuela and Argentina. In 2012, China purchased one-third of Uruguay's soybean exports and during the first half of 2012, 24.3% of Brazil's agricultural exports. Furthermore, agricultural trade between China and Brazil has doubled in the last three years, increasing from USD 8 billion in

Figure 8. Destination of LAC's agrifood exports by region, 2003-2005/2009-2011.



Source: IICA (CAESPA) based on United Nations data (COMTRADE) 2013.

Box 3. Changes in the composition of LAC's exports based on the products in which the countries specialize.

In countries with large mineral or oil reserves, such as Chile, Peru, Colombia, Ecuador and Trinidad and Tobago, there is an increasing concentration on metal or fuel exports, to the detriment of the share of food exports. By contrast, in the Southern Cone, where countries are highly specialized in agricultural production, food exports have increased their share by up to 14% since 2002 (e.g., in the case of Uruguay). Similarly, the share of food exports in Central American countries has increased by up to 11 percentage points, for example in Honduras, where food exports accounted for 72% of total exports in 2011 (based on IDB data).

2008 to USD 18 billion in 2011 (the main export product is soybean, followed by wood pulp and cellulose and sugar). Brazil is the second largest supplier of soybean to the Chinese, meeting 36.9% of local demand, slightly less than the United States, which supplies 42%.

Conclusions

In the coming decade, agricultural prices will remain high in nominal terms but fall in real terms. This means that countries will have to redouble their efforts to improve investment, productivity and efficiency in order to ensure more sustainable sources of prosperity in rural areas. Long-term sustainability calls for improvements in the quantity and quality of the food produced, food that must be affordable and produced using fewer resources and environmentally friendly practices.

Agricultural systems across the globe, and therefore the prices of agricultural products, are becoming increasingly unstable, thereby creating a very difficult environment for investment and decision-making. As was noted in this chapter, the main components of price instability are price cycles and peaks, while seasonality and volatility have tended to decline over time. It is necessary to adopt appropriate measures to ensure greater price stability and make agriculture more resilient to climatic and economic risks, which have the most prolonged effects on prices. Given the global nature of these problems, it is essential to strengthen international and regional coordination in order to respond in a timely and effective manner to the effects of climate variability, price peaks, recessions in developed countries and slowdowns in emerging economies.

At 15.9%, intra-LAC agrifood trade remains at a very low level compared with other regions of the world and is increasing at an average annual rate of 14.1%, while LAC's agrifood exports to Asia are expanding more rapidly (average annual rate of 17.3%). This is due to the fact that trade agreements have not succeeded in reducing trade barriers among LAC countries, particularly in the case of agricultural products. Additional constraints include the high logistical and transportation costs between countries in the region. Those costs, which are difficult to quantify, are caused, among other things, by delays, losses and bribes, as well as deficiencies in port infrastructure and storage facilities.

Policy recommendations

In times of great uncertainty and complexity, it is essential that countries recognize the importance of investing more time and resources in strategic thinking and prospective analysis in order to anticipate future trends effectively and improve the decision-making process by adopting a strategic, long-term, holistic, multidisciplinary and multidimensional approach. In doing so, countries must define clearly the goals, outputs and results they wish to achieve as a society in the long term, and implement accountability systems to gauge the level of progress made. The active participation

of the public and private sectors is key, as are processes that value and harness local expertise and combine it with scientific knowledge.

As regards the limited integration of intra-regional agrifood trade (15.9%), LAC countries must redouble their efforts to strengthen economic integration as a crucial step toward creating economies of scale and a more favorable context for competing in other markets outside the region. This calls for actions to promote better coordination among countries, reduce non-tariff barriers to trade, harmonize regulations, implement fewer and more transparent customs procedures and invest in infrastructure to improve the region's physical integration.

The fact that agricultural growth in the countries of the region is so heterogeneous suggests that more dissemination, sharing and adoption of (public and private) good practices are needed, along with improvements in the allocation and execution of public resources, which would help set the countries on the path to better agricultural performance.

Finally, the adoption of integrated agricultural systems (which are richer in nutrients and offer a more sustainable source of employment and income for family agriculture) calls for more expertise than traditional monoculture systems. Systems should be adopted that help disseminate information for each specific agro-ecological zone from farmer to farmer. In addition, governments must create an institutional framework for an effective transition, through investment in public goods such as agricultural extension services, storage facilities, rural infrastructure and access to local and regional markets.

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Chapter 2.1: Agriculture

Agriculture[1]

The growth of regional agricultural production slowed during 2012 but an upturn is forecast for 2013. This trend will gain further momentum in 2014 and thereafter, thanks to a rebound in world growth, especially in the emerging economies.

The impact of climate variability on production and the weak growth in global agricultural trade were the main factors responsible for the deceleration of growth in agricultural production.

Facts

- Weak world growth in 2012, especially in the most developed countries and China, resulted in a deceleration in world trade flows, but non-tariff barriers to agrifood trade also increased.
- Increased climate variability, rather than climate change, has reduced the yields of several major crops, a situation aggravated by the rising cost of inputs.
- Falls in the international prices of the main agricultural commodities allay political concerns about food security but reduce producers' incomes.
- Concern over the state of natural resources and sustainable development is driving green growth strategies and similar initiatives, which seek to reduce dependence on fossil fuels to meet energy needs and use more biomass for food production and non-food uses.
- In the Latin American and Caribbean (LAC) countries, major initiatives are underway to promote innovation in agriculture with an emphasis on family farming; however, public investment in research, development and innovation (R+D+i) in regional agriculture has yet to take off.

1. In this chapter, 'agriculture' is used to refer only to the primary phase of crop production. Other activities included in the concept of expanded agriculture (stock raising, fishing and forestry) will be addressed in subsequent chapters.

Trends

Crops produced in LAC were affected by the unfavorable global conditions in 2012

Following a recovery in 2010, agricultural production performed well in 2011 in all the subregions of LAC, despite the slowdown in the growth of the global economy (see Figure 1 of Chapter 1). The exception was Mexico, where production declined in value by -7.4% at constant prices (Table 2), mainly due to a fall in the volume of grain production.

Table 2. Value of crop production.

Gross production (constant 2004-2006, in millions of US dollars)					Annual growth, percentages		
	2008	2009	2010	2011	2009	2010	2011
Andean	19629	19943	19311	19835	1.6	-3.2	2.7
Caribbean	3353	3322	3406	3617	-0.9	2.5	6.2
Central	5572	5404	5618	6143	-3.0	4.0	9.3
Mexico	17910	16868	17654	16339	-5.8	4.7	-7.4
Suouthern	76470	69492	80457	85145	-9.1	15.8	5.8

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

In 2012, primary agricultural production in LAC was affected by the poor performance of the world economy. The unfavorable economic environment was compounded by adverse climatic conditions and plant health problems in some countries.

The **Southern Region,** an area that is crucial to the overall performance of Latin America and the Caribbean because of its greater relative weight, was the subregion with the lowest growth in 2012, in contrast with the previous year. In part, this was due to the effects of the slowdown in the most developed economies and in some of the BRIC countries (Brazil, Russia, India and China), especially China and Brazil. In Brazil, for example, agricultural production fell by 2.3% in 2012 (IBGE 2013), due to a decline in the production of the main crops, except coffee and maize. In Argentina, on the other hand, production of wheat, maize and barley grew, although soybean production fell, despite the adverse climatic conditions observed during the 2011-2012 farming year (SIIA 2013). In Uruguay, production grew, but 2012 was a bad year for agriculture in Paraguay, which suffered an 18% drop, due to the severe drought and high temperatures that affected the agricultural sector. In 2012, the area under cultivation in Chile shrank in comparison to 2011, with falls in the production of important crops such as wheat, oats and barley, although rice production was up.

The performance of agriculture was different in the **Central Region** and **Mexico**. Mexico's agriculture performed better during 2012 (7.1% growth according to INEGI 2013), in comparison with the -7.4% fall seen in 2011. In Central America, the trends offer little reason for optimism. In Costa Rica, the pace of agricultural growth slowed during 2012 (1.7%), after reaching 2.4% in 2011. In Guatemala, crop production did not grow. Honduras and Belize showed moderate growth during 2012, while Panama experienced a contraction in its agricultural production.

In the **Andean Region**, production in Peru was buoyant in 2012, growing at a rate of between 2.2% and 5% according to available figures (MINAG 2013). In Colombia, agricultural output grew by 2.6% the same year based on a significant increase in permanent crops (DANE 2013), while in Bolivia production of soybean, quinoa and maize rose, although wheat production fell. For its part, Ecuador's agriculture showed signs of stagnation in 2012, affected by lower prices and a decline in coffee production. In Venezuela, positive results were

observed thanks to credit programs directed at small- and medium-scale producers, although no statistics are available for the country's overall crop production.

In the **Caribbean**, Hurricane Sandy had a very negative impact on agriculture in Cuba and Haiti during the second half of 2012, although grain production in the Dominican Republic benefited from the rainfall. Preliminary results for most Caribbean countries suggest stagnation or slow growth in agricultural production (Haiti, Grenada, St. Vincent and the Grenadines, Dominica, Barbados, St. Lucia and Suriname), except in the Dominican Republic (4.1% growth) and Guyana.

Climate conditions are conducive to outbreaks of pests and affect agricultural production in LAC

In 2012, climate variability was once again the factor that most severely affected crops in LAC. Floods and droughts throughout the subcontinent not only had a strong impact on the production of grains and oilseeds, but also on tropical products such as coffee, banana, citrus and sugar cane.

In the case of coffee, a combination of climate variability, low prices and pests, resulting from poor management of coffee plantations (low investment and failure to renew coffee plants) and the lack of continuity in government pest control programs triggered a major outbreak of coffee leaf rust in Central America, Dominican Republic, Peru and Colombia, though with less impact in the last of these countries. The biggest impact of this pest will be felt in 2013 but it will continue to cause problems in the years ahead.

In addition to coffee leaf rust, other diseases and pests caused major losses in LAC, especially in banana crops (sigatoka), citrus trees (yellow dragon disease), palms (red spider mite) and maize (tar spot disease).

Modern technology helps tackle climate-related problems in LAC's agricultural crops

Technology, particularly biotechnology,[2] has become a vital element for addressing certain extreme climate conditions (such as water shortages) and outbreaks of pests and diseases, through the development of resistant varieties. For example, the US recently approved the release of some maize varieties and Nicaragua improved its bean productivity with the introduction of a drought- and pest-resistant variety. In LAC, some varieties resistant to drought and salinity are already being assessed by the respective national biosafety commissions, with positive results in terms of improved productivity.

Although LAC continues to debate the benefits of the use of biotechnology tools and genetically modified organisms (GMOs), several countries regard biotechnology as a strategic area that helps to close productivity gaps in the agricultural sector, adapt agriculture to climate change, control pests and diseases more effectively and achieve more efficient use of inputs (fertilizers, soil, water, etc.), which accounts for the rapid growth in its use in the region (Table 3).

2. The tools offered by biotechnology (tissue culture, molecular markers, genetic modification, etc.) are driving the higher productivity of the agricultural sector in the world's leading food-producing countries, including Argentina and Brazil.

In fact, transgenic soybean is now grown widely in Brazil, Argentina, Uruguay, Paraguay and Bolivia. In the United States, 94% of the soybean crop is transgenic. GM maize, canola and cotton are also grown in the region (BBC 2013).

Table 3. Increase in the surface area of genetically modified crops in America: a reality[a].

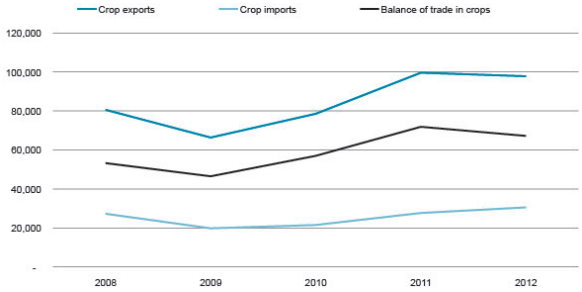
	2008	2009	2010	2011	2012
Central*	10,600	16,600	15,400	30,029	30,400
Andean*	628,000	774,000	887,000	949,300	1,050,000
Southern**	40,151,000	45,772,200	52,016,678	58,131,000	65,340,000
Northern*	70,195,000	72,273,000	75,671,000	79,577,500	81,300,000
Total	110,984,600	118,835,800	128,590,078	138,687,829	147,720,400

Source: cPrepared by IICA (Xinia Quirós) based on data from ISAAA 2012, USDA 2012 and Poca 2013.
[a] Event: Herbicide tolerance; insect resistance; herbicide tolerance / resistance to insects. Crops: soybeans, corn, cotton and canola.
* Central (Honduras and Costa Rica); Andean (Colombia and Bolivia); South (Argentina, Brazil, Chile, Paraguay, Uruguay); North (Canada, USA, Mexico).

Agricultural trade: the balance of trade weakened in 2012

Following two consecutive years of growth (2010 and 2011), the value of LAC's agricultural exports fell by 1.8% in 2012, while imports continued the upward trend that began in 2009. This resulted in a slight reduction in the positive trade balance that LAC had achieved for crops, which stood at USD 67 billion (see Figure 9). In fact, agricultural imports grew at a rate of 10% during 2012, with particularly strong growth in grain imports in Venezuela (almost 90%) and major increases in imports of oilseeds in Mexico and Brazil (where harvests were affected by drought), as well as fruits in Venezuela and Mexico.

Figure 9. Value of the balance of trade in crops in LAC (in millions of USD).



Source: IICA (CAESPA) with data from ITC.

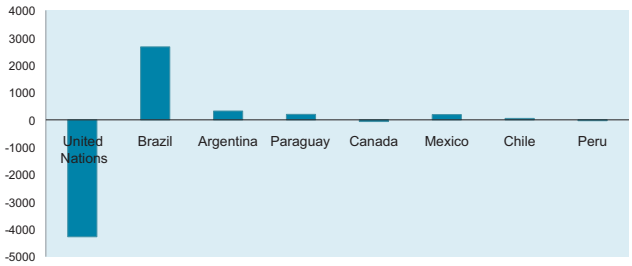
The fall in the value of crop exports in 2012 was due to a 20% drop in coffee exports (basically from Brazil and Colombia, the region's leading exporters), which the 6% growth in exports of oilseeds and live plants was insufficient to offset. Brazil was responsible for the increase in oilseed exports, which account for 69% of the region's exports, compensating for the dip in Argentina and Paraguay's exports (3% and 37%, respectively).

On the other hand, the integration efforts have not led to a significant increase in agricultural trade between subregional blocs (see the chapter on the Context of the Agricultural Sector). The weak performance of the European Union and US economies notwithstanding, they continue to be the main destination for LAC's agricultural exports (37% and 32%, respectively in 2012). China has become the third most important destination for LAC's agricultural exports (22%), followed by Russia and Japan (6% each). However, new forms of international exchange are being tried out in the region, especially "energy for food" programs, which are not necessarily based on market principles, but rather on non-economic considerations, such as food security, fair trade, solidarity and even ideological affinity.

Some cases in point are the initiatives under way between Venezuela and countries such as Argentina, Bolivia and Nicaragua (see the chapter on Policies).

The severe drought that affected the United States resulted in a sharp contraction in maize exports (38%), creating a window of opportunity for other countries in the region (Figure 10). According to ECLAC figures, Brazil exported almost 20 million tonnes of maize in 2012, nearly double the 2011 figure. For its part, Argentina exported just over 16 million tonnes, although for the first time Brazil's exports were bigger, due to the severe drought that affected Argentina's harvest and its restrictions on exports of the grain. It should be noted that Brazil has fewer advantages than Argentina where maize production is concerned: although it has large tracts of land available, its warmer, more humid climate makes the crop costlier to grow because of the need to apply larger quantities of herbicides and pesticides.

Figure 10. Variation in the value of maize exports in 2012 (in millions of dollars).



Source: Prepared by IICA (CAESPA) with data from ITC.

U.S. exports are expected to continue to fall in 2013, to their lowest levels since 1970, with Brazil set to become the world's leading maize exporter (USDA 2013). The drought in the US also opened up opportunities for Argentina and Brazil to export soybean to markets formerly supplied by that country.

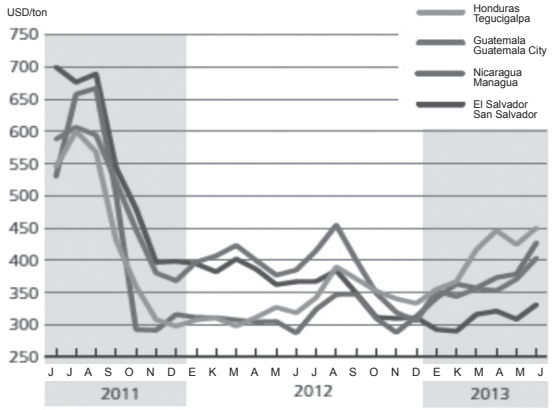
Pests and diseases have had a serious negative effect on the agricultural trade of countries in the Central and Andean regions. The situation will worsen in 2013, because the impact of coffee leaf rust on exports (especially of fine or gourmet coffees) has not yet been quantified; hence, futures contracts for Arabica coffee have fallen by 19% during the last year. Black sigatoka is also affecting banana crops in St. Vincent and the Grenadines, Guyana and Ecuador. In the case of Ecuador, one of the world's leading banana producers, exports for January-September 2012 fell by 6%, with family farmers being forced to abandon their crops due to low prices and a fungal infestation.

Domestic prices of leading crops were in line with international prices but were affected by other factors

Although international commodity prices showed a downward trend during 2012 and the beginning of 2013 (see the chapter on the Context of the Agricultural Sector), the domestic prices of LAC's principal crops were not only affected by the performance of international prices, but also by seasonal factors related to each harvest, imports of each commodity, national price-setting policies for local markets and the application of tariffs and other trade policy instruments. Consequently, domestic prices did not necessarily follow the downward trend of international prices, but rather exhibited different trends.

For example, whereas the domestic prices of the main crops in **Central America** showed great volatility in local markets during 2011, in 2012 and in the first months of 2013 prices were fairly stable, with any variations due mainly to the seasonal nature of harvests. Rice prices also remained stable in the countries concerned, except in Panama where they rose by 6.4% between January and December 2012, and 3.5% from January to April 2013.

Figure 11. Wholesale prices of white maize in Central America.



Source. FAO 2013.

In the case of maize, the main producers in the subregion obtained good harvests at the end of 2012 and domestic prices fell slightly from October to December but then recovered in the first months of 2013 (Figure 11). The performance of beans was also affected mainly by seasonal variations in local harvests, with prices falling in most countries at the beginning of 2013 due to the second harvest (the most important for this crop in the region).

In **Mexico**, prices declined in 2012 and in early 2013 with respect to the levels observed in 2011, also as a result of the good harvests obtained.

In **South America** (Brazil, Uruguay, Peru, Bolivia and Ecuador), the average variations in domestic prices of rice, maize and wheat were greater than those seen in the Central American countries. The price of rice, for example, has risen by more than 1.4% and 2.4% monthly since April 2012 in the cases of Uruguay and Brazil, respectively. As a result of these increases, the price of rice in Brazil between February and April 2013 was 16% higher than during the same period the previous year. Wheat is another product that has experienced rapid increases in domestic prices in South America, particularly in Brazil and Bolivia, where falling domestic production forced these countries to increase their imports from Argentina, at a time when international prices were high.

Preliminary data on maize prices for the two leading producers in LAC (Argentina and Brazil) show a decline, due mainly to good harvests this year, but also in line with international prices, during the first months of 2013.

Although higher imports have pushed prices up in some South American countries, the fact is that the rise in domestic prices of the leading crops has been mitigated by the appreciation of local currencies against the US dollar (as already mentioned in the chapter on the Context of the Agricultural sector) as well as lower import duties and tariffs (on wheat in Brazil), the opening of quotas (for wheat flour in Bolivia) and the release of reserves to local markets (rice in Brazil).

In other countries, the governments have also implemented measures to limit inflation in food prices. For example, Venezuela has fixed prices, Argentina has reached agreements with supermarkets and Brazil has introduced measures that included tax cuts on wheat products and an import quota of two million tonnes from the non-Mercosur zone until July 31, 2012.

Prospects

The forecasts for agricultural production for 2013 are more optimistic

Despite the decline in international commodity prices during 2013, forecasts for grain production (the most important food group in the human diet) suggest record figures at the global level, with high growth rates for coarse

grains and wheat and slightly lower growth rates for rice, compared with 2012 (FAO 2013).

A similar pattern is expected in the Americas, where total grain production in 2013 (with respect to 2012) is projected to increase by 17% in North America (in the US it will grow by 18.3% due to the recovery in the production of coarse grains, and in Canada by 7.4%). In South America, an 11% increase is estimated, driven by maize production (grain production in Argentina will increase by 19%, while in Brazil it will grow by 10.2%). In Central America and the Caribbean, a 2.9% increase is projected (grain production in Honduras will grow by 10.4%, followed by Nicaragua with 7.9%).

In the **Southern Region**, record grain harvests are forecast for 2013. In Brazil, grain yields are expected to set a new record and wheat production is expected to recover. According to the forecasts, the county's agricultural output will grow by just over 13%, though its success appears to be in spite of export infrastructure problems (road systems and ports that are unable to cope with the increase in traffic). The major growth in the grain harvest is due to a 7.9% expansion in the area under cultivation this year (IBGE 2013). In Argentina, sunflower, barley and soybean production are projected to increase during the 2012-2013 farming year (SIIA 2013), while wheat production will fall (due to severe drought followed by too much water), along with maize (a reduction in the area under cultivation, displaced by soybean) and rice. In Uruguay and Paraguay, good soybean harvests are expected in 2013, though the impact of heavy rainfall on maize crops is a cause for concern in the second of the two countries.

In the **subregion of Central America and Mexico**, crop performance will vary. Whereas preliminary agricultural production estimates for Mexico in 2013 suggest a 2.9% rate of growth, following an impressive performance seen in 2012, in Central America the forecasts for 2013 are not optimistic. In Costa Rica, production of two leading crops will be affected: coffee due to leaf rust disease and rice because of changes in rice policies to comply with commitments made at the World Trade Organization (WTO) to reduce domestic price support. In Guatemala, crop production has barely grown due to problems associated with climate and pests. Honduras and Belize both show signs of stagnation while Panama has experienced a contraction in its agricultural production. The positive influence of the incipient economic recovery in the United States, the subregion's main agricultural export market, could be undermined in 2013 by the phytosanitary problems affecting the coffee subsector (see Text Box 4).

n the **Andean Region**, Peru achieved growth of 9.6% during the first quarter of 2013, thanks to increased production of mangoes, potatoes, alfalfa, corn, rice, sugarcane, tomatoes, asparagus and other crops (MINAG 2013). In Colombia, coffee production is expected to rise as a result of the replacement of trees, even though coffee leaf rust affects part of the country's plantations (FNC 2013). In Ecuador, record maize production is anticipated. By contrast, Bolivia's maize production is expected to decline, due to problems caused by drought in the main production areas.

Factors related to global supply and demand will benefit LAC's agricultural production, particularly from 2014 onward

The outlook for LAC's agricultural production appears promising, thanks to the convergence of several factors that create a positive scenario. The factors of demand that will act as a stimulus to farmers are: a) the expected growth in demand for food, particularly proteins, driven mainly by rising incomes and the expansion of the middle class in developing countries. According to some estimates, by 2022 that group could number 853 million households (105% growth compared with the levels seen in

2012), with aspirations for a better quality of life (Dwyer 2013), increasingly urbanized and with more diversified consumption patterns; and b) increased use of agricultural raw materials for non-food uses (especially for biofuels).

Box 4. Coffee leaf rust causes major losses in Central America, mainly affecting small-scale producers.

The Central American region, which accounts for 12% of world coffee production, will suffer losses of up to 2.7 million sacks, worth approximately USD 500 million. More than 50% of the total coffee-growing area of 487,000 hectares has been affected by the disease and production could fall by 20-30% in 2013. El Salvador is the country worst hit, with 74% of the crop affected, followed by Guatemala with 70% and Costa Rica with 64%. Some Caribbean and South American countries have also been hit. The effects of coffee leaf rust are expected to be even greater in the next harvest (2013-2014), and could reach 50%. This will affect consumers of the high-quality coffee produced in the subregion.

This pest will have a major social impact in Central America, since most coffee is grown by small-scale farmers, whose food security is threatened in many parts of the region. In Guatemala alone, 75,000 job losses are projected, while in Honduras the figure could reach 100,000. Both countries have high levels of poverty (ICO 2013).

On the supply side, this positive scenario is complemented by LAC's great potential to expand production, given its rich biodiversity and the availability of uncultivated land that could be used to extend the agricultural frontier that the World Bank estimates at 123 million hectares (Fischer and Shah 2011).[3] Moreover, the region could significantly boost its productivity (especially in the case of family agriculture) and reverse the trend of underinvestment in the sector, through innovation in production technologies, particularly the new biotechnologies, as discussed in the previous report (ECLAC *et al.* 2012) (Text Box 5).

Table 4. Effects of coffee leaf rust in the PROMECAFE countries (2012-2013 harvest)

	Total area (Ha)	Area affected (Ha)	Total work force	Job losses	Total losses Value (millions of USD)	Total losses Volume (60 kg sack)
Costa Rica	94,000	60,000	110,000	14,000	14	73,600
Dominican Republic	131,250	105,000	250,000	105,500	15	142,600
El Salvador	152,187	112,293	95,000	13,444	74.2	322,102
Guatemala	276,000	193,200	500,000	75,000	101	554,394
Honduras	280,000	70,000	1,000,000	100,000	230	1,303,333
Jamaica	3,013	841	12,182	3,640	5.2	3,758
Nicaragua	125,874	46,853	158,000	32,000	60	306,667
Panama	20,097	4,850	42,000	30,000		
Total	1,082,421	593,037	2,167,182	373,584	499.4	2,706,454

Source. ICO, with figures from PROMECAFE (May 13).

With regard to the new biotechnologies, it is noteworthy that in 2013 transgenic crops outnumbered conventional crops in Brazil, with an estimated 37.1 million hectares planted –an increase of 14% over 2012. This represents 54.8% of the total cultivated area in that country, with GM soybean as the star crop (Pappon 2013).

The convergence of these supply and demand factors means that the prices of leading commodities will remain high in the coming decade compared to those seen in the past, despite the projected downturn in the medium term. This will improve farmers' prospects as far as profitability is concerned. In fact, there

3. South America will probably lead the expansion of the agricultural frontier (especially Brazil), followed by the countries of the former USSR (particularly Russia and Ukraine). According to the World Bank, Africa has 202 million hectares available but faces constraints such as institutional problems, high marketing costs, poor infrastructure and longer distances to markets.

are already signs that the number of hectares planted across the globe and in the Americas are responding to the high international prices. However, the amounts harvested will depend on the effects of possible extreme climate conditions.

Growth in the developing world will stimulate agricultural production and trade

The dynamic growth forecast for the developing countries in the coming decade, driven by the BRIC countries (Brazil, Russia, India and China) and others such as Mexico, Indonesia, Thailand and Turkey, will stimulate world agricultural production and trade. In addition, the recovery expected in the more developed economies suggests that global trade in general –and agricultural trade in particular– will once again become an engine of global development. Indeed, some estimates (USDA 2013) suggest that over the next decade there will be a significant growth in imports from China and East and Southeast Asia, and more moderate growth in imports from the US, Japan and the EU.[4]

The upturn in the global demand for commodities from 2014 onward is expected to reinvigorate LAC's agricultural exports and generate major earnings for the region's exporters.

However, agricultural trade will continue to be affected by the weak dollar, the value of which has been falling since 2002. This trend is expected to continue over the next 10 years (USDA 2013), making US exports more competitive but negatively affecting those of LAC countries. This will also create pressure for agricultural commodity prices to remain high, since they are quoted in that currency and there is an inverse relationship between the dollar and commodities.

4. The creation of a US-EU free trade zone, currently under negotiation, will be a determining factor in the expansion of trade. The outcome of the negotiations for other free trade initiatives across the globe will also contribute to this process (see the chapter on the Context of the Agricultural Sector).

The climatic conditions and sustainable use of natural resources will pose major challenges

The increased climate variability evident in the region and forecasts of negative and differentiated impacts of climate change have forced countries to include in their national and international agendas issues related to the use of natural resources and the effects of certain production and consumption patterns

Box 5. New biotechnologies as tools for improving family crop production and addressing climate change.

Biotechnology is unquestionably the crop technology that has been adopted most rapidly in the history of modern agriculture. The area cultivated using this system has expanded significantly: in 2012 it was applied on 170.3 million hectares and by 17.3 million producers, over 90% of whom were small farmers in developing countries (James 2012).

Major progress has been achieved in the genetic improvement of crops, the use of tissue culture techniques to clean planting material and clone elite plants, the use of molecular markers to accelerate selection processes, the incorporation of characteristics of interest through transgenesis (precision genetic engineering) and, more recently, the use of sequencing techniques, genomics and bioinformatics to speed up the identification of genes of agricultural interest (for example, tolerance to drought or salinity).

In addition, advances in biotechnology have led to the generation of more efficient bio-inputs with a wider range of uses. Thus, biotechnology offers the different types of agriculture (conventional, transgenic, organic, agro-ecological) the means to accomplish the objectives of producing larger quantities of better quality food and non-food products to supply the growing demand from a burgeoning population (IICA 2013).

on the quantity and quality of those resources in the future. Governments are expected to make these matters a higher priority.

Growing concern over these issues will result in efforts to:

- Reduce post-harvest losses and waste for food security purposes.
- Address the growing scarcity of potable water and its inefficient use by agriculture.
- Resume investment in irrigation.
- Improve yields to produce more with fewer resources and in a more sustainable way.
- Reduce dependence on fossil fuels.
- Increase investment in research to produce plants resistant to water stress, pests and diseases.
- Develop more profitable biofuels that do not compete with the use of agricultural inputs for food.
- Develop more organic fertilizers.

These and other concerns will be reflected in international agricultural trade, which will gradually come under pressure to introduce standards and policies that take into account the carbon footprint in agriculture and, subsequently, the water footprint or amount of potable water used to produce goods.

Associativity: a mechanism that could help family agriculture meet current and future challenges

Associativity, an option for overcoming the constraints faced by family agriculture in terms of resources and farm size, will become more important in the face of the challenges posed by more open and competitive markets. Contributing to this process will be the results of successful experiences that are worth replicating as a way to improve inclusion and ensure that small-scale agriculture shares in the benefits of trade. Examples include export cooperatives that facilitate the collective purchase of inputs, provide access to support services for agricultural production and strengthen farmers' bargaining power (Text Box 6). Associativity will also be promoted through the activities held in 2014 as part of the United Nations' International Year of Family Farming.

Policy recommendations

Harness the opportunities afforded by the growth in the world demand for food. This is an excellent opportunity for LAC to expand the food supply and its agricultural exports, taking full advantage of the region's relative abundance of natural resources. However, this calls for concerted efforts between governments and the private sector based on a forward-looking and sustainable vision that includes the region's family agriculture.

Support mitigation policies to address climate variability. In order to mitigate the negative impact of climate on the performance of agriculture in the Americas, governments will have to promote policies to reduce emissions and apply more sustainable production and soil use practices. Particular attention should be paid to family farming, the most vulnerable sector, given its dependence on climate-sensitive activities and its limited response capacity. Some recommended practices include incentives to promote zero tillage, reduce deforestation, increase forest cover and fix carbon in the soil, and the promotion of intercropping systems to reduce risks.

Support policies and research aimed at adapting agriculture to climate change. It is essential to strengthen the national science, technology and innovation (ST&I) systems in LAC in order to respond efficiently and proactively to the need to develop new varieties suited to the new climatic conditions. This will call for increased public-private investment, training for human resources, associations between universities and the business sector and the creation of biotech-based businesses, etc.

Promote more actions to develop agriculture that is less dependent on oil. The region should promote greater use of biomass as an energy source through *ad hoc* national strategies, given that oil and input prices (fertilizers and agrochemicals) are projected to increase over the long term and it is necessary to contribute to environmental conservation.

Reintroduce agricultural zoning strategies. The ministries of agriculture should reinstate zoning strategies and define land use plans so as to determine the production capacity of soils and the possibilities of crop rotation based on their quality, in order to prevent degradation and increase yields.

Restructure extension services with an emphasis on family agriculture. Given the new challenges of climate change and increased market competition, governments need to rethink their agricultural extension systems and reinvigorate this neglected public service, with the aim of turning extension workers into agents of innovation, trained in the new subjects and new challenges.

Adopt a preventive approach to agricultural health. In addition to responding to emergencies and outbreaks of pests and diseases, countries must implement preventive actions, which are less costly than corrective actions in terms of income, production and trade losses, and replacement costs, and have less impact on consumer prices.

Box 6. Associativity to gain access to technologies and market niches

Nine organizations comprising 5000 small-scale maize farmers belonging to the Nueva Segovia Regional Network for Technology Innovation (Nicaragua) have successfully negotiated the collective purchase of a package of inputs for growing maize, at preferential prices, with credit and technical assistance included. The representatives of 43 producers' organizations and public and private institutions that make up the local networks of Nueva Segovia, Nueva Guinea and Matagalpa, in northern Nicaragua, are planning activities to enable small-scale maize and bean producers to exchange technological innovations, helping them to improve their incomes and develop marketing consortia (IICA/ Swiss Cooperation 2013).

Three groups of small-scale banana producers in Ecuador (***Corporación San Miguel de Brazil, the Asociación de Bananeros Cerro Azul*** and the ***Unión Regional de Organizaciones Campesinas del Litoral***) created an export consortium that has obtained fair trade certification. Together they represent 2000 small-scale farming families in the provinces of Guayas, El Oro and Azuay, who now have organic, GlobalGAP and fair trade certification and have implemented social, environmental and corporate responsibility practices that also enjoy certified status (Andes 2013).

Promote training of human resources for the integrated agricultural information system (for AHFS). This will enable countries to tackle pests and diseases associated with increased climate variability and climate change, and to incorporate any new regulatory standards governing agrifood trade. In this regard, countries could take advantage of the experience of IICA's virtual schools for safety inspectors (Central America) and plant health inspectors (in the Southern Region, including Colombia).

Continue to modernize AHFS systems. By modernizing AHFS systems, countries can improve their plant health and food safety services, enabling producers to comply with the certification requirements and new health regulations issued by importing countries (for example, those approved by the United States in 2012 and the new laws in the European Union). Otherwise, third parties will intervene in certification processes, which could pose difficulties and create higher costs for LAC's crop exporters.

Make further progress with trade liberalization efforts, but with common standards, either by negotiating new multilateral (WTO), bilateral or plurilateral trade agreements, or under alternative trade initiatives based on exchange or barter systems, but avoiding the proliferation of non-tariff barriers to trade applied as defensive policies.

Promote agricultural insurance, and access to it, as an important risk management tool. With few exceptions, agricultural insurance schemes have not been developed in LAC to the same degree as in the rest of the world, as reflected in low market penetration. Governments should support the creation of effective, sustainable national insurance programs that cover farmers' yields **and** incomes and include indexed insurance products, and that small- and medium-scale producers can afford. This calls for efforts to improve risk assessment and strengthen public-private partnerships among three sectors: the government, farmers and insurance companies.

Promote traditional production practices used in family agriculture in LAC, such as multiple cropping systems, which have proven effective as a risk management strategy, together with zero tillage systems and crop rotation practices, which contribute to the preservation of soil health.

Conclusions

The favorable outlook for the development of LAC's agricultural production and trade is dependent on the recovery of the global economy and on climate conditions not changing significantly. However, the recovery predicted for some developed countries in 2013 now seems unlikely, and will probably not occur until 2014.

Looking to the medium and long terms, the effective and equitable integration of family farming into markets will become necessary to take advantage of growing demand for agricultural products, driven by population growth and rising incomes in developing countries. This will help to maximize FA's contribution to the growth of the supply of agricultural products and improve incomes and, as a result, living standards in the sector. In addition, governments must promote production practices that help preserve the environment and are better adapted to climate change and climate volatility, such as the use of local seed varieties more suited to the agro-ecological conditions, the planting of native crops and intercropping practices.

However, the traditional risks associated with climate have increased and cannot be controlled. In order to mitigate them, it is advisable to promote risk management tools (insurance, futures exchanges, more efficient and transparent markets, etc.) and soil and environment conservation practices (e.g., intercropping, zero tillage and direct planting).

Other risks have also increased, such as those associated with markets (due to price volatility). This will call for improvements in the supply of information for effective decision-making.

There are also risks of human (i.e., institutional) origin that are controllable, such as those stemming from budget cuts in agricultural services, the application of non-tariff barriers

to trade and the adoption of policies that distort trade and prices. The latter are increasing due to the recent crises and creating greater uncertainty in policies and institutions. In response to these risks, governments must work to ensure that their standards, policies and institutions are stable and reliable.

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Chapter 2.2: Livestock

Livestock

Growth of the Latin American livestock industry is a welcome economic boon to the region, and potentially to smallholders, but will bring with it complex, potentially detrimental and unintended consequences whose costs will need to be carefully considered against the benefits of that growth.

LAC meat production and consumption will continue to grow rapidly over the next decade but at a lower annual rate. Key drivers include South America's comparative advantage in extensive cattle production, expected relative growth in per capita incomes, a shift in consumer preferences from beef to other proteins, and pro-production vs. pro-environmental policies. Growth of the livestock industry can help to alleviate poverty across the region but investments in infrastructure, more training activities and the delivery of new technology are needed so that everyone can share in the benefits.

Facts

- LAC meat and milk production has grown rapidly over the last decade with poultry production leading the way.
- Widespread adoption of new production technologies and practices in LAC countries, including improved breeds, has fostered robust gains in meat and milk output per head across all livestock species over the last decade.
- Growth of the LAC livestock industry has been accompanied by increasing outbreaks of animal diseases, including foot and mouth disease, avian influenza and now bovine spongiform encephalopathy (BSE) or mad cow disease.
- Some change in livestock systems in LAC countries towards more intensive mixed crop/livestock systems and dairy production is occurring with investments in transportation infrastructure and the conversion of pastureland into cropland.
- LAC per capita meat and milk consumption have increased rapidly but LAC consumers are eating less beef, sheep meat and even pork in some cases, preferring poultry as a source of calories and protein.

Trends

Meat and milk production continue to grow strongly in LAC

Livestock farming makes a big contribution to the economic well-being of poor families in rural areas of developing countries like many of those in Latin America and the Caribbean. Consequently, a critical measure of the growth and development of rural communities and the advancement of the economic well-being of rural families in developing countries is the trend in their production and consumption of livestock products. On that score, LAC as a region continues to post impressive gains. LAC meat and milk production has grown rapidly over the last decade with poultry production leading the way (Table 5). LAC poultry production has nearly doubled over the last decade (2001-2011), far outpacing poultry production increases in the U.S. and the rest of the world. Though growing less strongly, LAC beef, pork and milk production nonetheless have surged by more than a third over the same period, still well ahead of the United States and the world average. Furthermore, the LAC region now accounts for a larger percentage of world beef, sheep meat and poultry meat production than the U.S. and almost the same share of world milk production (Table 5).

Table 5. Meat and milk production in LAC, the U.S. and the world in 2012, percentage change from 2000 to 2012 and share of world production

	Production 2012			Percent Change (2000-12)			Share of World Production	
	LAC	U.S.	World	LAC	U.S.	World	LAC	U.S.
	million tonnes			Percentage			Percentage	
Beef	18.6	11.0	66.1	33.8	-6.2	11.8	28.2	16.7
Pork	6.9	10.3	111.7	37.5	22.3	24.1	6.2	9.2
Sheep meat	0.4	0.1	13.5	1.4	-34.8	18.9	2.7	0.5
Poultry	23.8	19.3	104.2	91.3	17.8	50.1	22.8	18.5
Milk	84.8	89.8	737.4	37.0	18.2	28.1	11.5	12.2

Source. OECD-FAO (2012).

Widespread adoption of new production technologies and practices in LAC countries, including improved breeds, has fostered robust gains in meat and milk output per head across all livestock species over the last decade (FAO 2013b). As a result, LAC productivity in pork and poultry meat is now approaching U.S. levels and is substantially above the world average for both types of meat. LAC milk productivity (1.55 tonnes/head), however, continues to lag considerably behind that of the U.S. (9.31 tonnes/head) but is above the world average (1.10 tonnes/head). Nevertheless, LAC milk productivity is slowly closing the gap with the U.S., increasing by more than 22% over the last decade compared to only about 16% in the U.S.

Only a limited number of LAC countries have the production capacity required to generate livestock inventories and meat production

Livestock inventories are unevenly distributed among LAC countries. The top three countries in LAC account for a large share of the inventories in each category, including about 70% of the beef cattle and pigs, 64% of the dairy cattle, 60% of the poultry and almost half of the sheep. Brazil continues to be the leading producer of all major livestock species with over half of all inventories of beef and dairy cattle and pigs, about 40% of poultry inventories and 20% of sheep inventories Brazil lags behind many other LAC countries in meat productivity. Nevertheless, Brazil's meat and milk production efficiency rates have been growing faster than those of the countries with the highest yields. With large

and growing livestock inventories, the growth in production efficiency will ensure that Brazil continues to dominate LAC livestock, meat and milk production.

Beef production in Mexico, LAC's second largest beef producer, remained steady at about 1.8 million tonnes in 2011 and 2012, and will not likely increase in 2013 as the cattle industry struggles with the effects of a continuing drought and high feed prices (Hernandez *et al.*, 2013). New breeding lines, better farm management techniques and increased slaughter weights are expected to arrest the slow decline in Mexico's pork productivity since 2000.

Chile's poultry production rose by 50% between 2000 and 2011 due to an increase in both inventories and yield. Three companies in Chile account for 92% of its poultry meat production and are accused of colluding to restrict production to keep poultry prices high (Hennicke 2012).

Both production and outbreaks of livestock diseases have increased

Foot and mouth disease (FMD) has been endemic in many areas of South America for more than one hundred years. FMD outbreaks in Paraguay in 2011 and 2012 cost their livestock industry millions of dollars in lost animals and beef exports (UPI 2012).

Uruguay has not reported an outbreak of FMD since instituting its innovative livestock traceability system following the outbreaks in 2000 and 2001 (ProMED-mail, 2013). Brazil has a history of struggles with FMD but has not reported a breakout since 2007, largely due to an aggressive vaccination campaign (Rich and Narrod 2010).

Other diseases continue to cause problems in LAC

The first case of bovine spongiform encephalopathy (BSE) (commonly known as mad cow disease) was reported in Brazil in 2012, in the state of Paraná, due to the lack of a surveillance program (ProMED-mail 2013). That same year Brazil also dealt with the second worst outbreak of bovine rabies in that country since the 1980s (ProMED-mail 2013). Many Brazilian producers only vaccinate their cattle for rabies after an outbreak occurs, which is too late even though the cost of the vaccine per animal is miniscule compared to the cost of the loss of an animal (Suinocultura Industrial 2012). Outbreaks of brucellosis occurred in Brazil in 2012 and in Chile in 2013. Anthrax has become endemic in Argentina with multiple outbreaks of the disease every year over the last 25 years. Human negligence in not vaccinating livestock is the main cause.

Avian and swine influenza continue to take a toll

Another outbreak of avian influenza is impacting egg production in Mexico, this time in the State of Guanajuato (Hernandez and Branson 2013). The virus is similar to those involved in the 2012 and 2013 outbreaks in Jalisco and Aguascalientes. The most recent outbreaks resulted in around 3.9 million birds being culled, including almost 2.2 million broilers, nearly 1 million layers and some 800,000 breeders (Hernandez 2013). Continuing outbreaks could have a long-term effect on consumer confidence in the Mexican poultry industry. Classical swine fever

(CSF) has proved to be highly persistent, with recent outbreaks in Ecuador and Guatemala (ProMED-mail 2013). Trichinellosis outbreaks have been widespread in recent years across LAC countries, from Mexico to Chile and Argentina (ProMED-mail 2013).

The growth of livestock production in LAC poses environmental challenges

In LAC, rising livestock production has gone hand in hand with greater environmental challenges, particularly as far as deforestation rates are concerned. Some change in livestock systems in LAC countries towards more intensive mixed crop/livestock systems and dairy production is occurring, with investments in transportation infrastructure and the conversion of pastureland into cropland (Wassenaar *et al.* 2007). The observed shift towards the production of poultry and pigs and away from cattle could lead to a reduction in deforestation rates. However, the rapid growth of non-ruminant production is creating growing pressure not only to convert deforested pastureland to crops but also to clear forestland, specifically for crops like soybean for the production of livestock feed (Herrero *et al.* 2009). The social costs of deforestation in LAC, and the consequences in terms of soil degradation and erosion, water pollution, loss of biodiversity and loss of carbon contributing to global warming, are potentially enormous (FAO 2013c).

Livestock products provide a large and increasing share of the daily nutritional needs of LAC consumers

The daily per capita caloric intake provided by livestock is one indication of the state of the diet, and of the need to improve nutrition, in developing countries. In LAC countries, livestock products provide substantially more of the daily caloric intake (622 kcal/capita/day) compared to the aggregate of developing countries (178 kcal/capita/day) and the world (501 kcal/capita/day) (FAO 2013b). Although 40% below the United States, the daily calories provided by livestock products have increased by 10% in the LAC over the last decade while declining by 2% in the United States.

Table 6. Per capita consumption of meat and dairy products, 2012 and percentage change 2000-12, selected LAC countries

	Beef		Pork		Chicken		Sheep meat		Dairy[a]	
	kg/hd	Percentage change	kg/hd	Percentage change	kg/hd	Percentage change	kg/hd	Percentage change	kg/hd	Percentage change
Uruguay	55.9	2.1	10.1	28.9	23.2	52.4	1.9	-79.6	156.9	-42.9
Argentina	38.6	-14.5	6.3	4.3	33.8	47.8	1.0	-29.8	46.0	4.9
Brazil	30.5	23.4	10.8	-0.6	42.5	63.5	0.4	-15.9	75.7	15.5
Chile	16.0	3.4	17.6	40.7	28.9	22.5	0.4	-38.9	55.0	-28.8
Mexico	10.6	5.3	11.0	20.7	26.7	47.5	0.7	-4.2	46.2	28.9
Other LAC	8.7	10.1	6.1	51.3	17.2	33.3	0.4	-9.2	63.3	61.6
LAC	18.8	7.7	8.9	16.0	30.7	51.6	0.6	-18.8	76.5	21.6
U.S.	25.2	-18.7	21.4	-8.5	44.2	2.6	0.4	-22.0	81.3	-9.5
World	6.5	-3.3	12.3	7.6	13.0	30.9	1.7	4.3	65.2	11.6

Source. OECD-FAO (2012).
[a] Fresh dairy products as defined by OECD-FAO (2012).

Milk accounts for the largest proportion of daily caloric intake in LAC

Per capita poultry and dairy product consumption have grown rapidly in many LAC countries. Milk is the animal product that makes the biggest contribution to the daily caloric intake of LAC consumers (185 kcal/capita/day), which is about three times the level of developing countries but only about half the level of the United States (FAO 2013b). Most of the growth has occurred in Mexico, Brazil and in other, smaller countries (Table 6). Brazil's annual per capita consumption of fresh dairy products in 2011 (74.9 kg) was only slightly less than that of the U.S. (82.3 kg) but is expected to exceed the U.S. in 2017 (OECD-FAO, 2012). Other leading per capita fresh dairy product consumers include Chile, whose consumption dropped by 24% between 2000 and 2011, and Mexico, whose consumption jumped by over 26% during the same period. The rest of LAC countries experienced a 58% growth in per capita milk consumption over the same period.

Per capita consumption of poultry is growing rapidly, more strongly than consumption of beef

LAC per capita poultry consumption increased by over 50% between 2000 and 2012 and is now contributes the second largest amount of calories from animal products to the diet of LAC consumers (Table 6). Likewise, per capita milk consumption grew by about 50% over the same period in Brazil (63.5%), Uruguay (52.4%), Argentina (47.8%) and Mexico (47.5%) (Table 6). Average LAC per capita egg consumption jumped nearly 17% between 2000 and 2009 (FAO, 2013b). Mexico and the Caribbean countries recorded the highest annual per capita egg consumption in the LAC in 2009 (18.1 kg and 15.6 kg, respectively), even higher than the 14.1 kg consumed annually per person in the United States.

LAC per capita beef consumption has continued to increase, albeit more slowly than the consumption of pork, poultry meat and dairy products (Table 6). LAC consumers continue to eat less and less beef, sheep meat and even pork in some cases, preferring poultry as a source of calories and protein. This trend is perhaps most marked in Argentina, where per capita beef and sheep meat consumption have declined substantially since 2000 (-14.5% and -29.8%, respectively), while per capita chicken consumption has increased by 50%. Even LAC countries in which per capita beef consumption has increased have seen a more rapid rate of growth in per capita chicken consumption, resulting in a relative decline in per capita beef consumption. In LAC countries and the rest of the world, chicken has become the meat of choice due to its lower cost.

LAC exports are increasingly dependent on the beef, pork and poultry sectors

Exports of LAC beef have more than doubled while exports of both pork and poultry have more than quadrupled since 2000 (OECD-FAO (2012)), despite growth in the consumption of all major animal products except sheep meat. Consequently, the LAC meat industry has become more dependent on exports, as indicated by the marked increase in exports as a share of LAC production since 2000 (OECD-FAO 2012).

Argentina's beef exports are a major exception, as its beef industry continues to struggle to recover from a severe drought in 2008 that led to large sell-offs of cattle and subsequent shortages of beef in the domestic market. Argentina's government continues to restrict

beef exports to stabilize prices and ensure adequate domestic supplies (Joseph 2012). The continuing devaluation of the Argentine peso has also dampened the competitiveness of Argentina's beef exports. Consequently, Argentine beef exports have fallen by nearly 16% since the drought-induced high in 2009.

The difficulties faced by Argentina's beef industry have been a major factor in the doubling of chicken production in that country since 2000, leading to a huge increase in poultry exports, from virtually nothing a decade ago to 250,000 tonnes in 2011. Argentina has managed to become the world's fifth largest exporter of chicken (mainly chicken breasts and legs) and, according to some analysts, is on track to overtake China and become the world's fourth largest poultry exporter behind Thailand, Brazil and the United States (Brooks 2012).

Brazil dominates LAC poultry exports

Brazil continues to be the leading poultry exporter in LAC, accounting for nearly 89% of all LAC poultry exports, with the figure expected to reach nearly 92% by 2021 (OECD-FAO, 2012). Brazil also accounts for the largest share of LAC pork and beef exports (71.6% and 51.7%, respectively). Chile's share of LAC pork exports has been growing, accounting for 16.5% in 2011 compared to only 10% in 2000.

Net imports of dairy products are on the decline in LAC

LAC countries have been primarily net importers of dairy products, accounting for nearly 10% of global whole and skimmed milk powder imports in 2011 (FAO 2013b). Rapid growth in LAC per capita incomes increased demand for dairy products and imports. Growth in domestic dairy production and exports, however, has reduced net imports of all dairy products substantially over the last decade. Mexico, the region's largest importer of both fluid and non-fat dry milk, has experienced an erratic but generally downward decline in net imports over the last decade (FAO 2013b). Brazil's dairy production and the strength of its exports have reduced the country's imports, with the former even overtaking the latter for several years.

Prospects

LAC livestock and meat production will continue to grow, but at a slower pace

LAC meat production is expected to continue its rapid growth over the next decade, although at a somewhat lower annual rate. In the process, LAC's share of global livestock inventories, meat supplies and world meat exports will likely continue to expand along with per capita meat consumption. Key factors in the expected performance of the LAC meat industry include the growing comparative advantage of South American countries in extensive cattle production, expected relative growth in per capita incomes, a shift in consumer preferences from beef to chicken and pork, and policies designed to encourage production while minimizing the environmental impact.

Southern Cone countries will continue to lead the way in beef and pork production

Forecasts suggest that Brazil's production will increase by almost 11% over the next decade, compared to 55% over the last decade. Despite the slower increase in production, a sudden

16% rise in beef exports is expected, combined with a 3% rise in per capita consumption (Table 7). Government subsidized investments in genetics, pasture, machinery and cold storage capacity, improved genetics, and other government programs, will foster the growth in production. A strong expected recovery in Argentine cattle inventories and beef production from the worst drought in 50 years is expected to lead to a 7% increase in per capita consumption and an 85% increase in beef exports over the next decade (Table 7).

In 2010, Uruguay replaced Argentina as LAC's second largest beef exporter (after Brazil). Argentina is expected to overtake Uruguay in beef exports by 2014 despite the continued beef export push expected by Uruguay over the next decade. Brazil's 48.5% share of LAC pork production is expected to slip slightly to 46% over the next decade, despite expected growth of 12.5% over that period (Table 7). Argentina and Chile are expected to continue to expand their pork production, with increases of 31% and 26.5%, respectively, over the next decade.

Table 7. Projected percentage growth in meat and dairy product production, per capita consumption and exports in LAC, selected LAC countries, the U.S., and the World, 2012-2021

	Uruguay	Argentina	Brazil	Chile	Mexico	Other LAC	Total LAC	U.S.	World
	Percentage of change								
Beef									
Production	19.8	23	10.5	28.4	11.2	23.5	14.9	11.6	15.7
Consumption/capita	6.5	7.2	2.6	8.7	8.1	9.9	4.1	6.6	5.7
Exports	27.0	85.3	16.2	-0.8	-4.5	7.7	22.0	17.7	17.4
Pork									
Production	14.2	30.6	12.5	26.5	14.0	22.6	17.3	9.8	13.0
Consumption/capita	19.4	14.7	6.4	7.1	4.8	13.2	7.8	3.2	3.1
Exports	0.0	180.7	7.9	53.9	9.6	-10.2	17.8	8.9	9.2
Sheep meat									
Production	-2.9	-11.6	6.2	7.0	25.5	13.4	19.3	-6.0	17.7
Consumption/capita	126.2	-19.2	0.0	13.6	4.4	9.0	12.5	-7.7	7.1
Exports	-90.4	-6.6	-86.7	-10.2	0.0	16.7	-30.5	1.2	19.7
Chicken									
Production	17.5	22.0	19.9	26.8	30.7	25.6	23.9	16.6	22.1
Consumption/capita	10.9	13.1	11.4	17.7	11.1	13.3	12.3	8.0	11.5
Exports	33.3	32.6	22.2	5.6	19.0	-9.9	22.0	18.1	15.7
Dairy Products[a]									
Production	15.3	10.9	16.0	22.4	23.6	29.9	21.5	0.9	22.2
Consumption/capita	11.4	3.3	8.7	14.3	13.0	17.5	11.2	-6.2	22.2

Source. Calculated from data in OECD-FAO (2012).
[a] Fresh dairy products as defined by OECD-FAO (2012).

Peru's poultry industry set for strong growth

Brazil's poultry production doubled over the last decade but is expected to grow by only about 20% over the next decade, matched by similar growth in consumption and exports of 19% and 22%, respectively (Table 7). Brazil's share of LAC production is also expected to decline slightly over the next decade. Argentina is expected to remain easily the second largest LAC poultry producing country (Table 7). Chilean consumers will continue to prefer chicken over the next decade, with per capita consumption expected to rise by 18% (Table 7).

After doubling over the last decade, Peru's poultry production is expected to expand by a further 40% over the next one. As a result, Peru will overtake both Chile and Argentina to become LAC's second largest per capita consumer of poultry by 2016 (Table 7).

LAC dairy production to continue to grow

LAC milk production is expected to grow by 21.2% over the next decade, compared with the 25% increase achieved over the previous one. Higher energy and feed prices will continue to maintain the comparative advantage of the pasture-based milk production system of Latin America over the systems of developed countries based on the use of feed grains, further reducing the region's net imports of dairy products. While the milk production of most Latin American countries is expected to experience substantially lower growth over the next decade, Argentina's production of liquid milk and fresh dairy products is expected to pick up steam, driven by improved management and production efficiency (Table 7).

Equally strong growth in Argentina's consumption of dairy products is expected to reduce exports of those products by nearly 9% over the next decade. Brazil's milk and dairy product production is expected to grow markedly over the next decade, driven by both increased herd size and improved productivity. Although Brazilian dairy production could possibly outpace consumption over the coming years, Brazil faces dairy supply chain and quality issues that must be resolved to realize its export potential in this area.

Mexico's dairy industry contracts, while Uruguay's expands

After several years of strong growth in Mexico, milk production leveled off between 2009 and 2011 and is expected to achieve no more than a 5% increase over the next decade (OECD-FAO 2011). The low value of milk relative to beef in Mexico is leading dairy producers to cull their herds (Berman 2013). Small and medium-sized Mexican dairy producers continue to quit the industry, which is struggling with rapidly rising input costs and growing water scarcity. In contrast, widespread adoption of measures to increase milk productivity in Uruguay, including feed supplements, improved pastures, investments in irrigation and other technologies, is expected to turn erratic dairy production patterns into positive average annual growth rates of 2% and 1.5%, respectively, over the next decade (Table 7).

The role that livestock farming should play in improving the well-being of rural families in LAC

The rapid growth in livestock and meat production in LAC countries will very likely

improve the lives of many of the region's rural poor in the future. For many rural LAC families, livestock production provides a supply of food, a source of income, draught power for food production, manure for use as fertilizer or fuel, and a means to increase wealth and status during good years and create reserves for lean years. However, the extent to which the explosive growth in livestock production will help to alleviate poverty and strengthen smallholder and family farming in the region depends on multiple factors.

Many smallholders not expected to benefit from growth of LAC livestock industry

Many smallholders who depend on livestock farming for their livelihood are not integrated into commercial markets. In general, they rely on family labor for essential livestock production activities like herding (FAO 2013a). Consequently, the rapid adoption of new livestock production technologies, the development of more efficient production systems, the growth of market demand, and related changes that are transforming the livestock industries in many LAC countries are having little effect on the lives of many small-scale livestock producers in the region.

Poor farmers are more likely to raise small stock like poultry, pigs, sheep and goats rather than cattle for various reasons, including the lower capital investment required and their higher efficiency in meat production (Otte *et al.* 2005). However, the production of poultry and pigs is particularly well suited to large-scale, vertically integrated operations. Not surprisingly, much of the growth in both poultry and pigs in LAC countries over the last decade is the result of efficiencies gained from increased scale of production and vertical integration, from which only a handful of enterprises have benefited, as demonstrated by the case of poultry production in Chile.

Small investments can harness the livestock industry's growth potential and alleviate poverty

For the many rural households who participate in commercial markets at some level, the growth of livestock farming will provide an opportunity to earn cash to supplement subsistence needs and pay for production inputs (Otte *et al.* 2005). The closer these households are located to major urban areas in the region, the more opportunities will exist to benefit from the ongoing growth in the demand for livestock products. In these areas, small households may benefit directly through contract production or by supplementing the supplies of urban food wholesalers and retailers. In more remote areas, small investments in infrastructure, more training activities and the delivery of new technology such as improved genetic material, more efficient production management systems, animal health services and other modern inputs, would generate large social returns by enabling small livestock producers to participate in some of the benefits of the rapidly growing markets for livestock products in their countries.

Meat prices expected to soften in the short run before rising sharply

A U.S. drought-induced surge in the global cost of feed grains is reducing the profitability of livestock production around the world. Therefore, producers in many LAC countries are sending their animals, including breeding stock,

to slaughter. The short-term implications are an increase in meat supplies and lower prices, but an eventual decline in livestock inventories and meat production and higher prices over the next few years. South American countries are expected to fare somewhat better than many other parts of the world because most of the region's feed grains are domestically produced. Elsewhere in LAC –e.g., Mexico, which also has experienced severe drought in livestock production regions– the cost of feed will continue to rise and push meat prices upwards.

Is globalization a threat to small-scale livestock producers in LAC, or will they benefit from it?

The growth in trade in meat and milk products in LAC and rising feed prices are clear manifestations of the pressure of globalization on LAC livestock markets and the potential benefits and threats to small livestock producers in the region. The potential benefits will include greater foreign market opportunities for livestock producers and rapidly expanding access to cheaper and more efficient inputs (*Otte et al.* 2005). Globalization will also bring pressure to modernize, invest in new technologies, adopt more efficient management systems, and form alliances throughout the supply chain or face extinction due to growing global competition. Small producers will see such changes as threats because their relevance to national supply chains can dissipate over time as large and multinational firms take control of markets if, as is often the case, they lack the capital and knowledge to upgrade their participation in markets. One important benefit from globalization for small livestock producers will likely be growing off-farm employment opportunities, particularly for those producers willing to migrate to other parts of their region or country, or even abroad (*Otte et al.* 2005).

Additional pressure on the environment in LAC from poultry, pork and milk production, and to a lesser degree from the beef industry

Latin America's comparative advantage in livestock production due to its potential for incorporating new pastureland is expected to continue to exert pressure for forests to be felled for livestock production. The expected reduction in the rate of growth of cattle and beef production, in Brazil in particular and in LAC in general, will help slow the expansion of pastureland in the Amazon and other forested areas in the region. However, the expected faster growth of poultry, pork and milk production, as per capita incomes increase and consumer demand for protein shifts away from beef, is likely to create more pressure to clear forested areas to grow feed crops. Wassenaar *et al.* (2007) predict the demand for pork and poultry in LAC countries will increase faster than that of beef, leading to an increase in the rate of forest loss over the years.

South America - a hotspot for outbreaks of animal diseases

The trend toward more intensive production systems in South America, primarily for the production of pork, poultry and milk, will continue to turn the region into one of the 'hottest hotspots' in the world for animal health risks (Perry *et al.* 2011). The growth and intensification of non-ruminant production systems will create growing demand for veterinary pharmaceuticals and animal health services. The danger over the coming decade is that animal health needs will far outpace the ability of current animal health systems to deliver needed services and drugs, as well as the development of the regulations and standards required to ensure good practices in fighting the spread of animal diseases.

Policy recommendations

The growth of the LAC livestock sector has been an economic boon to the region, creating employment, generating economic growth, mitigating nutritional deficiencies and promoting food security. Relieving the constraints to livestock sector development must be a key component of economic development programs and policies in Latin America. The expected growth of the LAC livestock industry, however, will pose continuing risks to small livestock producers, the already fragile environment and efforts to contain animal diseases. Aggressive measures will be needed to minimize those risks while allowing the benefits of the growth of the region's livestock industry to be realized.

Measures to minimize the risk to smallholders and alleviate poverty still further

Although the growth of the livestock industry has the potential to help alleviate poverty across the LAC region, appropriate incentives and careful planning are needed to ensure that poor livestock producers are not left behind and become more dependent on subsistence systems than before.

A wide array of policies, mechanisms and systems that focus on livestock production to alleviate poverty in Latin America and other developing regions have been proposed by numerous authors (see, for example, Pica-Ciamarra *et al.* 2007 and Otte *et al.* 2012). These proposals call for the removal of a wide range of barriers that limit livestock farming's contribution to food security and poverty reduction, including lack of access to technology, credit, resources, markets, information, training, etc. Clearly, poor LAC livestock producers would greatly benefit from policies and technologies designed to enhance production efficiency and profitability.

To ensure that poor LAC livestock more fully participate in the benefits flowing from the rapid growth in the region's livestock industry, policies and programs will be needed to integrate small producers into the livestock supply chain in the region to allow them to move from subsistence to more mixed, diversified production systems.

Livestock production policies to alleviate poverty can be classified into three groups:

a) Policies to enhance access to production inputs (land, water, risk management tools, etc.);

b) Policies to promote smallholder production and more efficient production, including measures to enhance access to credit, improved veterinary services to eradicate diseases that can create economic hardship, and extension services to provide the necessary training and technical assistance in livestock breeding, production, marketing, management and new technology adoption; and,

c) Policies to encourage enhanced production quality and competitiveness through publicly funded research and assistance to ensure that small farmers can meet national, regional and international food safety and quality standards (based on Pica-Ciamarra *et al.* 2007).

Of course, even if effective production policies are implemented and adopted by small farmers, relatively few benefits of the rapid expansion of the livestock industry in LAC are likely to reach them unless associated policies are developed and implemented to strengthen the market linkages between rural communities and buyers in urban centers and international markets. Key needs include public investments in infrastructure and reliable transport and marketing systems between rural areas and commercial markets.

Another key need is access by smallholders to critical information for decision-making. Public investments in communication and information systems that serve rural communities would be of great assistance for decision-making and reduce the risk associated with smallholder integration into supply chains. Other needs include policies to reduce the cost to smallholders of integrating into livestock supply chains, such as measures to assist them in contract negotiation, antitrust laws to allow competition in pricing and procurement, and legal assistance in resolving contract disputes (Pica-Ciamarra *et al.* 2007). The establishment of associations of small farmers could also be an effective means of integrating smallholders into commercial markets and supply chains.

Pro-production vs. pro-environment policies

Policies implemented to promote the development of the LAC livestock industry can undermine pro-environment measures, and vice versa. The critical policy question is whether the benefits of a growing Latin American livestock industry in terms of its contribution to economic development and prosperity in the region outweigh the environmental costs.

Steinfeld *et al.* (2006) provide a comprehensive list of technical measures that could be implemented to mitigate livestock's threat to the LAC environment. To deal with the extensive land degradation of the past and potential degradation in the future, they recommend measures such as soil conservation programs, silvopastoral systems and better management of grazing systems. They also recommend sustainable intensification of crop and livestock production to reduce deforestation and pastureland degradation and the resulting carbon dioxide emissions. To enhance water quality in the region, they suggest better management of livestock waste in intensive systems. Improving protection of wild areas and integrating livestock production systems into landscape management efforts, they suggest, is critical for dealing with the loss of biodiversity that accompanies deforestation aimed at the expansion of crop and livestock production.

Steinfeld and Gerber (2010) suggest that meeting LAC's growing demand for meat does not have to lead to further deforestation, because the additional meat required can easily be produced through greater intensification of production, particularly given the low-intensity levels of production in much of Latin America. While such an approach may be technically feasible, greater intensification of cattle production, at least, is not currently an economically feasible option for much of Latin America.

However technically viable a proposed measure may be for reducing the environmental footprint of the LAC livestock industry, effective implementation of such measures will occur only if they are also economically feasible. Public policies that incentivize changes in behavior by livestock producers (or penalize the failure to adopt such changes) are perhaps the best hope for stemming the overwhelmingly negative effects on the LAC environment of the profit-driven growth of the livestock industry.

A study in Mexico found that conversion of forestland to pasture in heavily forested areas is driven predominantly by price incentives (see FAO 2006). Designing effective price policies and pricing mechanisms could be the most effective means of encouraging environmentally appropriate behavior in heavily forested areas in an economically feasible way. The same study also found that in

areas of Mexico with medium deforestation, poverty drives the continued conversion of forests for livestock production. Smallholders often expand into marginal forestland to make up for the declining fertility and productivity of their existing land. In such areas, ecosystem services payments and policies designed specifically to alleviate poverty could be economically effective in reducing the rate of deforestation.

Eco-certification of farms is a measure that is growing in popularity. The idea is that animal products from eco-certified farms would command higher market prices and, therefore, incentivize sustainable production behavior. How effective the measure will be at changing producer behavior will depend on the willingness of consumeers to pay a premium for eco-certified beef. In March 2013, the Brazilian Association of Supermarkets, representing 2800 Brazilian supermarkets, signed an agreement banning beef from cattle raised in deforested areas of the Amazon from their shelves (mongabay.com 2013). Under the agreement, the supermarkets are required to reject meat of unknown origin, lending support to Brazil's certification system for cattle production. The system is intended to improve transparency in commodity sourcing while encouraging landowners to respect Brazil's environmental laws.

Measures to minimize outbreaks of animal diseases

Controlling the outbreaks of livestock diseases that are likely to result from the sustained growth of the LAC livestock industry and the continued intensification of non-ruminant production is an obvious priority, not only to facilitate further growth but also to protect against any implications for human health. Traceability systems have received increasing attention in LAC countries as an effective method of detecting possible outbreaks of diseases and facilitating a rapid response to prevent diseases from spreading. Uruguay's comprehensive traceability system, instituted following outbreaks of FMD in 2000 and 2001, has become a model for other LAC countries of how such a system can be an effective tool not only to combat animal diseases but also to enhance credibility in world markets while adding market value to livestock products (IICA 2013).

By one estimate, the return on investment in the Uruguay traceability system has been USD 20 for every dollar invested in the system (IICA 2013). Although the social and economic incentives for mitigating livestock diseases are clear, the difficulty is the often prohibitive cost of the controls and eradication measures needed. Meaningful change is needed in the difficult and often politically charged process of deciding how to distribute the limited budgets available for national animal health delivery across the plethora of diseases of concern.

Conclusions

The recent and likely continued growth of the LAC livestock industry over the next decade is an economic boon to much of Latin America. The growing industry is generating employment and income opportunities that are multiplying throughout a lengthy supply chain, from producers to processors, transporters, wholesalers, retailers, exporters and related input supply industries. At the same time, the industry is making a big contribution to improved food and nutrition security and poverty alleviation across the region. While Brazil will continue to dominate all branches

of the industry, it will need to invest heavily in advancements in meat and milk productivity in order to continue increasing its regional and global competitiveness.

Growth of the LAC livestock industry, however, will bring with it complex, unwanted and potentially detrimental consequences whose costs will need to be weighed carefully against the benefits that growth can bring to the region. Without appropriate policies, mechanisms and systems designed to make livestock production a means of alleviating poverty, the economic benefits of the growth of the LAC livestock industry could end up in the coffers of a handful of large livestock enterprises, leaving poor livestock producers even more isolated and more dependent on subsistence systems than before. In particular, policies and programs will be needed to integrate small producers into the livestock supply chain in the region, to enable them to move more easily from subsistence to mixed, diversified production systems.

Continued and growing environmental degradation is another downside with potentially global consequences. Significant incentives are needed to ensure that the environment is protected as the industry grows, while still allowing producers and others throughout the supply chain to benefit. A wide range of technically feasible solutions to the environmental impacts of the growing LAC livestock industry has been proposed. Effective implementation of such measures will occur, however, only if they are also economically feasible. The environmental consequences can best be addressed through effective collaboration between researchers, policy makers and livestock producers and others along the livestock supply chain.

Disease-related issues will also continue to plague the industry and are likely to escalate as the industry grows and non-ruminant and milk production becomes more intensive. Effective control of outbreaks of livestock diseases is a priority, both to facilitate the industry's growth and to guard against the implications for human health.

Traceability systems, following the innovative model of Uruguay, can be an effective tool in that process. While the public sector must develop and enforce disease control measures and develop effective animal health delivery systems, successful control and prevention of animal disease outbreaks will require the cooperation of producers, researchers, extension workers, veterinary service and drug providers, and others to develop and implement effective animal health management systems and related services.

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Chapter 2.3: Fisheries and Aquaculture

Fisheries and Aquaculture

How to meet the world's growing demand for fish in a safe and sustainable manner has become a major challenge for governments. Global pressure for a larger supply of animal protein means that more than 60% of the world's fisheries are fully exploited and 30% are overexploited. Aquaculture is the main alternative for making up the shortfall but first we must decide how much fish we want to harvest from our oceans, rivers and lakes, and how much we want to produce through fish farming.

Facts

- Fishing and aquaculture continue to be the world's fastest-growing food production activities, contributing 150 million tonnes annually. Aquaculture production has grown steadily and the proportion of fish produced on farms is currently higher than from wild fisheries. Even so, the World Bank has called for a reduction in fishing levels due to high levels of overfishing, and the United Nations Food and Agriculture Organization (FAO) has recommended increasing aquaculture production in a sustainable way.

- Global demand for fish is growing rapidly due to higher per capita consumption in developing countries. Currently, the average consumption of fish in the world has increased to 19 kg, but this amount varies by region. While people in China and Spain consume 31.9 kg and 27.6 kg, respectively, each year, in South America consumption is only 9 kg.

- In Latin America and the Caribbean (LAC), the economic and social importance of fisheries and aquaculture is high. The two sectors combined provide direct employment for more than two million people. Artisanal fishing sustains the economies of many rural communities where, in some cases, the contribution of fish to animal protein intake exceeds 80%. The number of people working in fisheries and aquaculture as a percentage of employment in the entire agrifood sector is expected to continue to rise, driven by the growth of the aquaculture sector.

- Commercial sea fishing continues to be the main source of fish at the regional level, accounting for 87% of total production, which corresponds to approximately 16.4 million tonnes, most of which is used to produce fishmeal. Most fishmeal and fish oil is used to feed fish in captivity.

- The aquaculture sector continues to grow in the region, even though its production does not exceed 13% of total fish production. Chile is the largest producer in the region. Its production, based on the industrial farming of salmon and trout, is mainly aimed at export markets. Brazil is the second largest producer, with a growing volume of Amazonian fish and tilapia (FAO 2012a and 2012b).

- Currently, more than 100,000 rural families in LAC at least have a fishpond for the generation of protein, bio-fertilizers and supplementary income. The main species cultivated are freshwater fish of low trophic level such as tilapia (Flores Navas 2012).

- Climate change is a threat to fisheries and aquaculture in LAC. However, its effects on fish production have so far received little attention compared to other primary production sectors.

Trends

The region's most important marine fisheries by volume maintain a slight downward trend

Since 1970, landings in marine waters have remained steady at around 80 million tonnes worldwide. However, the percentage of overfished species has increased (from 10% to 32%) and the percentage of species not fully exploited has decreased (from 40% to 15%), which is reflected in the remarkable changes in landings by country, fishing area and species (FAO 2012a and 2012b). Fish production in LAC has been strongly affected, with total landings down from 20 million tonnes in 2005 to 12 million tonnes in 2010. During 2011, there was a slight recovery, reaching 16.5 million tonnes, but so far this does not constitute a trend (FISHSTAT 2013). Therefore, overfishing remains an issue that requires immediate attention despite the region's wealth of resources.

Two of the main species caught in the region and around the world show signs of overfishing. One of them is *anchoveta* of the southeastern Pacific Ocean, a species that is highly sought after by processors in Peru and Chile to produce fishmeal and fish oil. As a result of overfishing, *anchoveta* landings decreased from 10.7 million tonnes in 2004 to 4.2 million in 2010.

Due to this situation and the El Niño phenomenon, Peru has taken measures aimed at recovering the biomass of this resource. Firstly, it strictly regulates fishing season closures and charges an annual fee per vessel in order to stabilize the capacity of the fleet and processing plants (FAO 2012a and 2012b). In addition, in 2012 industrial fishing was banned within the first five nautical miles from shore, which is where 65% of the *anchoveta* biomass is found, prompting an apparent rapid recovery of the species. *Anchoveta* production rose 97.8% between 2010 and 2011 to seven million tonnes (FISHSTAT 2013). Of course, this annual turnaround does not establish a definitive trend – this species is still considered fully exploited.

Another of the main fish species affected is the Chilean jack mackerel (*Trachurusmurphyi*). In 2008, it was in sixth place on the list of the ten most landed species, but it currently does not even come tenth. After having reached a maximum of five million tonnes in the mid-1990s, total landings fell to 1.5 million tonnes in the next decade, to reach an all-time low of 200,000 tonnes in 2011 (FISHSTAT 2013). This species is widely distributed in the South Pacific and can be found in exclusive economic zones and even in deep international waters, which means that in addition to benefitting the industrial sector it has generated a significant impact on the incomes of the local fishing community. However, it is considered to be overfished with little chance of recovery in the medium term (FAO 2012a and 2012b).

Another concern is the situation of benthic resources (species that live on the seabed), which, because they are harvested almost exclusively by artisanal fisherfolk, are of great economic and social importance in the region. The rate of decline in the production of some species, like certain types of clams, has recently increased since contributing more than half of the global catch of bivalves at the beginning of the 1990s.

Due to the social importance of artisanal fishing, there have been important efforts to conserve some benthic species. Argentina and Uruguay have conducted studies in this regard and Chile has taken important steps with a policy of co-management of resources, which has been in place for more than 10 year, with positive results from the biological standpoint.

For example, production of Chilean abalone (*Concholepasconcholepas)*, an endemic benthic species, increased from 200 tonnes to more than 4000 in 2011 (Arias *et al.* 2011 and FAO 2012a).

In the Caribbean, many marine fisheries are in crisis. Most of the region's fishery resources are being intensively exploited by a large number of small-scale fisherfolk. In addition, there is high demand for fish and seafood for the tourism industry, which is the main economic activity in many countries of the region. Some species, such as lobster and shellfish, are subject to pressure in some areas due to increasing demand for exports, which has resulted in their over-exploitation. In response, countries in the region are taking the first steps to protect this resource. In 2009, the Central American countries and the Dominican Republic agreed on common regulations for the management of lobster fishing. In addition, given the economic and social importance of this crustacean, Central American countries recently took steps to ban lobster diving, which today is widely practiced in the area and causes numerous fatal accidents among fisherfolk.

Low levels of catches of some species have been offset by a recovery in catches of other species, such as *Pleoticusmuelleri*, a type of shrimp with a high value that is harvested in Argentina. Even though volumes of this species recorded a significant drop in 2005, six years later they had recovered and even multiplied tenfold, registering a new peak in 2011. This situation is due to sustainable production plans implemented by the country's authorities to help the recovery of the species (FAO 2012a and 2012b).

Other species such as hake, cephalopods (octopus and squid) and Antarctic krill are subject to relatively low fishing pressure and their production could be increased, provided that adequate management plans are used to ensure an efficient and sustainable supply (FAO 2012a and 2012b).

Aquaculture production of salmonids in LAC is in full recovery mode but shrimp production is growing slowly

After reaching an all-time high of 60 million tonnes in 2010, global aquaculture production has continued to grow but at a slower rate than in previous years due to health and environmental risks, which negatively affected the production of oysters in Europe, salmon in Chile and shrimp in Africa, Asia and South America during the period 2008-2010. Even so, LAC has increased its share of aquaculture production worldwide from 1.4% (200,000 tonnes) in 1990 to 3% (2.4 million tonnes) in 2011.

This is partly the result of marine aquaculture, which grew during the period 2000-2006 at an average annual rate of 18%. In recent years, it has also been due to sustained growth in freshwater production, which rose by an average 19% per year between 2008 and 2011. Following a decline between 2008 and 2010, marine production grew 26% in 2010-2011 through the use of best practices and stricter controls (FAO 2012a and 2012b, and FISHSTAT 2013).

According to FISHSTAT (2013), in 2011 South America maintained its leadership with 88% of regional aquaculture production. This meant the region produced 2.1 million tonnes, of which Chile, Brazil and Ecuador contributed 90%. In the same year, the participation of Central America reached 11% at the regional level and the Caribbean contributed just 1%, with production of 256,000 and 28,000 tonnes, respectively. During the period 2008-2011, only South America showed sustained growth, with an average annual growth rate of 11%, while the Caribbean experienced a decline and Central America remained stable.

Aquaculture production in LAC is currently dominated by species grown in the marine environment, which accounted for an average 54% of regional aquaculture production in 2008-2011, although this is down from 60% in the period 2001-2008. Meanwhile, freshwater production increased by seven percentage points to 32% of total production in the period 2008-2011 compared to the previous period. The remaining share was contributed by the cultivation of species in brackish water.

A similar trend has been observed in South America, given that marine aquaculture represented close to 70% of total production during the period 2001-2008, but since then its participation has declined to 52%.

Meanwhile, in Central America the participation of marine species in continental aquaculture production did not exceed 10% until 2004, but it has increased rapidly to about 50% currently. During the past two years, marine production has decreased slightly in favor of freshwater production, which has reached 30% of total output.

In the Caribbean, almost all of the production in 2008 was in freshwater, but the figure was down to 75% by 2011. The total volume also decreased from 38,000 tonnes in 2008 to 23,000 tonnes in 2011. Marine production, after a rebound observed between 2008 and 2010, fell 25% in 2011 to approximately 2000 tonnes.

Chile is the largest aquaculture producer in LAC. Its production rebounded to 969,539 tonnes in 2011, maintaining its regional leadership with 40% of total production (FISHSTAT 2013). In 2012, the country achieved a new record of production, reaching one million tonnes of aquaculture products, of which 804,000 corresponded only to species of salmonids (SERNAPESCA, 2013), making it the leading exporter of these species at the regional level. The production of Chilean salmonids accounted for 27% of regional aquaculture production in 2011. After reaching 630,000 tonnes in 2008, Chilean production decreased to 460,000 tonnes in 2010 due to the ISA virus.

Today the industry is in recovery and production reached 800,000 tonnes last year (SalmonChile 2013). The comparative advantage of Chile includes its low cost of labor and inputs, allowing it to compete with traditional producers such as Norway, its main competitor, where the decreasing availability of appropriate sites has limited growth of the sector. Aquaculture production in Chile has generated an economic impact that benefits nearly 50,000 rural households in the south of Chile where production is concentrated (SalmonChile 2013).

Unlike salmonids, the cultivation of whiteleg shrimp (*Litopenaeus vannamei*) has expanded widely at the regional level and is practiced by 15 of 34 countries in LAC (OLDEPESCA 2012). After salmon, it is the second most important species in the region, accounting for 22% of aquaculture production. From 2008 to 2011, regional production increased from 44,700 tonnes to 522,000 tonnes. In the same period, the participation of South America increased from 60% to 70% of LAC shrimp production, while that of Central America decreased from 39% to 30% and the Caribbean fell from 0.8% to 0.5%. However, in Central America it is the main species cultivated, with production of 156,000 tonnes in 2011, or 20,000 tonnes less than in 2008. The Caribbean is the only region where the production of whiteleg shrimp is not significant, which is why producers have recently incorporated polyculture (tilapia-shrimp) to maintain profitability (FAO 2012a and 2012b).

The region's main producers were Ecuador, Mexico and Brazil, which together account for more than 80% of total production. While in Ecuador (which accounts for 50% of the regional total) production has been increasing (it rose from 150,000 in 2008 to 260,000 tonnes

in 2011), in Mexico and Brazil production has declined (from 130,000 and 70,000 tonnes to 109,000 and 65,000 tonnes, respectively), due to sanitary problems and a decline in international prices. Meanwhile, even though Mexico has shown a slight rebound, with production up 5% in 2011, production continues to be lower than in 2008 (FISHSTAT 2013).

Production of freshwater fish, especially by small-scale producers, is increasing

Worldwide, freshwater aquaculture has steadily increased its share of total aquaculture production from 45% in 2008 to 47% in 2011. LAC has formed part of this trend, with freshwater fish production increasing from almost 500,000 tonnes in 2008 to 840,000 tonnes in 2011 (FISHSTAT 2013).

South America is the largest producer of freshwater fish. Production in the region has shown strong and continuous growth, from 280,000 tonnes, or 72%, in 2006, to 740,000 tonnes (88%) in 2011. This trend has not diminished and last year production was 30% higher than in 2010 (FISHSTAT 2013).

The percentage of freshwater fish produced in Central America fell from 20% in 2006 (80,000 tonnes) to 9% (60,000 tonnes) in 2011. Even so, the region's production showed a small rebound in 2011 reaching 76,000 tonnes, or 23% more than the previous year. The Caribbean, for its part, has shown a steady decline in production since 2008, falling from 40,000 tonnes to 30,000 tonnes (FAO 2011).

Freshwater fish are mainly farmed by small-scale producers categorized as limited-resource aquaculture producers (ARELs), or micro and small-scale aquaculture enterprises (AMYPEs). Although both groups consist of small-scale producers, ARELs play a more significant role in self-employment and food security in rural families in the region, while AMYPEs play an important role in the revitalization of local economies. As a result, freshwater fish are becoming an important revenue generator for small-scale producers in Latin America.

There are an estimated 100,000 small-scale producers in the region, which means that an equal number of families depend directly, partly or exclusively on aquaculture. According to a recent FAO study (2011), the main limitations of these producers are related to the lack of access to technologies, extra-community markets and capital for the purchase of inputs. The lack of financial assistance programs and policies limit the sustainability of this important sector (FAO 2011).

Growth in aquaculture in the region is led by Brazil, which produces 64% of freshwater fish in the region, of which 75.4% is produced by small-scale enterprises. The country has maintained an average annual growth rate of 20% since 2005. Brazil's main aquaculture product, tilapia, is produced to meet demand in the domestic market, which has been growing since policies were introduced in 2003 to boost consumption through measures such as the inclusion of fish in school lunch programs (FAO 2011).

Prices for fish products are rising at the global and regional levels

Fish and fish products are amongst the most traded food products in the world. Fish are produced mainly in developing countries for export to developed countries, although consumption in producing countries is rising, which is why prices for fish products are closely related to the development of global markets. World trade in fish and fish products has grown considerably in value terms, rising from USD

8 billion in 1976 to USD 102 billion in 2008, with annual growth rates of 8.3% in nominal terms and 3.9% in real terms.

In 2009, the value of total trade in these products fell by 6% from the previous year as a result of the global economic downturn, which affected prices and consumer confidence in key markets. Meanwhile, the volume of trade, expressed in live-weight equivalent, increased 1%, or about 55.7 million tonnes. The trend was not homogeneous, however, with many developing countries reporting an increase in demand and imports.

In 2010, trade recovered strongly to USD 109 billion, with an increase of 13% in value and 2% in volume compared with 2009. The difference between the growth in value and volume reflects the increase in prices of fish during 2010. That year also showed a decrease in the production and trade of fishmeal (FAO 2012a).

In the LAC region, the situation has been similar. The value of fish production increased from USD 2 billion in 2000 to almost USD 7 billion in 2008. This positive trend was interrupted during the 2008-2010 period, when the value of production remained around USD 7.8 billion annually. This can be explained by the economic crisis that affected many developed countries, which are the main consumers of fish products (OLDEPESCA 2012).

Due to the decrease in the rate of growth of aquaculture production, the stagnation of wild fisheries and the continued increase in demand, the pressure on fish products has increased since 2010, which has caused an increase in prices that reached a new peak in 2011. Despite economic instability in many of the world's major economies, higher prices and strong demand in developing countries increased the value of trade in 2011 to over USD 125 billion – the highest level ever recorded (FAO 2012a). This clearly established that the fish trade is closely linked to the general economic situation.

High prices reported since 2010 have stimulated aquaculture production in the region. It is very likely that during 2013 production of salmon in Chile will reach a new record of 800,000 tonnes. It has even been estimated that in 2013 there will be an overproduction of fish, which would lower prices by around 25% over the previous year. As a result, most salmon producers have announced a reduction in the rearing of juveniles for the next harvest. A similar situation occurred in Brazil and Mexico, where shrimp farming was reduced for commercial reasons, since prices in the US and European markets had decreased substantially. As a result, these countries decided to sell much of their production in the domestic market, where prices have improved.

The production of freshwater fish in LAC has also faced a decline in prices due to higher imports of the Asian catfish, *Pangasius*, which is imported in large quantities by most countries of the Americas at prices significantly lower than species grown locally, such as tilapia. This has caused major problems for regional producers.

There is growing concern about the effects of climate change on fisheries and aquaculture

Although its real consequences are not yet clear, climate change is a general concern for the industry. Determining which group, region or species is more exposed to the effects of climate change means quantifying their vulnerability, which should be the first step in the development of policies for climate change adaptation and mitigation (FAO 2013b).

Globally, many studies have analyzed the effects of climate change on the environment, economy and society, but there is still a significant degree of confusion and debate over

the methods of assessment that should be used to develop and coordinate effective policies (FAO 2013b).

There have been various studies that have analyzed, indirectly, the effect of climate change on the wild fishing and aquaculture sector. For example, there have been studies examining the effect of natural disasters caused by the rise in sea levels, the increase in the severity and frequency of storms, and changes in patterns of circulation of ocean currents, rain and river flow. Several studies have also been performed concerning the changing physical and chemical conditions in the ocean, such as research on vulnerability to acidification, temperature change and the concentration of oxygen and nitrogen (FAO 2013b). However, the specific effects of this phenomenon on the production of fish for human consumption have not yet been investigated. In fact, the fisheries sector was mentioned only once in the report by the Intergovernmental Panel on Climate Change (IPCC) in 2007, which indicated the probability of changes in ecosystem productivity and in fisheries in general (FAO 2013c).

At the regional level, it is difficult to establish trends in the effects of climate change on fishing and aquaculture when not enough information is available. Most of the information is at the community or subnational level, but it is not extensive enough to evaluate national or regional approaches to policy development (FAO 2013b). The few studies conducted in the region include one that focused on the effect of acidification in Caribbean countries, where exploitation of coral reef resources continues despite the fact that this ecosystem has proven to be highly vulnerable to acidification of the oceans (McConney 2012).

Although 27 countries have submitted the Second National Communication under the United Nations Framework Convention on Climate Change (UNFCCC) and seven are preparing their Third Communication, the fisheries and aquaculture sector is generally poorly represented, even in countries where the sector is important to national GDP.

ECLAC (2009) also conducted an analysis of the effects of climate change on the coastline of LAC, but without considering its effect on the production of fish. Other initiatives are underway, such as FAO's project to determine the impacts of climate change on fishing and aquaculture and the capacity for adaptation in various countries and regions of LAC. In this regard, studies are being carried out in Central America (Nicaragua, Honduras and El Salvador) and the South Pacific (Peru and Chile).

Prospects

If precautionary measures are not taken, the growing demand for fish could mean that most marine resources will continue to be overexploited

Currently, 75% of marine resources are either fully exploited or over-exploited. The increase in per capita consumption in developing countries will continue to put greater pressure on traditional resources and increase the demand for non-traditional products, which will be reflected in changes in landings per country, fishing zones and species (FAO 2012a and 2012b).

The oceans will not be able to meet the higher demand for fish from the world's population. Considering the current level of productivity in the oceans, and keeping the rate of exploitation constant, wild fish landings will not exceed 90 million tonnes in the medium term, even though it is predicted that by 2020 an additional 23 million tonnes will be needed to satisfy global demand.

In the short term, the supply of fish from wild fisheries could be even more restricted if some

stocks are protected to prevent overexploitation. The European Union, the largest consumer of fish as a bloc, has gradually reduced its fish production because of overexploitation along its coasts. As a result, it has recently decided to establish a new common fisheries policy, which establishes sustainable rates of production from 2014 (European Commission 2013).

If countries in LAC do not establish policies to halt the depletion of fish stocks, many of their main species could run a severe risk of overexploitation. Such is the case of *anchoveta* and Chilean jack mackerel in South America, pelagic species that are the main input for the production of fishmeal and fish oil. It is expected that demand and prices for these products will increase over the next few years. Of these two species, *anchoveta* has the greatest possibility of recovery thanks to the fact that in 2012 the Peruvian government established strict regulations to protect the area (first five nautical miles) where 65% of the biomass of this resource is concentrated, and to limit the amount available for capture to the lower limit of the confidence interval estimated for this resource (IMARPE 2013).

The situation for Chilean jack mackerel is more serious, which is why the Chilean government has taken the first steps with the new Fisheries Act, which sets quotas determined by a scientific committee. At the same time, given that the fish migrates beyond Chilean borders, it has urged the governments of Peru and China, two of Chile's main competitors in the production of this resource, to sign a regional agreement on the conservation and management of deep-sea fishery resources in the southern Pacific Ocean.

In the Caribbean and Central America, lobster (*Panalirus Argus*) faced a similar danger since rising demand from the tourism sector had caused its overexploitation. During 2010, the lobster population fell by 40%, which left the species in a critical state. Bans on lobster fishing, introduced in 2010, have helped the species to recover, however. It is estimated that 15% of the lobster stock has already recovered. The ban applied to Belize, Costa Rica, Guatemala, Honduras, Nicaragua, Panama and Dominican Republic. The reproduction and sustainability of the species has also improved, as well as its availability for export.

Increased aquaculture production could increase pressure on the main pelagic species in South America due to higher demand for fishmeal

Fish farming should meet higher demand for fish in the future. In 2013, global annual per capita fish consumption is nearing 20 kg, with almost half of this amount coming from aquaculture. Studies have established that during the period 2014-2021 fish production from aquaculture will reach 79 million tonnes, i.e., 33% more than current production (FAO 2012a and 2012b). This increased production could meet the higher demand is expected in this period.

The main protein input currently used for fish feed in aquaculture is fishmeal. This comes from the processing of pelagic fish, such as jack mackerel and the South American *anchoveta*. Due to the growth expected in the aquaculture sector, demand for fishmeal and fish oil should rise. It has been estimated that the production of fishmeal needs to increase 15% by 2021 (Jackson 2012). However, the increased pressure caused by the direct consumption of fish will restrict the availability of pelagic fish for producing fishmeal. For this reason, there are multiple research groups in the region, and the world, dedicated to the search for alternative sources of protein that could replace, at least partially, fishmeal in feed for animals, including fish.

Despite the increase in the consumption of freshwater and omnivorous species, mainly in the Asian market, consumers still prefer carnivorous species or species with a high trophic

level (such as salmon, trout and tuna), which pushes up their market value and demand. The production of this type of species is due to the high value of exports to more affluent markets. During 2011, production of these species reached a new record (FISHSTAT 2013).

Omnivorous species, with a low trophic level, require 3% fishmeal in their feed; by contrast, carnivorous species with a high trophic level need 20-25% of fishmeal in their diet. Therefore, it is expected that aquaculture businesses will further increase pressure on fishmeal and fish oil (FAO 2012a and 2012b). In LAC, the highest proportion of aquaculture production comes from farm-raised salmon (Chile) and crustaceans (Brazil, Mexico and Ecuador), two groups of species that require the most fishmeal to produce.

In spite of this, due to increasing demand for fish for human consumption it is expected that the portion of captured fish used to produce fishmeal and fish oil will fall from 22% to 17% by 2021 (FAO 2012a), even though demand for fishmeal is set to rise by 15% during the same period (Jackson 2012). Therefore, in order to meet this increase in demand fish waste must be reduced. It is estimated that 87% of the increase could be covered by better utilization of waste (FAO 2012a and 2012b).

The probable shortage of pelagic fish intended for the production of fishmeal and fish oil, and the resulting increase in the price of fishmeal, could become a limiting factor in the development of aquaculture. In order to avoid this situation, technological efforts are being made to reduce the medium-term demand for fishmeal. For example, over the next 10 to 12 years, the inclusion of fishmeal in the diets of different species of carnivorous crustaceans and fish could be reduced by between 10% and 22%, and between 2% and 5% in the case of omnivorous fish. This is also expected to improve Feed Conversion Efficiency (FCE) indices by 2020 for many aquaculture species that depend on industrial feed, like carp and catfish.

According to the FAO (2012a), the sustainability of the aquaculture sector in the medium-term is likely to depend on the supply of carbohydrates, oils and animal and plant proteins for the production of fish feed. Therefore, the aquaculture sector should place greater emphasis on ensuring a sustainable supply of animal and plant ingredients.

If these predictions are accurate, the amount of fishmeal used in feed could be reduced by almost 6% by 2020. Even so, if the rate of growth in the aquaculture sector continues, it will require increasingly more feed based on these type of inputs. Coupled with the increased demand for forage fish for direct human consumption, bait and aquaculture or agricultural uses, this situation could spur overexploitation of pelagic fish that are important for the fishing industry in South America. Given that forage fish are the ecological basis of the marine ecosystem, their overuse could have serious consequences for the marine environment that are difficult to measure.

Overexploitation and greater demand for fish could make prices more volatile

Stagnation in supply and an increase in demand could lead to higher prices. Since the beginning of this decade, fish production has not been able to keep pace with demand, which has caused prices to rise. This trend could continue through 2020 (FAO 2012a). In addition, higher prices for fish products could increase the risk of volatility.

With regard to the supply of fish, by 2022 total landings of wild fish are expected to increase by just 5%, while aquaculture will grow 35% from the average observed for the period 2010-2012 (wild fish landings will reach 63 million tonnes and aquaculture 85 million tonnes by 2022) (OECD 2013).

Due to the growth expected in the aquaculture sector, demand for fishmeal and fish oil should increase. It has been estimated that fishmeal production should be 15% higher by 2021 (Jackson 2012). However, increased pressure on the direct consumption of fish will restrict the availability of pelagic fish for fishmeal, and thereby push up its market price (FAO 2012a and 2012b). For example, the average price of fish oil in the last quarter of 2012 was USD 2183 per tonne, which was 43% higher than the average price in the last quarter of 2011. The increase in demand for fish oil for aquaculture and human consumption, along with weak supply in 2012, are probably the main reasons for the record prices reached in 2013.

The restriction in the supply of fish and rising costs of feed for the main commercial species are causing international prices of fish products to rise. While the price observed for shrimp has dropped over the past few years, in the short term prices are expected to rise sharply for this and other farmed species, such as salmon and certain bivalves, due to problems of supply and rising costs of feed. Higher prices have also been observed in some species of wild fish, like tuna. As a result, during the past two years the fish price index has risen to exceptional levels. In the coming months, world fish prices are likely to remain at high levels due to the limitations of supply for some important species (FAO 2013a).

Thanks to research carried out to reduce the dependency of aquaculture on fishmeal and fish oil, in the medium term an effective substitute could be found using alternative ingredients, which would help lower the cost of production of species like shrimp and salmon.

At the regional level, the volatility in catch sizes is also a consequence of environmental phenomena, such as temperature variations due to El Niño, which sporadically affects fishing on average one or two years in every decade (NOAA 2012). Likewise, global warming affects the temperature of the oceans and, therefore, the intensity of the impact of El Niño. In addition, when resources are in a state of overexploitation, they are most vulnerable to the effects of these environmental phenomena.

It is necessary to carry out further research on this issue, and to draw up environmental and financial risk management plans that consider these conditions.

There is no consensus on the effects of climate change due to insufficient scientific data

Due to the lack of information about the effects of climate change on fisheries and aquaculture, it is difficult to distinguish the impacts of "normal" climate variability from those associated with climate change. This, in turn, complicates the prediction of future scenarios, including the frequency and intensity of hurricanes and big storms, as well as the El Niño phenomenon.

In general, one of the most important problems that increases the exposure and sensitivity of fisheries to climate change is the overexploitation of many species. The higher the level of exploitation of a species, the lower its resilience to environmental phenomena (FAO 2013b). This situation occurs in most countries and in most of the ecosystems of the region. In this regard, the greatest concern is about *anchoveta* and jack mackerel in the South Pacific, and lobster in Central America and the Caribbean. However, it is difficult to separate these effects from those caused by human activity.

Allison *et al.* (2009) analyzed the vulnerability of the fisheries sector in 132 countries to the impact of climate change through 2050. From this study, one of just a few in the region, it emerged that the most vulnerable countries in LAC are Peru and Colombia. Even so, the analysis of oceanographic fluctuations is very

uncertain and appears to be just as important as the longer-term trend imposed by human-induced climate change, which is why it is not currently possible to project interdecadal variability in the future (FAO 2013b).

Given that the vulnerability of aquaculture to climate change is at least partly determined by the manner in which projects are managed, only general recommendations can be given. However, a well-planned aquaculture sector that is managed with good practices, which is strategically located in an area where there is good sanitation management, is generally better prepared for climate emergencies and other unforeseen events.

Policy recommendations

Risks that may cause price volatility for fish products should be managed

To manage the risks of price volatility, it is necessary to address their root cause. As mentioned in the Prospects section, it is likely that the risks of volatility will increase as a result of an increase in the price of fish. The main cause is the uneven growth of supply and demand, coupled with higher production costs, mainly due to an increase in the price of fishmeal. Therefore, in order to manage risks that may lead to price volatility in the sector, policies are needed that contribute to increasing the supply of fish and lowering production costs.

As a first step, one proposal is to lower costs in the region's existing aquaculture production. This can be achieved by reducing dependency on fishmeal and fish oil. The technology has already been developed, but it is necessary to strengthen assistance programs for aquaculture in the region. Technology transfer should target technical advances that allow the efficient use of low-cost feed alternatives to fishmeal and fish oil. This effort should focus mainly on producers dedicated to the breeding of species that are highly dependent on fishmeal, such as the carnivorous species produced in large amounts in the region, including shrimp and salmon, which account for 49% of regional aquaculture production. Given that these products are being developed by large companies in Chile, Ecuador, Brazil and Mexico, the companies in question could partner with state institutions to hold seminars and workshops and make technological visits, all with the aim of sharing experiences and defining targets for reducing fishmeal consumption.

In addition, it is necessary to increase the supply of low-cost fish. A way to achieve this is through the development of freshwater aquaculture. This has been a relatively easy point of entry for the development of ARELs and AMYPEs, due to the low level of investment required and the development of diets based on local resources.

As well as generating extra income for small-scale producers, these products play an active role in ensuring the food security of areas with low access to high-quality animal protein. Therefore, this type of measure could become more important in agricultural areas with low access to marine products, such as Bolivia, Paraguay, the interior of Argentina, Brazil, Peru, and the Caribbean countries in general. In these sectors, policies must take a multisectoral approach (with aquaculture inserted within family farming), considering the available inputs and the local environmental conditions.

Another way to increase the supply of low-cost fish is to feed the local population with fish of low economic value, such as anchovies and sardines. Paradoxically, pelagic fish, such as those mentioned previously, are used as inputs for the production of fishmeal and fish oil. These

are fish that have the richest composition in proteins and healthy fatty acids (omega-3, EPA and DHA) and their consumption contributes to the reduction of cholesterol, triglycerides, blood pressure and insulin resistance. In comparative terms, eating those fish is much more beneficial than consuming chicken, turkey or pork. However, while LAC is the largest producers of this type of fish, per capita fish consumption in the region is well below the world average (on average 9 kg per year in LAC versus 19 kg worldwide).

Therefore, it is necessary to change the current situation whereby developing countries are the main exporters of inedible fish products (developing countries as a whole account for three quarters of global exports of inedible fish, with fishmeal exports making up a third of the total). In many countries of the region, the population could be nourished with low-priced fish caught by their own fishing fleets. For example, Peru's *A comer pescado* ("Let's eat fish") program aims to promote the consumption of low-cost fish, such as *anchoveta*, by low-income families in the Peruvian sierra. In addition, a 2012 law created a five-mile exclusion zone for artisanal fishing vessels, which is where 65% of the biomass of the anchovy is found. Under this law, fish caught within this area must only be used for direct human consumption.

In summary, policies are needed to stimulate the local consumption of fish with low economic and high nutritional value, mainly by the most vulnerable sector of the population. In this regard, the state should play a more active role in ensuring the food security of the population, as recommended in the voluntary guidelines on responsible governance for land tenure, fisheries and forests in the context of national food security (FAO 2012c).

Measures are needed to promote the sustainable management of fisheries and aquaculture

The environmental consequences of increasing the supply of fish should be considered (Rockström *et al.* 2009). This means it is essential to establish limits for the operation of the fish food industry, in such a way that production is sustainable.

Some 49% of the fish production in LAC is highly dependent on fishmeal and fish oil. This production is comprised of carnivorous species of high commercial value, such as salmon and shrimp. The production of fishmeal and fish oil involves the capture and processing of pelagic fish known as forage fish. The mass consumption of these inputs has led to overexploitation of pelagic fish, which are the basis of the marine food chain. The main producers of fishmeal and fish oil globally are Peru and Chile. In this regard, it is paradoxical that higher production of salmon and shrimp in the region may have an indeterminate but high environmental impact on marine fish in the Pacific Ocean.

In this context, it is necessary to determine how much of which species can be produced. It is acceptable to produce species with a high trophic level if their market value is attractive and they generate economic and social benefits for the country, but there should be a production limit. Clearly, the limit for species of lower trophic level (such as freshwater fish, which can feed on vegetable inputs) should be greater than the limit for species that require a greater percentage of fishmeal in their diet.

Sardines, *anchoveta* and Chilean jack mackerel are the major inputs for the production of fishmeal in LAC. The protection of these species is essential for the maintenance of a healthy ecosystem in the Pacific marine environment.

Without marine resources, no aquaculture is possible. Higher fishmeal and fish oil prices (due to insufficient supplies) could cause the economic powers to exert greater pressure on the production of these species. Despite measures to protect *anchoveta* in Peru and jack mackerel in Chile, it is important to maintain the monitoring of catch limits, since these species are fully exploited and overexploited, respectively.

The artisanal fishing community should be supported through the use of a special label for its products that would allow consumers to differentiate them from aquaculture products

Products from wild fishing and aquaculture are seen as equivalent goods, meaning that the consumer does not appreciate differences between the two. In other words, once a minimum quality standard is met, consumers see no difference between fish produced on a farm and fish caught in the ocean. Currently, both types of fish are considered commodities, like alternative products such as meat and animal feed.

Aquaculture is a sector in constant growth and is becoming an alternative to the consumption of animal protein. The sector generates an infinite number of products due to the breeding of a large number of species. Some of them are highly specialized and go to more demanding markets, which are willing to pay a higher value. Others, however, such as some freshwater species, are produced at low cost and there is no reason why they cannot be considered basic commodities.

Fish caught through wild fishing for human consumption should not be considered commodities, since these are the last wild resource remaining for mass consumption. It is a product that usually comes from areas of low pollution and is fed naturally.

In LAC, industrial fishing fleets catch pelagic fish for processing into fishmeal and fish oil. Peru and Chile are two of the leading exporters of fishmeal in the world. Meanwhile, artisanal fisheries, which provide a livelihood for close to one million families in the region, catch fish that are usually destined for direct consumption. Their products are caught through minimally invasive techniques and their fishing efforts are focused on specific areas. Even so, many stocks exploited by artisanal fisherfolk are in a state of overexploitation, so countries like Argentina, Chile and Mexico have made important efforts to implement a sustainable catch limit.

It is essential to generate an economic incentive to encourage fisherfolk to exploit their resources sustainably, but also so they can earn enough to support their families. If they do not receive a reasonable profit for their fish, they will be forced to catch more to improve their income. One way is by ensuring that fisherfolk get a fair price, which can be achieved by means of labeling, to differentiate their products in the market.

The new common fisheries policy of the European Union involves new marketing standards on labeling, quality and traceability, which will offer consumers clearer information about the provenance of the fish. It also aims to help producers, fish processors and distributors to get a fair price for their output and at the same time promote sustainable fisheries. Certain label information is mandatory, for example, to differentiate the products of wild fishing and aquaculture. Other information will be voluntary. The aim is to implement the new regulations on labeling in 2014 (European Commission 2013).

Although this is a new area, in 2005 the FAO issued guidelines for the eco-labeling of fish and fishery products from wild marine and continental fishing, as well as aquaculture (FAO 2005). Certification and eco-labeling schemes have arisen in response to concerns about environmental sustainability and the clear reduction in many of the world's major fish stocks.

Due to the increased awareness and the interest of consumers in matters relating to the environment, eco-labeling and certification systems could improve access to certain markets and offer a higher price that better reflects the real value of fish and fish products. Certification can create an incentive for fisherfolk to use responsible fishing practices and receive a fair price for their products.

The Marine Stewardship Council (MSC) was established as follow-up to the guidelines proposed by the FAO. A non-governmental international organization, it aims to promote environmentally responsible, socially beneficial and economically viable fishing all over the world. The MSC certificate of responsible fisheries management helps products to obtain a better price in the most demanding markets. In order to obtain the certificate, minimum requirements must be met, however.

Currently, 7% of fisheries in developing countries have MSC certification. Some cases of regional certification are Argentine anchovies and hake, Mexican sardines and lobster, and the Patagonian scallop. Chilean hake and mussels are currently being studied, as is Mexican tuna.

It is recommended that authorities analyze and promote the certification of artisanal fisherfolk as a tool to protect their livelihoods and to promote sustainable fishing practices in the region.

Climate change mitigation and adaptation requires more information about its likely consequences

In LAC, policies should be designed to strengthen the knowledge base regarding the impact of climate change on fishing and aquaculture on a national and regional scale. Better data is obtained from studies carried out at the community level, but developing policies at the national or regional level requires joint studies at the subnational level.

Regional results can be obtained through coordinated efforts to manage fisheries resources and aquaculture in the region. Only in this way can the changes needed to reduce exposure to climate change be made while helping fisherfolk and aquaculture producers to adapt. For this reason, legal and regulatory frameworks are needed that facilitate measures of this kind (FAO 2013b).

The exchange of knowledge is vital to achieving the desired results, which means building capacity at all levels (communities of fisherfolk and aquaculture producers, private and public sector). This can help to draw the attention of authorities to fishing and aquaculture in terms of the sector's need to adapt to climate change and its potential as an alternative means of employment/adaptation for other sectors.

Conclusions

It is important to define clear policies regarding wild fishing and aquaculture production.

Given the risk of volatility in the fish market, measures to increase fish supply and reduce production costs are needed. These should include measures to promote aquaculture production by reducing producers' dependence on fishmeal and fish oil, which is a key factor in higher production costs. In addition, measures are needed to increase the supply of fish of low economic value, redirecting the use of pelagic fish for human consumption and not for the production of fishmeal, while also encouraging freshwater aquaculture.

In order to promote aquaculture, authorities should determine sustainable production limits. Without marine resources, no aquaculture is possible, especially if the type of species farmed require a lot of fishmeal. In this regard, it is important to coordinate efforts between countries to establish sustainable production limits for wild fishing and aquaculture.

In order to protect small-scale fisheries, this document proposes that wild fishing for marine resources should be sustainable but also profitable. In this regard, small-scale fisherfolk are selective, and therefore cause less damage to marine ecosystems. Unfortunately, however, their products are not differentiated by consumers and instead are regarded as commodities. One way to develop sustainable fisheries and increase the value of fish products is through the use of eco-labeling, as is already happening in the EU.

Due to the lack of information about the effects of climate change, fisherfolk and aquaculture producers are unaware of potential threats and do not know how to cope with the risks involved. In order to mitigate and adapt to changes associated with climate variability in general, it is necessary to identify and quantify its likely consequences in a statistical manner at the regional and national level.

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Chapter 2.4: Forests

Forests

Forest conservation and sustainable management represent an important development opportunity for family farmers.

Current regional trends suggest that, in the medium- and long-term term, forests will play an increasingly important role in the economic development and food security of rural communities that depend on family farming.

Facts

- Forests and the trees normally found on small farms play a key role in rural livelihoods by providing goods and services (firewood, wood for construction, fruits, fungi, wildlife, food for livestock, energy, protection for the soil and crops, among others) that are used directly on farms or sold in local markets, and which generate part of the income of rural families.

- The countries of the region, especially those with tropical forests, are particularly rich in biodiversity and have a large number of plant and animal species with potential for the extraction of non-timber forest products (NTFP), which could generate even more revenue than the sale of timber or land-use changes (FAO 1996). Many of these resources are being underutilized.

- Energy production accounts for 81.3% of the wood consumed in Central America, whereas in South America the figure is approximately 50% (FAO 2011). Much of this energy is used by rural communities for cooking and is therefore an important element of their food and nutritional security.

- Supporting small-scale farmers to generate new sources of income from forests, and at the same time recover degraded soils, continues to be a priority for many countries of the region, including Colombia (Law 139, 1994), Chile (Law 701, 1998), Nicaragua (Tax Law, 2012), and Paraguay (Law 536/95).

- Payment for environmental services, and in particular the global initiative on Reducing Emissions from Deforestation and Forest Degradation (REDD+), represents a great opportunity to promote the conservation of the region's forests and improve livelihoods in the communities that depend on them.

Trends

The loss of forest cover and forest degradation have reduced development opportunities in rural areas of Latin America

Although the rate of annual loss of forest cover in LAC has slowed since 2000-2005, it still accounts for over 70% of deforestation worldwide. In 2005-2010, forest cover in the Caribbean increased slightly (0.6%) but the annual rate of deforestation in Latin America reached almost four million hectares, which represents a decrease in forest cover of 0.4% (FAO 2010).

Table 8. Annual variation in forest cover, 2005-2010

Latin America and the Caribbean (LAC)	Area of natural and planted forest, 2005 (million ha)	Area of natural and planted forest, 2010 (million ha)	Annual variation in forest cover (in 000 of ha/ year)
Mexico	65,6	64,8	-155
Central America	20,7	19,5	-249
Caribbean	6,7	6,9	+41
South America	882,3	864,3	-3581
Regional variation	975,3	955,6	-3944
World variation	4060,9	4033	-5581

Source: FAO 2010.

Although agriculture is a major factor in deforestation in Latin America, the main explanation for this trend is the use of land for cattle grazing. Livestock production in areas surrounding forests has a greater impact on deforestation than forest communities or communities within their immediate vicinity (Costenbader 2011). Generally, these communities are negatively affected by this problem because forests are a key component in their livelihoods, particularly in regards to their food security. The loss of tropical forest and biodiversity, in particular of fauna, has a direct impact on the inhabitants of the forest, since they are the most dependent on the ecosystem's services. In the case of the inhabitants of the Amazonian forests, more than 50% of their protein comes from hunting wild animals (Robinson et al. 1999).

Meanwhile, the degradation of forests continues to affect their composition, genetic diversity and production capacity. Illegal logging, collection of firewood for sale, overgrazing in wooded areas, and slash-and-burn agriculture are some of the causes of this degradation. This damage to the forest resource is difficult to assess and monitor. Through projects designed to reduce emissions from deforestation and REDD+, many countries in the region have made efforts to identify the causes of deforestation and forest degradation, and assess their impact on opportunities for development in rural areas.

Climate change mainly affects vulnerable populations and family farmers

The IPCC (2007b) forecasts that rainfall and temperature levels will vary considerably in both Latin America and the Caribbean in the wake of the changes wrought by global warming. The possible effects are varied, due to the scarcity of water year-round, the spread of pests and diseases, and the proliferation of invasive species that can negatively impact natural ecosystems and, especially, family farming systems (COPROFAM and PROCISUR 2011). For example, the region has seen an increase in extreme weather events such as

hurricanes and tornados, which cause great destruction and particularly affect smallholders, since generally they do not have insurance or financial resources to restore their productive capacity (IPCC 2007b).

According to ECLAC-GTZ (2009), the cost of the damage caused by hydro-meteorological phenomena in the last 40 years in the region has reached USD 80 billion. If appropriate measures are not taken for climate change mitigation and the adaptation of farming, the resources on which farming is based could suffer irreversible damage (IAASTD 2009).

Forests are closely linked to climate change. On the one hand, they play a fundamental role in the capture and storage of carbon that help to mitigate its effects but, on the other, they are an important source of emissions. About 20% of greenhouse gas (GHG) emissions are generated by deforestation and degradation of forests (UN-REDD 2013). Therefore, the loss of forests directly affects family farmers and denies them development opportunities due to the loss of goods and services, as well as the resulting increase in climate variability that significantly alters their productive activities.

Natural forest ecosystems are more resilient to climate variability than plantation forests and these, in turn, are more resilient than agricultural crops. This situation has spurred the development of legislation and programs designed to promote the conservation of natural forests, the recovery of degraded areas with forest plantations or management of natural forest regeneration, and the implementation of agricultural adaptation measures in order to improve the response capacity of the most vulnerable farmers. Some countries, such as Chile, Guatemala and Uruguay, have already begun to design and implement climate change adaptation programs, with special emphasis on promoting integrated agricultural systems for small and medium-sized producers (TGM 2013 and ODEPA 2013).

The services that forests provide are being valorized and can generate significant benefits for rural communities

In general, the multiple benefits generated by forests are considered public goods and, therefore, they are not assigned a monetary value. However, in the 1990s the potential use of forests to provide environmental services emerged as a possible source of income for farmers in rural communities, and different techniques were developed to determine the value of such services. Since then, a number of countries, led by Costa Rica, have begun to valorize the environmental services provided by forests and design legal mechanisms so that forest owners can benefit.

According to TEEB (2010), forests and other ecosystems account for between 47% and 89% of the livelihoods of rural populations through ecosystem services and other direct benefits. This shows the importance of conservation for poverty reduction.

Currently, carbon sequestration by natural and planted forests is a great opportunity for small-scale farmers and forest communities, especially indigenous communities. The REDD+ initiative, which emerged in 2007 under the auspices of the United Nations Framework Convention on Climate Change (UNFCCC), offers an important opportunity since many developed countries are willing to pay for the reduction of emissions caused by deforestation and forest degradation.

If the annual rate of global deforestation were halved by 2030, annual greenhouse gas emissions would be reduced by between 1.5 and 2.7 Gt of CO2, which would avoid damages caused by climate change worth a net present-day value of USD 3.7 billion. This figure does not include co-benefits generated by forest ecosystems (TEEB 2010).

In Latin America there are already important initiatives financed by developed countries. Brazil, Guyana, Mexico and Peru are implementing pilot projects, while other countries are preparing to take advantage of the services generated by their forests. While it is true that the current focus is on carbon sequestration, the potential of other services generated by forests, including biodiversity conservation, water production, soil conservation, and the reduction of risks associated with landslides and erosion, should not be ignored.

Important efforts have been made in the region to valorize these services, so that local communities committed to the care of forests are properly compensated. Payments for water production are becoming a reality. Some countries have already created legislation in this regard, such as Costa Rica where power companies offer compensation to maintain or restore forests in river basins that supply them with water. Similarly, for more than a decade several municipalities in Ecuador have ensured enough water for human consumption through payment to communities in the river basins that supply them (Lamb 2008). Similar examples are to be found in Mexico, Honduras, Guatemala and Bolivia. The tourism potential of certain areas has also been valorized, which has helped to generate resources for communities.

Resolving problems of land and forest ownership is a priority for governments

The failure to afford farmers security by formalizing land and forest ownership is one of the most important obstacles to the development of family farming. This is a particular problem for the development of forestry activities, both forest management and plantations, since they are long-term undertakings with multi-year production cycles. The lack of formal property titles prevents small landowners from obtaining loans or benefits established in forest development and native forest management laws designed by governments to promote the development of family farming. In Chile, for example, forestry promotion laws favor individuals or communities that have legally acquired ownership of the land (Cabaña 2011). In addition, the lack of legal ownership is a disincentive to long-term planning with a vision of sustainability.

This is a common denominator in most of the countries of the region, since about 50% of farmers do not hold ownership of the land they work (ECLAC et al. 2012). Indigenous peoples not only lack title; in many cases, their lands have not been demarcated. In Brazil, only 37% of the indigenous territory had been demarcated in 2003 (Herrera 2005), and little progress has been made since then. A bill for the allocation of indigenous lands is currently (2013) being debated in Congress[1].

Many countries in the region have taken action to register land titles, both of individuals and communities. In the last 15 years, with loans from the World Bank and the Inter-American Development Bank (IDB), over 50 projects aimed at formalizing land ownership and modernizing rural land registration systems have been implemented in the region. This task, which is still pending in many countries of the region, mainly affects the development of forestry activities on small properties.

1. More information available at http://www1.folha.uol.com.br/poder/2013/04/1263519-indios-dizem-que-so-saem-da-camara-se-pec-sobre-demarcacoes-for-extinta.shtml

Prospects

Planting and managing forests can strengthen family farming

Many countries in the region have implemented policies aimed at promoting forest management and conservation, as well as the establishment of plantations in suitable areas devoid of vegetation in order to diversify production on small farms. In addition, they have promoted the development of institutional services suited to the needs and characteristics of family farming, including technical and financial assistance to encourage forestation, agroforestry and forest management by smallholders and rural and indigenous communities.

In 2012, Panama began implementing a plan for the conservation and sustainable management of 440,000 hectares of forest in indigenous communities in the province of Darien. The goal was to reduce illegal logging by 75% within a period of approximately five years and to strengthen community-based forest enterprises that would improve the quality of life of the indigenous population.

In Chile, small forest owners may apply either individually or collectively to a fund established under Law 20283 of 2008 to execute forest management plans or to establish plantations in degraded areas. In addition, the Chilean Congress is discussing another amendment to Law 701, previously amended in 1989. The main objective of the amendment is to help small landowners to establish forest plantations on land suitable for productive purposes or conservation. For the first time, this would include incentives for plantations with purely environmental purposes, such as the recovery of degraded soils and carbon sequestration.

In Bolivia, with support from IICA, a five-year program was launched in 2010 to strengthen the national system of innovation in farming and forestry. One of its goals is to provide technical assistance aimed especially at small and medium-sized farms.

In the medium term, the establishment of forest plantations and forest management systems are important activities to strengthen family farming.

REDD+ programs could generate important benefits for rural communities

Twenty-three countries[2] in the region are developing REDD+ programs related to emissions reductions, through the UN-REDD programs of the United Nations, the Forest Carbon Partnership Facility (FCPF) and the World Bank's Forest Investment Program (FIP). Countries are strengthening national systems of valorization, reporting and verification of forest carbon stocks, in order to eventually issue emissions reduction certificates, to be traded via the mechanisms established by the UNFCCC. Most of the resources generated by the marketing of these certificates are expected to benefit communities that live off the forests and promote conservation, thereby reducing CO2 emissions.

The conservation of forests should generate other social and environmental benefits besides emissions reduction certificates. For these benefits to be effective, it is important that the State or other organizations lend support to the process of marketing the certificates. It is difficult for small landholders to obtain such benefits individually. However, in the Chocó-

2. Argentina, Bolivia, Brasil, Chile, Colombia, Costa Rica, Dominica, Ecuador, El Salvador, Guatemala, Grenada, Guyana, Haití, Honduras, Jamaica, México, Nicaragua, Panamá, Paraguay, Perú, Santa Lucía, San Vicente y las Granadinas, Surinam.

Box 7. Small landowners in Petén create a pioneering forestry company

Nearly 87% of the population of Petén Department in Guatemala faces some degree of food insecurity and 34% of school-age children suffer some kind of growth retardation due to problems of chronic malnutrition.

Petén's main resource is its forests, but the distance to markets, as well as the lack of technical capacity and management expertise, has prevented the community from receiving the economic, social and environmental benefits that their forests could provide.

In April 2011, the Fund for National Forest Programs (NFP), in conjunction with the Growing Forest Partnership in Guatemala, initiated a project with six communities in Petén, including owners of 1084 hectares of forest plantations. As a result of this project, these communities created a company called Red Forestando Chachaklum S.A., which has helped change the way they manage their resources and, most importantly, the way they negotiate prices for their products. These communities now contact purchasing companies directly and thus avoid intermediaries that historically fixed prices and obtained the higher profits in this business.

Under the program, the communities have not only been trained to negotiate directly with buyers, but also to manage their forests better, thereby enabling them to sell more products and reach new markets. These changes have substantially increased incomes and job opportunities in Petén. Because these communities joined forces to create a single organization, they have more bargaining power and have created new job opportunities for their members in activities such as pruning, logging and transport.

In 2014, new forest plantations will enter into production and the volume of wood available is expected to double (FAO 2012).

Darién area of Colombia, several communities that depend on forests are generating revenue from the sale of carbon credits while preserving their traditional ways of life (Butler 2013).

Even though the UNFCCC is still studying the REDD+ mechanism, donor countries have already contributed significant financial resources for the implementation of these programs. In the region, there is the Amazon Fund, a Brazilian fund supported by Norway and Germany, whose goal is to reduce the loss of the Amazonian rainforest through various initiatives, from research to support for local communities interested in the conservation of their forests.

In March 2013, Chile registered the first Nationally Appropriate Mitigation Action (NAMA)[3] for forests with the UNFCCC. That project, which has international support, aims to generate additional revenue for small forest owners by marketing carbon credits through a platform for the generation and sale of carbon credits by Chile's forest sector (PBCCh). This is a good example of how the services provided by forests, in this case carbon sequestration, can benefit rural landowners and indigenous communities.

Forests will play an increasingly important role in generating income and creating livelihoods in rural farming communities

Regional policies to encourage new settlements and the expansion of the agricultural frontier have promoted deforestation through mechanisms that require farmers to clear the land as a condition for granting ownership.

3. These are actions taken by developing countries as part of a commitment to reducing greenhouse gas emissions.

The region is losing nearly four million hectares of forests per year as a result, which reflects the lack of vision about their potential for economic and social development, and their environmental significance. However, there has been a positive change in society's perception of the role played by forests in climate change mitigation, in the regulation of the hydrological cycle and in the food security of communities living in or near forests. In view of this development, policies should be adjusted gradually in order to respond to the new circumstances.

In rural areas, forests and the trees that normally grow on farms are essential for the subsistence of rural families, since they supply the inputs for agricultural and livestock activities, such as the building of fences, corrals and sheds, as well as food for people and animals. Although there is no data on the economic importance of forests for the rural family economy, it is known that the sale of wood, fruits and other forest products constitutes a significant source of income for small-scale farmers in the region. As noted above, this activity may account for more than 80% of the livelihoods of some rural residents.

In addition, forests are the main source of energy in the rural communities of LAC. According to FAO (2011), 81.3% of the wood consumed in Central America goes to the production of firewood, while in South America it is approximately 50%.

Furthermore, vegetation in dry lands and mountainous areas provides rural communities with wood for fuel and construction, as well as being an important source of food for livestock.

In summary, forest management, the extraction of non-timber forest products and the sustainable use of forest resources should be fostered and properly funded to help strengthen the productive activities of small-scale farmers.

Policy recommendations

Controlling deforestation should be a priority within the framework of public policies to promote the development of family farming

Deforestation reduces rural development opportunities, since it deprives people of livelihoods, as well as energy sources and environmental services. In addition, its effect on the climate has serious consequences for the productive activities of small-scale farmers. Therefore, efforts to promote the development of family farming should consider the need for policies designed to control deforestation.

In this regard, national emissions reductions efforts, such as REDD+, can generate important benefits for forest-dependent communities in the medium and long terms. To achieve that goal, together with the development of REDD+ initiatives, public policies should be developed to ensure that communities that use forests or are located inside them benefit directly from reductions in emissions that cause deforestation and forest degradation. Such policies should integrate small landowners and indigenous communities into the design and implementation of programs, through mechanisms that ensure that the benefits generated are distributed fairly.

Specific public policies should be developed, strengthened and implemented that promote activities designed to foster the conservation and sustainable management of forests, afforestation and agroforestry among family farmers. This calls for specific incentives for forest management and reforestation, adequate training and technology transfer programs, and the strengthening of farmers' organizations.

Box 8. Association of Agroforestry Producers in Cotuí, Dominican Republic

The Association of Agro-Forestry Producers in the municipality of Cotuí, in the Dominican Republic, is an example of how communities can use technical and administrative tools to develop agroforestry systems, improve their food security, and recover soil quality and the landscape.

This municipality has about 1700 farms with less than one hectare of land each. Historically, the land was cleared and used intensively with no thought for conservation, which resulted in the deterioration of the soil and low productivity. In 1982, ENDA-Caribe[4] began to support these communities, promoting the cultivation and use of more than 160 species of medicinal plants, fruits and trees, in conjunction with traditional agricultural crops.

The project focused on the production of fodder, firewood and timber from forests and agricultural crops, and also included beekeeping. It established community nurseries through volunteer work. Local materials were used, which produced plantations with multiple uses including the sale of wood for furniture and firewood.

In 1992, the Agroforestry Producers Association (APA), with more than 600 members, opted to replace peanut and tobacco monoculture with integrated agro-forestry systems. That same year the first community sawmill was established, supplied entirely with wood from plantations. After seeing that timber production was a reality, the members intensified forestry activities and created teams to provide training in all aspects related to the management of forests, from the nursery to the harvest.

Despite having been strongly affected by Hurricane George in 1998, the Association was able to recover and move towards self-management. The support of ENDA-Caribe decreased gradually as the project was consolidated. The sawmill was expanded with the addition of dryers and a carpentry workshop, resulting in permanent jobs for many members of the community.

The quality of life in the community has improved, thanks to the inclusion of trees in its traditional farming system (Carrera 2010).

Climate change adaptation in family farming should be promoted through forestry activities

Climate change may severely affect the conditions in which family farming takes place. This means that countries should incorporate this sector of the rural population into climate change adaptation plans for the agroforestry sector. Adaptation measures should include an integral approach to land management, as well as aspects related to water use in agriculture, studies of new plant and animal varieties, plant breeding, the review of planting dates, early warning mechanisms to reduce the risk of extreme weather events, and training programs to involve family farmers in these processes of change.

In addition to the specific adaptation practices that need to be developed and incorporated into agriculture, forestry activities can improve the resilience of family farmers to climate change.

4. Environment and Development Action (ENDA) is a non-governmental organization (NGO).

Farms with diversified productive activities, including conservation and management of natural forests and plantations, semi-perennial crops, annual agricultural crops and livestock activities in silvopastoral systems, can substantially improve the capacity of small farmers to adapt to the new conditions caused by climate change.

Governments should move ahead with the valorization of environmental services from forests and the development of the conditions for the payment of such services

The environmental services generated by forests are being recognized in several countries of the region. This trend could generate new sources of revenue for their owners, which would encourage conservation and management. To that end, it is essential that countries move forward with their efforts to valorize such services and develop the legislation required to regulate payments for environmental services, particularly the communities that live in direct contact with forests.

In addition, public policies should be designed to promote economic incentives for rural populations that conserve and properly manage forests through the environmental services they provide. This could generate a significant flow of resources towards the rural environment and more equitable development, which would also improve the quality of life of farmers and rural communities.

When the community recognizes and pays for environmental services, it becomes more aware of its environment and the importance of the proper use of natural resources.

Formalizing land ownership to promote forest management and other forestry activities by family farmers

Countries should strive to solve problems relating to land titles and the allocation of land. The registration of titles of small landholders and indigenous communities is a critical step for economic development, and particularly for the development of forestry activities. Given the long-term vision required by forestry activities, resolving the issue of land ownership is important.

However, this issue should be linked with strategies and mechanisms that facilitate the development of communities and the integrated management of their land, since simply giving out titles does not necessarily consolidate ownership and promote the proper use of natural resources.

Conclusions

The loss of forests directly affects family farmers. On the one hand, it limits their development options and, on the other, it produces climate variations that weaken their agricultural productive activities. The last decade has been characterized by strong climatic phenomena, with devastating effects on agriculture and especially for small and medium-sized farmers, who do not have the means to restore their productive capacity.

The control of deforestation and forest degradation must be considered in regional policies, not only because LAC has the highest rate of loss of forest cover worldwide, which seriously affects the livelihoods of rural dwellers, but also because of its importance in the mitigation of climate change at the global level.

Countries in the region are actively participating in the REDD+ emissions reduction programs. However, it is essential to design mechanisms to ensure that the benefits generated through these programs reach rural communities and small-scale farmers.

In addition to carbon sequestration, forests produce a number of benefits, such as biodiversity conservation, regulation of the hydrological cycle and soil protection, among others, which may constitute an additional source of income for family farmers who manage forests in a sustainable way. It is important for countries to design legal mechanisms to facilitate payment for the environmental services provided by forests.

Climate variability, reflected in the increase of extreme weather events, has a severe impact on family farmers, since they do not have the means to recover their productive capacity. To reduce this impact, it is important for countries to develop adaptation programs involving family farming. New adaptation practices should focus on the diversification of production, including agroforestry and silvopastoral systems, sustainable forest management, and forest plantations, among other initiatives. Through these actions, small-scale farmers can become more resilient to climate change.

Finally, in order to encourage better forest management, prevent forest degradation and promote plantations and agroforestry systems, programs and policies should be developed to formalize land ownership, mainly for smallholders, who are affected most by the lack of legal ownership of rural land in the region.

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Chapter 3: Rural Well-being

Rural Well-being

Family agriculture:

A reading from household surveys

Facts

- Poverty incidence, and especially extreme poverty, continue to be higher in rural areas, and the gaps have not closed significantly in the last decade (ECLAC et al. 2012).
- In the majority of countries, there was an increase in the proportion of rural employment in non-agricultural sectors, reflecting changes in the productive structure of rural economies (ECLAC et al. 2012).
- One of the most significant changes in the rural job market is the increased relative importance of salaried employment (ECLAC et al. 2010).
- Rural poverty incidence is higher among households that depend on agricultural income and transfer-dependent households (ECLAC et al. 2010).
- A growing share of agricultural employment corresponds to people living in urban areas (ECLAC et al. 2012).

Introduction

According to ECLAC (2012), structural change is a process of transformation characterized by four elements: a) diversification of the productive structure; b) more linkages among production sectors; c) greater relative importance of knowledge-intensive activities; and d) integration into rapidly growing international markets.

This chapter analyzes how family agriculture has been affected in the last decade by the process of structural change in rural economies. To that end, structural change –referring only to the first element above– is defined as the transition from an agriculture-dominated rural economy, especially traditional, low-productivity agriculture, to a more diversified rural economy with more value added activities (which may or may not be linked to agriculture) and a growing share of non-agricultural production. Although limited, this approach to structural change makes it possible to adopt a job-market approximation that focuses on reducing poverty, since it is assumed that diversification of the production structure contributes to creating more productive, better quality, and better paid jobs.

The analysis is based on a household typology designed to identify changes in sectoral employment patterns, based on information from household surveys. The typology identifies the following eight types of households, indicative of productive orientation: a*) agricultural salary households; b) non-agricultural salary households; c) diversified*

salary households; d) employer households; e) self-employed non-agricultural households; f) 100% family agriculture households; g) diversified family agriculture households; and h) inactive households. The categories are mutually exclusive, and are the result of a combination of information on the occupational status of head of households and other employed household members, as can be seen in Table A.1 (Annex).

The following methodological considerations are relevant as criteria for determining the scope and limitations of the typology. First, the unit of analysis is households, not farms; second, the concept of family agriculture is associated with the occupational status of agricultural self-employed members of the household; third, the concept of diversified family agriculture households refers to employment of some household member in a sector other than agriculture; and fourth, the category of employer households includes both agricultural and non-agricultural employers.

Given these methodological comments and based on the premise that a change in sector employment patterns is a manifestation of structural change, the proposed approach holds that: a) households are a relevant economic unit in which employment decisions are made; b) the employment structure of a household is representative of its productive orientation (thus, changes in household employment structure make it possible to identify structural change in the economies in which these households operate); and c) the employment information of self-employed household members working in agriculture makes it possible to identify households involved with family agriculture. The analysis is based on information from household surveys conducted in twelve Latin American and Caribbean (LAC) countries, for the periods "around 2000" and "around 2010." [1]

The chapter highlights three challenges faced by family agriculture, the public policy implications of which are discussed in the last section: a) **a viability challenge**, associated with structural change in the rural economy; b) **a capacity challenge**, associated with low educational level among heads of family agriculture households; and c) **a generational challenge**, associated with the older age of heads of family agriculture households, compared with the heads in other household groups.

Trends

Poverty incidence has fallen among all household groups, but continues to be highest among 100% family agriculture households.

In the last decade, poverty incidence fell among practially all rural household groups, and in all the countries. In particular, poverty declined the most in *agricultural salary households* and *100% family agriculture households* in the majority of the countries. The greatest reductions in poverty incidence among *100% family agriculture households* occurred in Colombia (22.2%), Bolivia (17.6%), the Domican Republic (16.1%), Costa Rica (15.8%) and Chile (15.5%). The smallest reductions occurred in El Salvador (8.1%), Honduras (7.9%), Mexico (4.2%) and Paraguay (3.9%) (Table 13 in the Annex).

A consideration of poverty incidence among all rural households identifies three groups of countries. The poorest group includes Honduras (71.1%), Nicaragua (53.2%),

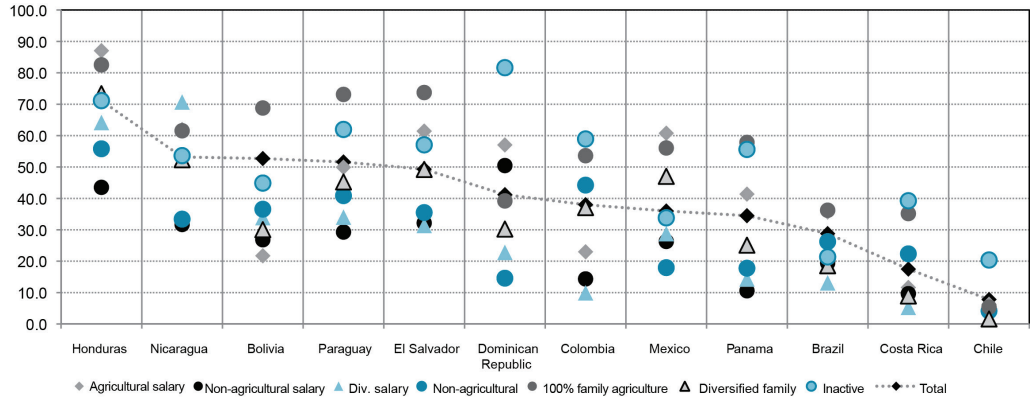
1. Information by country and survey year: Bolivia (2002 and 2009), Brazil (2001 and 2011), Chile (2000 and 2011), Colombia (2002 and 2011), Costa Rica (2002 and 2011), Dominican Republic (2002 and 2011), El Salvador (2001 and 2010), Honduras (2002 and 2010), Mexico (2000 and 2010), Nicaragua (2001 and 2009), Panama (2002 and 2011), and Paraguay (2002 and 2011).

Bolivia (52.7%), Paraguay (51.5%) and El Salvador (49.3%). In all those countries, poverty incidence among *100% family agriculture households* exceeds 60%. At the opposite extreme, with poverty rates in rural households below 20%, are Costa Rica (17.5%) and Chile (7.8%). The remaining countries are in the intermediate range (Figure 12).

100% family agriculture households, agricultural salary households, and *inactive households* have the *highest poverty incidence*. Around 2010, *100% family agriculture households* were among the two poorest rural groups in nine of the twelve countries studied; the exceptions were Chile and the Dominican Republic (*inactive households* and *agricultural salary households*) and Nicaragua (*diversified salary households* and *agricultural salary households). Inactive households* were among the two poorest groups in seven countries (Bolivia, Chile, Colombia, Costa Rica, Dominican Republic, Panama, Paraguay). *Agricultural salary households* were among the two poorest groups, also in seven countries (Brazil, Chile, Dominican Republic, El Salvador, Honduras, Mexico, and Nicaragua). When *inactive households* are excluded***, 100% family agriculture households*** are among the two poorest groups, except in the Dominican Republic and Nicaragua (Figure 12).

In contrast, the household groups with the *lowest poverty levels* (excluding *employer households*) are *non-agricultural salary households, diversified salary households,* and *diversified family agriculture households.* Around 2010, at least one of these household groups was among the two least poor in all the countries. *Non-agricultural salary households* were among the two least-poor rural household groups in Bolivia, Colombia, El Salvador, Honduras, Mexico, Nicaragua, Panama and Paraguay. *Diversified salary households* were among the two least-poor household groups in Brazil, Chile, Colombia, Costa Rica, El Salvador, Panama and Paraguay. *Diversified family agriculture households* were the least-poor households in Brazil, Chile and Costa Rica, the three countries with the lowest poverty levels.

Figure 12. Latin America (12 countries): Poverty incidence among rural households, around 2010 (percentages of total households in each category).



Source: Agricultural Development Unit, ECLAC
The countries are organized in descending order, by poverty incidence among total rural households.

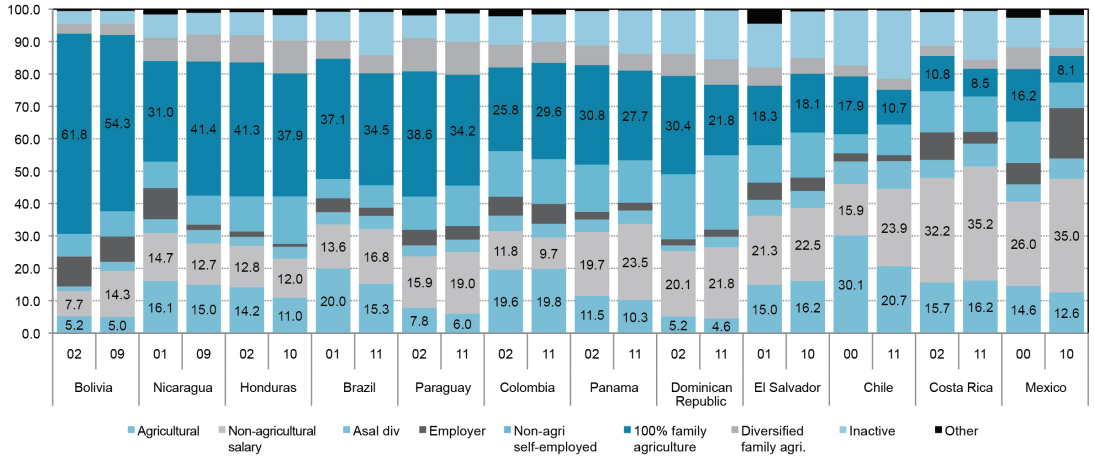
It is worth noting that *diversified salary households* and *diversified family agriculture households* are the two least-poor groups in eight of the twelves countries (Brazil, Chile, Colombia, Costa Rica, Dominican Republic, El Salvador, Panama and Paraguay); and in Brazil, Chile, and Costa Rica, the three countries with the lowest poverty incidence among total rural households, they are the least-poor groups (Figure 13). It is also important to note that *diversified salary households* are the least-poor group in five countries (Brazil, Chile, El Salvador, Panama and Paraguay). These two factors show the importance of diversification as a poverty-reducing strategy.

Furthermore, five of the seven countries with a majority of *100% family agriculture households* are among the poorest countries with the greatest poverty in this household group (Bolivia, Honduras, Nicaragua, and Paraguay). Brazil is the most notable exception among countries with a high percentage of *100% family agriculture households* (34.5%) due to the low level of poverty in that household group (36.2%), the third lowest after Chile and Costa Rica (Figures 1 and 2). El Salvador is the exception among countries with a low percentage of *100% family agriculture households* (18.1%), due to the high poverty incidence in that group (73.7%), the second highest after Honduras.

Although the relative weight of rural households linked to family agriculture is falling, in a significant number of countries it continues to be the largest group.

The most common pattern of change in household distribution in the last decade was the decline in the relative importance of *100% family agriculture households* relative to the growth in the percentage of *non-agricultural salary households*. This pattern occurred in nine of the twelve countries studied (Bolivia, Brazil, Chile, Costa Rica, Dominican Republic,

Figure 13. Latin America (12 countries): Relative distribution of rural households, by household type (percentages, around 2000 and 2010).



Source: Agricultural Development Unit, ECLAC

Mexico, Honduras, Panama and Paraguay). The percentage of *100% family agriculture households* rose only in Colombia and Nicaragua, while no definite pattern was noted in El Salvador (Figure 13). The share of *diversified salary households* also rose, except in Colombia and Nicaragua. The pattern in the last three cases is relevant because they are countries that, during the 1990s, experienced internal conflicts whose impacts were experienced especially in their rural areas.

The distribution of rural households according to the proposed typology makes it possible to identify two groups of countries. The first is countries where, around 2010, the largest group continued to be *100% family agriculture households,* despite the changes noted*;* this group includes seven of the twelve countries analyzed: Bolivia, Brazil, Colombia, Honduras, Nicaragua, Panama and Paraguay. The highest percentages of *diversified agricultural households* was also found in some of these countries, exceeding 5% in Brazil, Colombia, Honduras, Nicaragua, Panama and Paraguay. In the second group, the predominant category is *non-agricultural salary households* and includes Chile, Costa Rica, El Salvador and Mexico. The Dominican Republic has three household groups of similar relative importance (*non-agricultural salary households, non-agricultural self-employment households* and *100% family agriculture households*). The lowest percentages of *100% family agriculture households* occurs in Chile (10.7%), Costa Rica (8.6%) and Mexico (8.1%) (Figure 13 and Table 12 in the Annex).

The percentage of female heads of households in family agriculture is low but rose in the past decade and is stronger in urban areas.

The figures for female heads of *100% family agriculture household* are generally low and around 2010 did not exceed 20% in any given country, lower than the average for all rural household groups. The highest percentages occurred in Chile (19.6%), Bolivia (16.8%) and Brazil (16%); the lowest in Mexico (10.3%), Paraguay (10.8%), Costa Rica (11.2%) and Nicaragua (12.0%) (Table 14 in Annex).

However, when considering family agriculture households, in both rural and urban areas, two points of interest emerge. First, in all the countries the percentage of female heads of *100% family agriculture households* in urban areas is considerably higher than in rural areas, in all cases exceeding 30% and in some cases exceeding 40% (Brazil, Chile, Panama) (Figure 14, left panel, rhomboids connected by dotted lines). The same occurs among *diversified family agriculture households* in seven countries (Brazil, Chile, Colombia, Dominican Republic, El Salvador, Panama and Paraguay), although there the differences are less significant (Figure 14, left panel, squares connected by dotted lines). Second, in urban areas of all the countries, the percentage of female heads of *100% family agriculture households* is higher than among *diversified family agriculture households* (vertical comparison of rhomboids and squares); however, in rural areas this is the case in only five countries (Brazil, Chile, Dominican Republic, Mexico and Panama).

In short, findings show that the percentage of female heads of family agriculture households is higher in urban areas than in rural areas in all the countries, regardless of rural poverty incidence among total households or family agriculture households.

Moreover, and in line with earlier reports (ECLAC *et al.* 2011 and 2012), the rates of female heads in both groups of rural *family agriculture households* (except Mexico) have risen, following the same trend as among total rural households (Figure 15, right panel).

Finally, when all household groups are taken into consideration, the most significant finding is the high percentage of female heads of *inactive households.* Around 2010, the percentage of female heads of *inactive rural households* was between 40% and 50%: in Chile (43.6%),

Brazil (45.5%) and Costa Rica (45.7%); and equal to or higher than 60%: in Paraguay (60%), Bolivia (61.2%), El Salvador (61.3%), Nicaragua (62.2%) and Honduras (72.7%). In this case, evidence points to an association with poverty incidence since the percentage of female heads is lower in the three countries with the lowest poverty incidence and highest in the poorest countries (Tables 12 and 14 in the Annex).

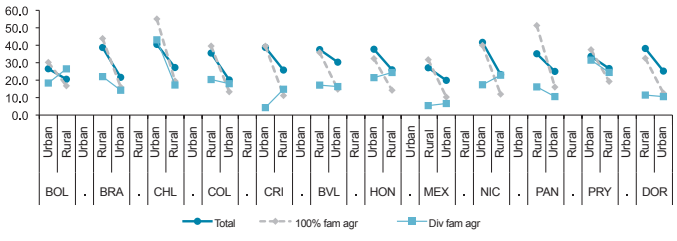
The heads of family agriculture households have the highest average age, which poses a generational challenge.

A clear pattern exists with regard to the age of heads of rural households. In most cases, *non-agricultural salary households* have the lowest average age of heads (Bolivia, Chile, Costa Rica, Dominican Republic, El Salvador, Honduras, Mexico, Nicaragua and Panama), while the highest average ages (excluding *inactive households*) occur among *100% family agriculture households* (Bolivia, Brazil, Chile, Colombia, Costa Rica and Paraguay) and *diversified family agriculture households* (Dominican Republic, El Salvador, Honduras, Mexico, Nicaragua and Panama) (Figure 15, left panel and Table 15 in the Annex).

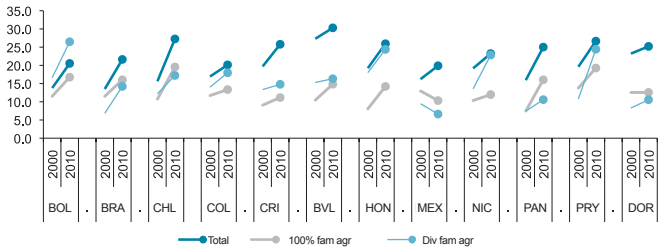
Therefore, in general, within the countries, the lowest poverty households (*non-agricultural salary households*) have, on average, the youngest heads, while the heads of the poorest groups (those linked to agriculture) have the highest average ages. Moreover, the average age of heads of *100% family agriculture households* rose in the last decade and the gap between that group and the heads of *non-agricultural salary households* also widened or remained constant, except in Mexico and Panama (Figure 15, right panel). Both these dynamics occur equally among total rural households in high and low poverty countries (Tables 12 and 15 in the Annex).

Figure 14. Latin America (12 countries): Female heads of household among selected groups (percentage of total households in each category)

Female heads of household among selected groups, by rural and urban area, 2010



Female heads of household among selected rural household groups, 2000-2010



Source: Agricultural Development Unit, ECLAC.

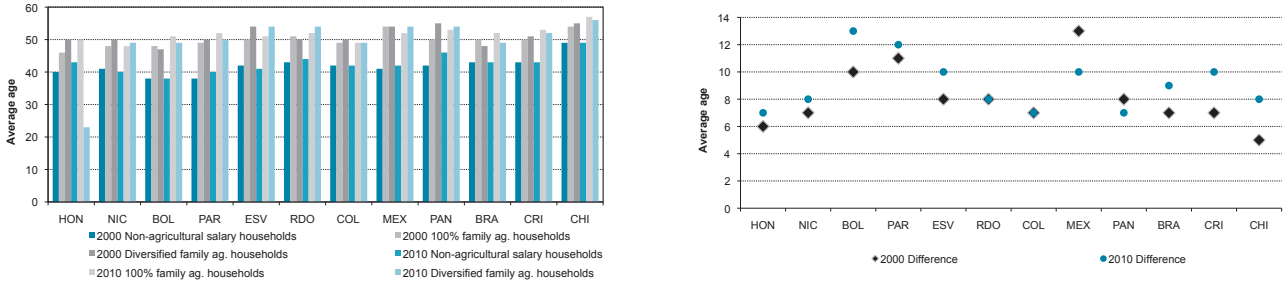
The average age of heads of rural households linked to family agriculture at the end of the period under study was 52-53 years; the lowest values occurred in Colombia and Nicaragua (less than 50 years), and the highest in Chile (57 years). The differences with the average age of total rural heads are not considerable, and in the majority of the countries range between 2 and 3 years, except Honduras (1 year) and Costa Rica (6 years). The differences, however, are much more significant with heads of non-agricultural salary households, the group with the lowest poverty level in the majority of the countries. In this case, the differences range between 8 and 10 years, with the smallest gaps occurring in Colombia and Honduras (7 years), and the highest in Bolivia and Paraguay (12 to 13 years). In this case as well, variability is keyed to poverty level among total rural households.

Heads of family agriculture households have lower educational levels, which poses a challenge in terms of capabilities.

Differences in the educational levels of heads of the different household groups are even more marked than age differences. The lowest average educational level occurs among *100% family agriculture households* in all countries, except Nicaragua (agricultural salary workers). At the other extreme are *employer households* and *non-agricultural salary households,* the two groups with the highest educational levels in all countries and the lowest poverty levels. The heads of *non-agricultural salary households* have the highest educational levels in nine of the 12 countries (Bolivia, Brazil, Colombia, Dominican Republic, El Salvador, Honduras, Mexico, Nicaragua and Paraguay) (Table 16 in the Annex and Figure 16, left panel).

Although the average educational level of households linked to family agriculture rose in the last decade, in general the gains were equal to or lower than those of other groups, which means that the gaps remained unchanged or even widened. The gap between the *100% family agriculture households and non-agricultural salary households* groups was only bridged in Honduras; in the remaining countries it grew (Bolivia, Panama, Brazil, Chile) or remained the same (Nicaragua, Paraguay, El Salvador, Dominican Republic, Colombia, Mexico, and Costa Rica) (Figure 16 right panel).

Figure 15. Latin America (12 countries): Average age of heads of households linked to family agriculture and heads of *non-agricultural salary households* (left panel), and difference between the average age of heads of *100% agricultural households and non-agricultural salary households* (right panel), around 2000 and 2010 (percentages).

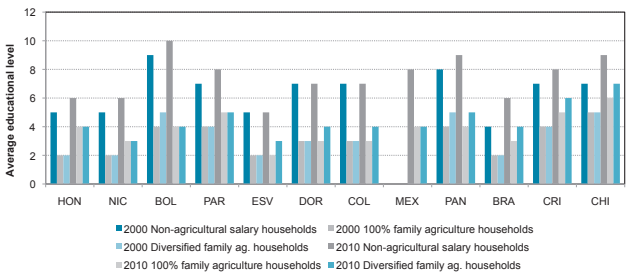


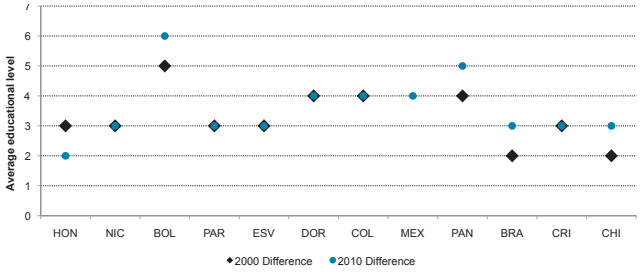
Source: Agricultural Development Unit, ECLAC.

Excluding heads of employer households, around 2010 the differences in average educational level among heads of *non-agricultural salary households* and heads of *100% family agriculture households* was between two and three years in Honduras, Brazil, Chile, Costa Rica, El Salvador, Nicaragua, and Paraguay, and between five and six years in Panama and Bolivia. With the exception of Chile, in all the remaining countries the heads of *100% family agriculture households* have an average of less than six years of schooling, and in some cases the average does not exceed three years (Brazil, Colombia, Dominican Republic, El Salvador, and Nicaragua). On the other hand, the average educational level of heads of *non-agricultural salary households* exceeds six years in all the countries (Figure 16).

The relationship between the educational level of heads of households related to family agriculture and poverty rates is more direct than in the case of age. For example, the highest educational levels among the two groups of *family agriculture households* occur in Chile and Costa Rica, countries with the lowest poverty among total *rural households* and *non-agricultural salary households*. It is also noteworthy that the average educational level of heads of *diversified family agriculture households i*n all the countries is equal to or higher than that of *family agriculture households* (Figure 17, left panel).

Figure 16. Latin America (12 countries): Averge educational level of heads of households linked to family agriculture and heads of n*on-agricultural salary households* (left panel), and difference between average educational level of heads of *100% agriculture households and non-agricultural salary households* (right panel), around 2000 and 2010 (average years of schooling).





Source: Agricultural Development Unit, ECLAC.

Low educational levels and higher age of heads of households: a disadvantageous combination for family agriculture households.

The information summarized in Figures 17 and 18 shows the relationship between the educational level and age of heads of households and poverty levels in the different household groups.

In the majority of cases, the average age of heads of *family agriculture households* is over 50 years and average schooling is less than six years; at the other extreme, the average age of heads of *non-agricultural salary households* in general is under 45 years and average schooling is more than six years. The low educational level of heads of households linked to agriculture is also evident in the case of *agricultural salary households;* in spite of an average age of less than 45 years, in general they also have less than six years of schooling (Figure 17).

A more detailed analysis within the different countries indicates that there is also a relationship between poverty incidence and the educational level of the heads of different household groups (Figure 17). With few exceptions, poverty incidence among households whose heads have less than four years of schooling is more than 30%. In general, poverty incidence does not exceed that percentage when heads have more than six years of schooling, which, in most cases, represents a complete primary education (Figure 18).

The relationship between age and education tends to vary depending on the poverty level of the countries. For example, in countries with higher poverty incidence (red), the poverty rates of households whose heads have less than six years of schooling tend to exceed 40%, while in the least-poor countries (green), six years or more of schooling is associated with less than 20% poverty.

Figure 17. Latin America (12 countries): Relationship between educational level and age of heads of rural households, by type of household and country (average years).

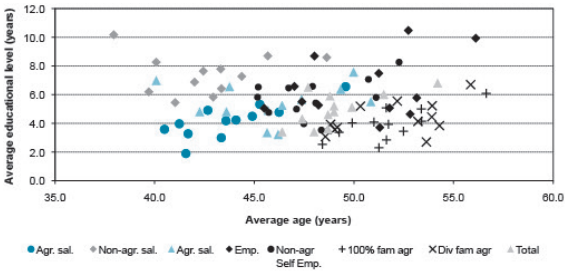
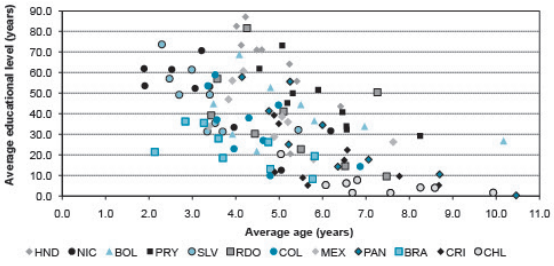


Figure18. Latin America (12 countries): Relationship between educational level of heads and poverty incidence among rural households, by country (average years and percentages)



Source: Agricultural Development Unit, ECLAC.
Agr sal = agricultural salary; Non-agr sal = non-agricultural salary; Div sal = diversified salary; Emp = employers; Non-agr Self Emp. = non-agricultural self-employed; 100% fam agr = 100% familiy agriculture; Div fam agr = Diversified family agriculture; Inact = inactive.
BOL = Bolivia; BRA = Brazil; CHL = Chile; COL = Colombia; CRI = Costa Rica; RDO = Dominican Republic; HON = Honduras; MEX = Mexico; NIC = Nicaragua; PAN = Panama; PRY = Paraguay; SLV = El Salvador

There is a relationship between structural change and poverty incidence.

From the standpoint of job market dynamics, the main expression of structural change in rural economies is a reduction in the relative importance of agricultural employment, especially self-employment and unpaid family members, as compared to an increase in non-agricultural employment, especially salaried employment. That phenomenon is precisely what has been observed in the last decade in the majority of the countries. The most common pattern of change identified in eight of the twelve countries (Bolivia, Brazil, Chile, Costa Rica, Honduras, Mexico, Panama, and Paraguay) was a reduction in the relative importance of *100% family agriculture households*, the greater weight of *non-agricultural salary households* and *diversified salary households*, and a reduction or unchanged percentage of *agricultural salary households* (Table 12 in the Annex).

The information in Figure 19 makes it possible to identify three groups of countries by depth of structural change observed in their rural economies around 2010. The first group is countries with a more consolidated process of structural change, and includes Chile, Costa Rica and Mexico. In these three countries, more than 20% of households are *non-agricultural salaried* and less than 15% are *100% family agriculture households*. The second group is countries with a lower degree of structural change, and comprises Bolivia, Nicaragua, and Honduras, with less than 15% in *non-agricultural salary households* and more than 30% in *family agriculture households* around 2010. The third group are the countries in an intermediate situation, and encompasses Brazil, Colombia, Dominican Republic, El Salvador, Panama, and Paraguay (Figure 19).

Figures 12 and 19 also show that there is relationship between structural change and poverty incidence among rural households. The countries with the highest degree of structural change (Chile and Costa Rica) have the lowest poverty incidence. Poverty incidence rates ranges between average and high in countries with an intermediate degree of structural change (Brazil, Colombia, Dominican Republic, El Salvador, Panama, and Paraguay). Finally, countries with the lowest degree of structural change are the three poorest countries (Bolivia, Honduras and Nicaragua) (Table 9).

The three groups of countries grouped by depth of structural change in rural economies also share other commonalities in terms of the socio-demographic characteristics of the households (Table 9).

In the countries with a lower degree of structural change, *100% family agriculture households* have the highest poverty levels (above 60%). The heads of these households have the lowest educational levels (four years or less), but on average they are younger (52 years or less). These countries also have the highest percentages of female heads of *inactive households (*higher than 60%) and the highest percentages of female heads of *diversified family agriculture households.*

In contrast, the countries with a higher degree of structural change have the highest combined percentages of the three categories of *salary households* (more than 50%) and the lowest combined percentages of *family agriculture households* (less than 15%). Chile and Costa Rica, the countries with the lowest degree of poverty incidence, share the most commonalities. Both countries have lower percentages of *inactive households* with female heads (less than 50%), the highest educational levels among heads of *family agriculture households,* and also the highest average age among heads of *100% family agriculture households.*

Table 9. Latin America (12 countries): commonalities in household characteristics, by poverty level and depth of structural change.

Poverty incidence among total rural households around 2010	Depth of rural structural change: Low	Intermediate	High
Other than 50%	Honduras (37.9%-71.1%) Nicaragua (41.4%-53.2%) Bolivia (54.3%-52.7%)	Paraguay (34.2%-51.6%) El Salvador (18.1%-50%)	
	• There is a majority of 100% family agriculture households (except El Salvador) • 100% family agriculture households are the poorest (Bolivia, Paraguay, El Salvador) or second poorest (Honduras and Nicaragua). • Poverty among 100% family agriculture households is higher than 60% • Lower average age of heads of 100% family agriculture households (52 or less) • Less schooling among heads of 100% family agriculture households (four years or less, except Paraguay). • High percentage of women heads in inactive households (higher than 60%). Higher percentage of women heads in diversified family agriculture households. • Low percentage of inactive households (less than 10%, except El Salvador).		
20% to less than 50%		Dominican Republic (21.8% - 41.2%), Colombia (29.6% - 38.0%) Panama (27.7% - 34.5%), Brazil (34.5% - 28.8%)	Mexico (7.9% - 36.0%)
		• 100% family agriculture households (Brazil, Panama) and inactive households (Dominican Republic and Colombia) are the poorest. • 100% family agriculture households are the majority (except the Dominican Republic). • Low educational level of heads of 100% family agriculture households (four years or less)	• High percentage of non-agricultural salary workers. • Inactive households and 100% family agriculture households are the poorest. • Educational level among heads of 100% family agriculture households is intermediate (four years).
Less than 20%			Chile (10.7% - 7.8%) Costa Rica (8.5% - 17.5%)
			• Higher percentages of salary households (agricultural, non-agricultural, diversified). • Higher average age of heads of 100% family agriculture households (over 53) • Higher educational levels among heads of agricultural households (more than five years) • Lower percentages of women heads in inactive households (below 50%) • Higher poverty incidence in inactive households

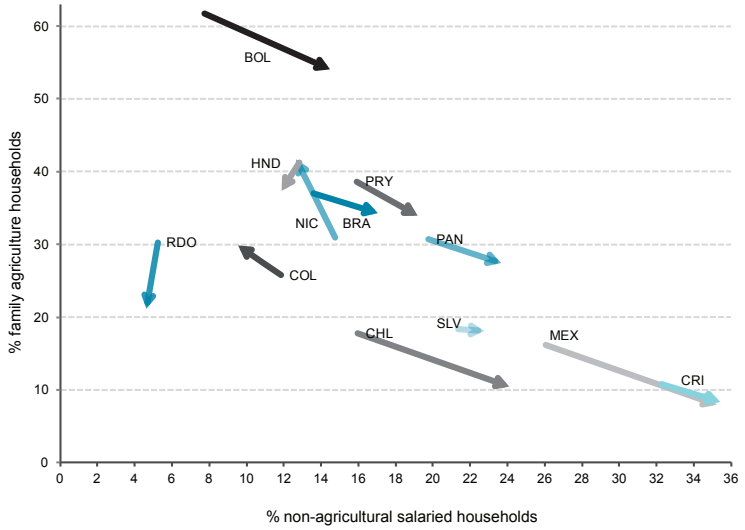
Source: Prepared by authors, Agricultural Development Unit, ECLAC.
Note: The first percentage corresponds to the weight of *100% family agriculture households*; the second to poverty incidence among total *rural households.*

The situation in countries with an intermediate degree of structural change is more heterogeneous, showing characteristics of the first two groups. With minor exceptions, Paraguay and El Salvador have specificities similar to the countries with a lower degree of structural change (Table 9). Panama and Brazil also share with those countries the highest degree of poverty among *100% family agriculture households,* while in the Dominican Republic and Colombia, the greatest poverty occurs among *inactive households,* as in the countries that have a more consolidated process of structural change. Moreover, in all these countries (except the Dominican Republic), the *100% family agriculture household* group continues to have the highest poverty incidence. In addition, educational level and age of heads of household are intermediate among the groups with higher and lower levels of structural change.

Public policy implications: with regard to structural change, family agriculture requires more than sector and productive policies

The data presented above make it possible to identify three major challenges faced by rural family agriculture households related to the following issues: a) viability, in light of structural changes in the rural economy; b) capabilities, associated with the low educational level of heads of this type of household; and c) generational change, given the demographic dynamics of the rural environment. These challenges must be addressed in order to further reduce poverty among *family agriculture households* and reduce rural poverty overall. Table 10 presents a summary of the type of policies considered appropriate for dealing with these challenges.

Figure 19. Latin America (12 countries): structural change in the rural environment, around 2000 and around 2010.



Source: Agricultural Development Unit, ECLAC.

The end of each line with no dot attached corresponds to "around 2000" and the end with a dot attached s corresponds to "around 2010." BOL = Bolivia; BRA = Brazil; CHL = Chile; COL = Colombia; CRI = Costa Rica; RDO = Dominican Republic; HON = Honduras; MEX = Mexico; NIC = Nicaragua; PAN = Panama; PRY = Paraguay; SLV = El Salvador.

Table 10. Examples of policies for addressing the challenges facing family agriculture

Challenges faced by family agriculture	Type of policy	Examples
Viability	*Policies for the diversification of (agricultural and non-agricultural) production*	• *Revive native products (e.g., quinoa)* • *Promote entrepreneurship* • *Promote innovation* • *Microcredits* • *Non-agricultural rural employment* • *Rural tourism* • *Information and communication technologies (e.g., access, development of applications).* • *Agricultural value added*
	Policies to develop family agriculture	• *Promote and develop agro-environmental activities* • *Public procurements that support family agriculture* • *Access to production resources (e.g., credit, land, water).* • *Sustainable natural resource management* • *Information and communication technologies (e.g., access, development of applications).* • *Promote associative arrangements and marketing* • *Promote short marketing circuits* • *Quality distinction policies (appellations of origin, geographical indications, collective brands)*
Capacites	*Policies to develop skills*	• *On-site training programs* • *Management training* • *Training in specialized subjects*
Generational	*Youth policies*	• *Promote youth entrepreneurship* • *Support innovation* • *Information and communication technologies (e.g., access, development of applications)* • *Support young new farmers*
	Gender policies	• *Policies to facilitate women producers' access to resources* • *Associative arrangements with positive discrimination in favor of women*
	Social protection policies	• *Economic support for the elderly (e.g., Costa Rica's noncontributory pensions program).* • *Health and social security.*

Source: Agricultural Development Unit, ECLAC.

To address the challenge of viability: policies to diversify production, build skills, and strengthen production

Structural change is a characteristic of development, brought about by changes in the relative profitability of different economic activities. As a result, structural change in rural areas poses challenges for the viability of family agriculture, especially in the case of subsistence or low-productivity farming. However, when analyzing structural change in rural areas and the implications for the viability of family agriculture, it is important to recognize that *rural* does not equate to *agriculture, farmer* does not equate to *unskilled immobile labor,* and *family agriculture* does not equate to *unproductive sector* (Saborío 2011). Thus, public policies should seek to generate appropriate conditions to:

a) Develop new production activities, either non-agricultural or in agricultural sectors that offer greater value added, in order to absorb the employment that may be lost on family farms that lose their unviability in the context of structural change;

b) Create skills in the rural population to facilitate their participation in new production activities; and

c) Promote more viable, higher-productivity sectors of family agriculture that have economic, social, and environmental potential, even among households associated with subsistence farming.

The third point above refers to a very important topic related to the productivity of family farms that produce for self-consumption. If viewed as a social problem that should be resolved with the help of educational or assistance programs promoted by the social ministries, the ministries of agriculture would not have much of a role to play as they could be allocating resources to programs with very low impact. From another standpoint, however, these farms (small as they are) can be considered to have production potential, and that require specific productive development programs for that type of farmer. This has been successfully accomplished by the *Programa Hambre Cero* (Zero Hunger Program) in Brazil, which has designed specific mechanisms to promote the purchase of local products from family farms.

Therefore, the "subsistence agriculture - commercial agriculture" or "viable agriculture - non-viable agriculture" duality should be reconsidered. Rather than selecting one or the other, a combined approach should be adopted that taps the synergies that can be objectively gained by forging a working relationship between the two sectors (Sotomayor *et al.* 2011). There will be some situations where, to leave poverty behind, it will be necessary to abandon low-productivity subsistence farming and take advantage of employment opportunities afforded in the diversified rural economy, with the support of skills-building policies. And when those options are limited by low educational levels or advanced age, social policies can play a supplementary role.

For their part, productive development policies that do not follow a strictly economic/raise-productivity rationale can also be relevant if they link environmental development and food safety objectives; for example, agro-environmental policies and policies that combine small-scale food production with conservation activities (Text Box 9).

To address the challenge of capabilities: skills training and development policies

It is important for heads of family agriculture households to have a minimum level of schooling (i.e., to have completed their primary education) for many reasons, three of which are essential:

a) A greater capacity to adopt new technologies and innovations is generally keyed to farmers' educational standing (Rodrigues and Rodríguez 2013).

b) A higher educational level facilitates access to better-paid jobs outside agriculture for all members of the household.

c) In a context of greater diversification of the structure of production, higher educational standing facilitates the possibilities of transforming the production structure.

Skills development policies for family agriculture should take into account not only the low educational level of heads of this type of household but also the fact that a growing proportion of these households are headed by women. Strategies are also needed to motivate and attract more youths to this sector of agriculture.

To address the challenge of generational change: gender and rural youth policies

In previous sections, we noted the low educational standing and older age of heads of family agriculture households compared to other types of households, particularly *non-agricultural salary households.* The relationship between low educational levels and the older age of heads of family agriculture households poses challenges in at least two areas. First, it limits the possibilities of innovation, inasmuch as it has been shown that new technologies and innovations tend be adopted less by older farmers with less schooling. This limits the possibility of implementing activities to build skills that will strengthen family agriculture.

The older age of heads of *family agriculture households,* as compared to other household groups, and the growing role of women heads of this type of household demonstrate the importance that should be given to gender and youth issues in policies to promote and develop capacities for family agriculture.

Box 9. Productive development of family agriculture: combining environmental and food security objectives

Following are ten operating criteria proposed for family agriculture policies that emphasize environmental and food security objectives. These criteria have been drawn from experiences gained by governments and international organizations working in the region and can serve as the basis for defining *ad hoc* productive and environmental programs, which can be called production and environmental development (PED) projects.

- The objective is to **strengthen the on-farm consumption component**, tapping all the productive and environmental conservation potential offered by the most undercapitalized and bypassed of small farmers. These are not social projects.

- **The market is important but plays a secondary role**. Producing for the market is optional and limited mainly to farmers with the capacity for it. The principal aim of production is food security.

- The scale of work is **the farm and the micro-watershed.** This will involve concurrent actions, on the farms themselves and outside them, using social networks.

- Use **modern technology adapted to local conditions**. The idea is to recover tacit know-how (traditional, ethnic, others) and use all modern technologies available, even the more advanced technologies (ICT, genetics, micro-irrigation, microcredits, others). Create a technology mix keyed to the contours and characteristics of each agro-ecological and social reality.

- Make **productive and environmental investments in the farms** (in both productive and non-productive areas), as well as in common property areas, with financial support from the government. Investments should be designed to use the minimum amount of assets required to achieve a qualitative leap in productive and environmental development.

- They are well-designed, **simple projects** involving little bureaucratic red tape, preferably managed by the municipalities (or in partnership with them), and using a high degree of informatics resources. The projects are participatory, with broad governance structures (government, businesses, social organizations, NGOs, others), and connected to other governmental incentives and programs. Programs to regularize land ownership are essential to promote investment and improve access to credit.

- The projects promote **self-responsibility** (individual, family, group, networks) expressed in terms of co-financing, appraisal of own contributions, and co-participation. There is a focus on projects targeting women and youths, although anyone willing to meet the commitments agreed upon is eligible. Broad-reaching programs are also promoted, using information and communications technologies (ICT) to provide credit and technical assistance at a reasonable cost, as well as horizontal technical assistance mechanisms (smallholder-smallholder) to obtain high impact.

- Active participation of **private enterprise** in the financing of projects and possibly their execution, under the inclusive business or corporate social responsibility models.

- Use a **baseline**, to ensure that projects can be evaluated and facilitate accountability.

- **Partnerships** among governments, international agencies, and businesses in connection with national climate change adaptation and mitigation strategies and the Millennium Development Goals (extreme poverty and hunger eradication).

Source: Sotomayor *et al.* 2011

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Annex

Table 11. Typology of households by occupational status of heads of household and other employed household members

Employed household members		Occupation of heads of households					
		Agricultural salary household	Non-agricultural salary household	Employers	Agricultural self-employed	Non-agricultural self-employed	Inactive or unemployed
Occupational status of other employed members	Only agricultural salary	Agricultural salary household	Diversified salary household	Employer household	100% family agriculture household	Non-agricultural self-employed household	Agricultural salary household
	Only non-agricultural salary	Diversified salary household	Non-agricultural salary household	Employer household	Diversified family agriculture household	Non-agricultural self-employed household	Non-agricultural salary household
	Agricultural and non-agricultural salary	Diversified salary household	Diversified salary household	Employer household	Diversified family agriculture household	Non-agricultural self-employed household	Diversified salary household
	Agricultural or non-agricultural employers	Diversified salary household	Diversified salary household	Employer household	Diversified family agriculture household	Employer household	Business household
	Agricultural self-employed	100% family agriculture household	Diversified family agriculture household	Employer household	100% family agriculture household	Diversified family agriculture household	100% family agriculture household
	Non-agricultural self-employed	Diversified salary household	Diversified salary household	Employer household	Diversified family agriculture household	Non-agricultural self-employed household	Non-agricultural self-employed household
	Salary workers + agricultural self-employed	Diversified family agriculture household	Diversified family agriculture household	Employer household	Diversified family agriculture household	Diversified family agriculture household	Diversified family agriculture household
	Salary workers + non-agricultural self-employed	Diversified salary household	Diversified salary household	Employer household	Diversified family agriculture household	Non-agricultural self-employed household	Non-agricultural self-employed household
	Unpaid family workers	Agricultural salary household	Non-agricultural salary household	Employer household	100% family agriculture household	Non-agricultural self-employed household	Inactive household
Inactive	**Inactive or unemployed**	Agricultural salary household	Non-agricultural salary household	Employer household	100% family agriculture household	Non-agricultural self-employed household	Inactive household

Table 12. Relative distribution of households, by household type and area, around 2000 and 2010 (percentage of total rural households).

		Type of household and year																	
		Sal. agric		Sal. non agric		Sal. divers.		Employer		CP non agric		100% fam agric		Div. fam agric		Inactive		Other	
Country	Zone	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Bolivia	National	2.7	2.3	28.3	34.9	2.9	3.2	7.1	7.1	23.9	22.4	25.2	20.1	2.0	1.8	6.8	7.3	1.1	0.9
	Urban	1.1	0.9	40.7	45.6	3.8	3.4	5.8	6.7	34.0	30.0	3.3	2.2	1.3	0.8	8.5	9.1	1.5	1.3
	Rural	5.2	5.0	7.7	14.3	1.5	2.8	9.2	7.8	7.0	7.8	61.8	54.3	3.0	3.6	4.0	3.8	0.6	0.6
Brazil	National	4.6	3.5	45.9	49.2	3.0	3.1	5.1	3.7	17.6	15.9	8.1	7.3	1.6	1.4	13.4	15.4	0.7	0.5
	Urban	1.9	1.6	51.5	54.4	2.9	3.0	5.2	3.8	19.6	17.4	3.0	2.9	0.9	0.8	14.3	15.7	0.7	0.4
	Rural	20.0	15.3	13.6	16.8	3.8	4.1	4.3	2.5	6.0	7.0	37.1	34.5	5.8	5.6	8.8	13.3	0.8	0.9
Chile	National	6.5	4.4	50.6	52.7	3.8	4.3	4.8	1.9	14.7	15.6	3.8	2.8	0.9	0.8	14.7	17.3	0.2	0.2
	Urban	2.8	2.0	56.0	57.0	3.3	3.7	5.1	1.9	16.1	16.5	1.6	1.6	0.5	0.5	14.3	16.7	0.3	0.1
	Rural	30.1	20.7	15.9	23.9	6.9	8.5	2.5	1.9	5.9	9.5	17.9	10.7	3.4	3.4	17.0	21.3	0.3	0.2
Colombia	National	6.3	5.2	31.1	30.4	3.7	3.3	5.9	5.8	28.2	31.1	9.6	9.7	2.8	2.4	11.0	10.8	1.4	1.3
	Urban	2.0	1.0	37.3	36.5	3.3	3.1	6.0	5.7	32.8	36.1	4.4	3.8	1.4	1.2	11.7	11.5	1.0	1.1
	Rural	19.6	19.8	11.8	9.7	4.9	4.3	5.8	6.1	14.1	13.8	25.8	29.6	7.0	6.4	8.8	8.6	2.2	1.6
Costa Rica	National	7.1	6.7	45.8	50.0	4.5	5.1	9.1	4.4	15.3	14.0	5.4	4.1	1.6	1.4	10.8	14.0	0.4	0.3
	Urban	1.3	1.1	54.7	58.8	3.7	3.9	9.5	4.8	16.9	15.8	1.8	1.5	0.6	0.6	11.0	13.4	0.5	0.2
	Rural	15.7	16.2	32.2	35.2	5.6	7.1	8.5	3.6	12.7	11.0	10.8	8.5	3.2	2.9	10.4	15.0	0.9	0.5
Panama	National	4.7	3.8	43.7	49.1	3.4	3.0	3.5	3.7	16.5	15.4	12.9	10.0	2.5	1.9	12.4	12.8	0.4	0.3
	Urban	1.0	0.8	56.9	61.0	3.2	2.5	4.2	4.2	17.6	16.5	3.1	1.7	0.5	0.4	13.4	12.6	0.2	0.2
	Rural	11.5	10.3	19.7	23.5	3.9	4.1	2.4	2.5	14.5	13.1	30.8	27.7	6.0	5.3	10.7	13.3	0.6	0.4
El Salvador	National	6.5	7.2	39.2	38.4	3.8	4.2	5.9	4.8	15.0	21.2	8.3	8.5	2.6	2.4	12.8	12.4	5.9	0.9
	Urban	1.5	2.6	49.7	46.8	3.1	3.7	6.3	5.2	17.1	25.0	2.3	3.4	0.8	1.1	12.4	11.3	6.8	1.0
	Rural	15.0	16.2	21.3	22.5	4.8	5.2	5.3	4.1	11.6	13.9	18.3	18.1	5.7	4.9	13.5	14.3	4.5	0.7
Honduras	National	8.0	6.2	28.8	26.4	3.0	3.6	3.5	0.7	19.0	24.4	23.3	22.1	5.4	6.4	8.1	8.8	0.9	1.4
	Urban	1.7	1.2	45.2	41.4	3.2	3.5	5.3	0.5	27.3	34.5	4.7	5.6	2.4	2.4	9.1	9.9	1.1	0.9
	Rural	14.2	11.0	12.8	12.0	2.7	3.7	1.7	0.9	10.8	14.7	41.3	37.9	8.4	10.2	7.1	7.8	0.9	1.9
Mexico	National	5.6	4.9	49.8	54.4	3.8	4.3	6.4	10.7	15.2	9.3	6.8	3.7	2.6	1.0	8.2	10.5	1.6	1.2
	Urban	0.5	0.8	63.4	64.8	2.9	3.3	6.2	8.1	16.6	10.1	1.4	1.3	0.3	0.2	7.7	10.6	1.1	0.8
	Rural	14.6	12.6	26.0	35.0	5.3	6.3	6.6	15.6	12.8	7.9	16.2	8.1	6.7	2.4	9.1	10.3	2.7	1.8
Nicaragua	National	9.4	7.4	32.1	29.2	4.0	4.5	7.8	1.5	19.6	24.2	14.9	19.9	3.8	4.7	7.0	7.6	1.4	1.0
	Urban	5.2	2.4	43.1	40.0	3.7	4.8	6.6	1.4	26.7	34.1	4.7	5.9	1.6	2.3	6.9	8.2	1.4	1.0
	Rural	16.1	15.0	14.7	12.7	4.4	4.1	9.6	1.7	8.2	9.0	31.0	41.4	7.2	8.4	7.2	6.6	1.6	1.2
Paraguay	National	3.7	2.8	31.4	36.6	3.9	4.1	7.7	6.5	18.6	19.0	18.9	15.9	5.4	4.9	9.1	9.0	1.5	1.2
	Urban	0.6	0.7	43.3	48.2	4.3	4.4	9.8	8.0	24.9	23.3	3.9	3.8	1.7	1.5	10.6	9.2	1.0	0.9
	Rural	7.8	6.0	15.9	19.0	3.4	3.8	4.8	4.2	10.3	12.5	38.6	34.2	10.2	10.0	7.0	8.9	1.9	1.3
Dominican	National	2.1	1.8	36.2	33.8	2.1	3.1	3.5	3.1	25.3	27.9	13.0	10.1	3.4	3.6	14.1	16.1	0.3	0.5
Rep.	Urban	0.5	0.4	44.8	39.5	2.3	3.0	4.3	3.4	28.1	30.2	3.7	4.6	1.5	1.5	14.4	16.6	0.4	0.0
	Rural	5.2	4.6	20.1	21.8	1.8	3.3	1.9	2.2	20.1	22.9	30.4	21.8	6.9	7.9	13.4	15.0	0.3	0.4

Source: Agricultural Development Unit, ECLAC.

Table 13. Poverty incidence, by household type and area, around 2000 and 2010 (percentage of total households in each group)

		Type of household and year																			
		Total		Sal. agric		Sal. non agric		Sal. divers.		Employer		CP non agric		100% fam agric		Div. fam agric		Inactive		Other	
Country	Zone	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Bolivia	*National*	55.5	36.3	55.1	23.8	39.8	22.8	37.8	17.1	44.2	26.7	51.9	33.6	84.5	67.3	50.9	41.9	49.2	44.2	42.0	29.5
	Urban	44.9	27.7	64.6	29.8	39.8	22.1	39.4	9.9	25.2	15.9	52.7	33.2	62.4	48.4	58.7	68.8	43.2	44.1	41.1	21.6
	Rural	73.1	52.7	51.7	21.7	39.5	26.8	31.4	33.9	64.1	44.5	45.4	36.6	86.4	68.8	45.1	30.1	70.7	44.9	45.7	64.2
Brazil	*National*	29.9	16.2	60.3	34.9	27.0	12.6	29.1	8.8	5.9	1.9	29.0	14.9	45.1	31.3	39.8	18.4	29.9	22.2	27.3	19.9
	Urban	27.4	14.3	64.2	33.6	26.4	12.3	26.5	7.8	5.0	1.3	28.4	14.2	36.7	21.9	39.9	18.2	30.1	22.3	23.3	15.6
	Rural	44.7	28.0	58.2	35.7	38.8	19.4	40.4	13.1	12.3	8.3	40.2	26.2	49.1	36.2	39.7	18.6	28.3	21.4	46.3	33.0
Chile	*National*	16.3	9.2	30.8	11.6	15.2	6.8	10.7	2.8	1.4	1.3	11.7	6.2	20.3	4.9	9.1	12.1	24.4	21.9	4.0	9.9
	Urban	15.9	9.5	42.0	19.6	15.2	6.9	11.6	3.3	1.3	1.3	11.8	6.4	19.2	4.4	8.0	23.7	24.2	22.2	4.3	11.9
	Rural	19.2	7.8	24.0	6.3	14.9	4.0	8.0	1.6	2.2	1.7	10.0	4.2	20.9	5.4	10.1	1.6	25.7	20.4	1.9	0.0
Colombia	*National*	42.2	27.7	50.6	26.0	29.2	14.9	28.2	12.2	21.2	14.4	48.3	32.8	67.8	48.7	60.3	43.3	48.5	39.9	31.7	25.0
	Urban	38.6	24.7	64.0	43.4	29.8	15.0	28.4	13.1	16.4	10.4	47.0	31.5	52.4	37.7	63.6	52.8	45.9	35.7	26.9	22.7
	Rural	53.2	38.0	46.5	23.0	23.7	14.4	27.7	9.9	36.3	27.1	57.3	44.2	75.8	53.6	58.2	37.1	59.5	58.9	38.6	30.5
Costa Rica	*National*	18.6	16.0	13.4	13.4	9.1	11.0	2.8	5.7	11.0	4.7	23.0	23.3	45.0	30.9	17.0	13.2	56.4	31.1	18.4	17.6
	Urban	15.9	15.1	10.9	28.4	9.3	11.5	3.4	6.1	8.3	4.5	22.1	23.7	20.4	16.1	23.3	25.0	49.2	25.8	13.0	26.3
	Rural	22.8	17.5	13.7	11.6	8.6	9.7	2.3	5.3	15.6	5.2	24.6	22.3	51.0	35.2	15.4	8.9	67.9	39.3	23.2	11.7
El Salvador	*National*	42.9	40.2	73.8	64.1	29.5	29.3	34.8	34.3	25.7	16.5	44.6	39.6	77.8	69.7	59.4	53.1	55.3	50.3	33.3	34.6
	Urban	34.7	35.5	74.7	73.0	28.7	28.5	32.1	36.4	16.1	10.2	44.0	40.9	59.0	58.5	61.4	62.2	48.9	45.9	28.3	33.1
	Rural	56.8	49.3	73.7	61.4	32.8	32.2	37.6	31.4	45.1	31.3	45.9	35.5	81.8	73.7	59.0	49.2	65.4	57.1	46.1	38.5
Honduras	*National*	70.9	61.2	93.2	87.3	53.6	40.1	70.4	55.1	30.4	20.9	70.3	55.9	89.5	81.2	82.8	72.6	68.7	67.0	68.3	68.9
	Urban	60.4	50.9	86.3	89.4	52.6	39.1	63.7	45.2	30.9	21.6	70.5	56.0	81.0	71.4	84.2	69.1	63.3	63.6	62.4	65.8
	Rural	81.1	71.1	93.9	87.0	56.9	43.5	78.1	64.2	29.0	20.5	69.8	55.8	90.4	82.5	82.5	73.4	75.4	71.1	75.1	70.4
Mexico	*National*	33.3	29.3	75.9	58.9	29.0	27.4	38.7	28.0	11.4	27.0	25.7	20.2	57.6	50.0	56.6	45.4	31.1	27.0	29.8	32.2
	Urban	26.5	25.7	69.4	43.5	27.9	27.7	27.2	27.3	10.2	15.0	25.6	21.1	39.4	29.7	57.9	31.5	24.2	23.5	15.1	23.7
	Rural	45.1	36.0	76.3	60.8	33.8	26.3	49.7	28.7	13.4	38.5	25.9	18.0	60.2	56.1	56.5	47.0	41.3	33.8	40.3	39.6
Nicaragua	*National*	36.6	33	65.3	59.5	23.0	19.2	42.6	46.2	25.4	6.7	25.5	20.9	65.8	56.4	57.6	47.7	29.9	27.3	20.8	28.0
	Urban	22.4	19.8	53.1	49.9	18.1	16.6	25.1	32.3	12.8	2.0	23.8	18.7	39.2	32.5	46.0	36.4	13.1	13.5	17.4	22.7
	Rural	59.0	53.2	71.6	61.9	45.7	31.7	66.1	70.7	39.2	12.6	34.6	33.4	72.3	61.5	61.6	52.3	55.4	53.6	25.5	35.2
Panama	*National*	30.0	20	43.2	44.4	16.9	9.2	20.1	10.1	6.4	1.2	28.0	12.6	64.5	52.9	42.0	25.6	45.1	43.1	11.7	19.1
	Urban	21.8	13.0	48.1	63.4	16.9	8.9	15.2	6.9	5.7	1.5	26.0	10.7	27.6	15.9	35.8	28.4	40.0	36.9	3.8	4.8
	Rural	44.8	34.5	42.4	41.4	16.9	10.6	27.7	14.3	8.5	0.4	32.5	17.8	71.2	57.8	42.9	25.1	56.7	55.6	16.1	38.4
Paraguay	*National*	50.7	44	67.5	54.6	38.6	36.5	42.7	23.8	24.6	17.8	48.2	41.6	75.3	71.4	63.6	46.6	60.4	55.0	28.7	20.9
	Urban	42.3	38.6	64.9	81.1	39.7	38.4	31.6	17.8	19.1	12.8	47.2	41.8	62.2	61.1	70.1	52.3	55.4	50.6	33.6	24.4
	Rural	61.6	51.6	67.7	49.9	34.5	29.3	61.2	34.0	39.5	32.4	51.5	40.9	77.0	73.1	62.2	45.3	70.3	62.0	25.3	17.4
Dominican	*National*	42.2	39	58.4	58.3	35.2	45.1	22.6	20.8	5.7	4.0	35.4	16.4	53.7	39.7	39.0	29.9	73.2	74.4	15.3	6.3
Republic	*Urban*	38.0	37.6	51.4	64.9	33.3	43.7	19.4	19.8	2.7	2.3	35.7	17.1	46.3	41.0	49.5	28.9	67.3	71.3	0.0	5.1
	Rural	50.3	41.2	59.5	57.0	42.8	50.5	30.1	22.8	18.5	9.5	34.6	14.6	55.3	39.2	34.6	30.3	85.1	81.6	48.2	11.0

Source: Agricultural Development Unit, ECLAC.

Table 14. Percentage of households with female head of household, by type of household and area, around 2000 and of 2010 (percentage of total households in each group).

		Type of household and year																	
		Total		Sal. agric		Sal. non agric		Sal. divers.		Employer		CP non agric		100% fam agric		Div. fam agric		Inactive	
Country	Zone	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Bolivia	*National*	19.8	24.5	10.6	16.3	18.2	21.7	6.6	14.8	11.2	16.2	26.3	31.5	11.8	17.7	14.7	24.0	55.4	49.7
	Urban	23.5	26.5	11.6	20.9	18.7	21.7	6.9	17.6	12.0	18.3	27.7	30.8	15.1	30.2	12.3	18.4	54.0	47.2
	Rural	13.8	20.5	10.2	14.7	13.6	21.8	5.7	8.4	10.5	12.9	15.6	36.4	11.5	16.8	16.6	26.5	60.5	61.2
Brazil	*National*	24.4	36.4	8.7	17.5	25.8	38.1	16.2	32.5	10.3	20.4	17.5	28.4	16.8	25.6	7.4	17.8	48.3	54.7
	Urban	26.3	38.7	12.2	24.7	26.2	38.7	17.7	35.1	10.6	21.3	17.8	29.0	28.0	43.9	8.1	22.0	49.1	56.0
	Rural	13.5	21.6	6.8	12.9	17.4	26.6	9.8	20.9	7.5	11.9	13.0	19.5	11.5	16.0	6.8	14.2	40.8	45.5
Chile	*National*	23.2	38.8	12.3	26.4	21.9	37.7	17.2	24.9	11.1	26.1	20.5	34.6	19.5	37.4	20.2	29.5	42.1	54.5
	Urban	24.4	40.5	17.7	36.9	22.0	38.3	18.7	25.9	11.2	26.9	20.7	35.5	34.0	55.1	29.4	43.1	43.7	56.6
	Rural	15.6	27.2	8.9	19.5	17.7	28.1	12.2	22.2	8.9	20.5	17.4	23.8	10.7	19.6	12.2	17.2	33.4	43.6
Colombia	*National*	25.7	32.0	8.8	8.6	27.5	33.5	18.5	21.0	14.1	16.8	26.7	34.6	18.5	21.4	12.3	18.9	47.2	57.1
	Urban	28.5	35.5	16.3	16.1	28.0	34.1	21.0	25.8	14.0	18.8	26.7	34.5	31.5	39.6	9.5	20.4	48.8	57.4
	Rural	16.9	20.1	6.5	7.3	22.6	26.9	13.1	9.5	14.4	10.6	26.7	35.6	11.7	13.3	14.0	18.0	40.8	55.6
Costa Rica	*National*	25.0	33.9	11.7	18.5	26.2	36.4	22.2	23.3	10.5	15.7	24.3	28.9	16.2	17.5	15.8	12.0	49.9	54.8
	Urban	28.4	38.7	11.6	29.1	27.9	39.0	22.1	27.0	11.4	17.2	25.6	30.9	45.2	39.5	25.1	4.3	52.6	60.8
	Rural	19.7	25.8	11.7	17.2	21.6	28.9	22.4	19.8	8.9	12.3	21.7	24.0	9.1	11.2	13.3	14.8	45.7	45.7
El Salvador	*National*	32.3	35.0	15.7	18.3	29.1	29.9	20.8	20.1	19.7	21.3	47.4	50.4	13.5	20.4	13.9	16.6	53.6	59.3
	Urban	35.3	37.5	12.5	21.5	29.9	30.5	17.0	21.8	23.6	23.5	46.8	49.7	27.5	35.8	7.6	17.2	50.8	57.9
	Rural	27.3	30.3	16.2	17.3	26.3	27.4	24.9	17.8	11.8	15.9	49.1	53.0	10.5	14.8	15.3	16.3	58.1	61.3
Honduras	*National*	25.2	31.7	14.0	17.5	27.1	33.0	14.2	21.8	15.3	16.2	35.3	40.8	9.6	16.5	16.9	23.8	66.0	64.4
	Urban	31.4	37.7	20.0	18.8	28.7	35.9	16.6	28.0	15.2	3.9	33.9	38.8	23.6	32.4	12.9	21.5	63.7	57.6
	Rural	19.2	25.9	13.3	17.4	21.7	23.7	11.4	16.1	15.4	23.2	38.7	45.2	8.0	14.2	18.0	24.4	68.8	72.7
Mexico	*National*	18.4	24.6	6.3	11.8	17.4	23.6	8.0	14.4	6.9	14.5	23.2	31.9	14.7	15.2	10.2	6.5	45.8	49.7
	Urban	19.6	27.1	5.7	9.0	18.2	25.0	6.4	19.7	5.5	16.4	21.8	30.3	26.3	31.7	17.9	5.4	45.0	48.8
	Rural	16.2	19.9	6.3	12.2	13.7	18.7	9.6	9.3	9.2	12.6	26.3	35.7	13.0	10.3	9.5	6.6	47.1	51.6
Nicaragua	*National*	28.8	34.4	13.6	19.7	31.2	37.5	23.9	36.7	13.7	15.9	43.2	43.5	14.8	17.0	14.1	21.3	58.8	66.0
	Urban	34.9	41.7	9.9	27.1	33.5	39.6	24.5	39.8	19.1	15.6	43.3	42.5	33.2	39.9	15.5	17.4	60.4	68.0
	Rural	19.2	23.2	15.6	17.8	20.6	27.1	23.0	31.3	7.9	16.2	42.7	49.0	10.3	12.0	13.5	22.8	56.4	62.2
Panama	*National*	24.3	31.9	5.9	12.7	26.9	34.2	18.7	27.0	9.1	19.4	21.6	27.5	12.6	20.2	7.8	11.3	47.5	51.6
	Urban	28.9	35.1	5.7	15.6	28.0	35.0	23.6	34.9	8.7	20.4	23.3	27.9	40.6	51.3	10.6	16.1	47.3	50.4
	Rural	15.9	25.0	5.9	12.3	20.8	29.7	11.3	16.8	10.3	15.6	18.0	26.2	7.5	16.0	7.4	10.6	47.9	54.1
Paraguay	*National*	25.3	30.9	20.9	18.1	25.5	32.1	17.5	23.7	10.9	16.8	32.2	34.9	16.3	21.9	12.4	25.7	56.8	55.4
	Urban	29.6	33.6	26.7	32.7	26.3	32.4	18.7	22.3	12.5	19.9	33.0	35.8	35.3	37.5	20.1	31.5	57.1	52.4
	Rural	19.6	26.7	20.3	15.5	22.3	30.7	15.5	26.0	6.7	8.1	29.5	32.5	13.8	19.3	10.8	24.4	56.2	60.0
Dominican	*National*	30.4	34.0	5.7	8.1	32.2	38.1	22.4	31.9	15.6	17.9	25.0	25.8	16.6	18.7	10.0	10.8	62.3	61.4
Republic	*Urban*	34.2	38.2	6.6	16.8	34.0	40.8	21.8	32.4	17.0	19.6	25.5	27.3	34.1	32.5	14.0	11.5	62.7	62.3
	Rural	23.2	25.2	5.5	6.5	24.5	27.9	23.8	31.0	9.4	12.5	23.5	21.9	12.5	12.6	8.3	10.6	61.6	59.2

Source: Agricultural Development Unit, ECLAC.

Table 15. Average age of heads of household, by type of household and area, around 2000 and of 2010 (years completed)

		Type of household and year																	
		Total		Sal. agric		Sal. non agric		Sal. divers.		Employer		CP non agric		100% fam agric		Div. fam agric		Inactive	
Country	Zone	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Bolivia	*National*	44	46	39	43	38	41	40	46	45	45	44	47	49	52	47	50	53	49
	Urban	43	45	40	38	39	41	44	48	44	44	45	47	56	59	45	52	51	47
	Rural	46	49	39	45	38	38	36	40	46	47	45	45	48	51	47	49	57	60
Brazil	*National*	46	48	42	42	42	44	43	45	51	47	44	47	53	54	49	50	62	62
	Urban	46	48	43	43	42	44	45	45	45	47	45	47	57	58	51	52	59	62
	Rural	47	49	41	42	41	43	41	42	51	53	43	46	50	52	48	49	64	63
Chile	*National*	50	52	46	49	46	48	50	50	55	52	50	52	55	58	55	52	63	65
	Urban	48	52	45	48	45	48	48	50	49	52	49	52	58	60	52	48	61	65
	Rural	51	54	46	50	47	49	50	50	55	56	50	52	54	57	55	56	63	67
Colombia	*National*	47	47	42	42	42	42	44	45	49	49	48	48	53	52	51	50	57	58
	Urban	47	47	42	43	42	42	44	45	47	47	47	48	58	58	52	51	57	58
	Rural	46	47	41	41	42	42	44	44	50	53	48	47	49	49	50	49	59	60
Costa Rica	*National*	45	49	41	43	41	45	44	47	46	48	46	50	54	55	52	52	61	63
	Urban	47	49	41	44	44	46	46	48	48	49	48	50	62	61	54	52	62	64
	Rural	45	48	41	43	41	43	44	47	46	48	45	48	50	53	51	52	59	60
El Salvador	*National*	45	48	47	44	43	43	48	46	51	49	49	50	53	53	55	54	58	59
	Urban	48	48	50	46	44	43	47	47	50	47	50	50	59	59	58	54	59	60
	Rural	46	48	45	43	42	41	49	46	52	51	49	48	50	51	54	54	57	56
Honduras	*National*	45	48	42	44	40	44	46	47	46	49	46	48	47	51	50	54	53	57
	Urban	44	48	44	43	40	44	46	47	45	51	46	49	54	59	51	57	51	58
	Rural	45	49	42	44	40	43	45	46	47	48	46	48	46	50	50	53	55	57
Mexico	*National*	46	49	45	44	42	45	47	47	50	50	49	51	55	54	54	54	58	62
	Urban	45	48	46	46	42	45	47	47	45	49	49	51	60	60	58	56	60	61
	Rural	47	49	45	44	41	42	46	46	52	52	50	51	54	52	54	54	56	63
Nicaragua	*National*	45	47	41	43	42	43	47	47	47	46	47	47	48	50	50	50	57	58
	Urban	46	47	42	49	43	44	47	48	49	46	48	47	52	59	51	52	54	56
	Rural	46	46	41	42	41	40	47	46	45	45	47	47	48	48	50	49	59	61
Panama	*National*	47	50	43	46	42	45	47	49	50	49	46	49	52	55	54	54	58	64
	Urban	47	49	44	43	44	45	47	48	48	48	46	49	59	63	54	54	57	64
	Rural	48	52	42	46	42	46	47	49	51	53	46	51	50	53	55	54	58	63
Paraguay	*National*	46	49	44	46	41	44	43	46	45	48	47	50	52	53	51	51	55	62
	Urban	47	50	50	49	43	45	46	47	45	49	48	51	59	59	52	55	53	62
	Rural	48	49	40	45	38	40	40	44	46	47	44	47	49	52	50	50	58	62
Dominican Republic	*National*	47	48	46	41	43	44	48	50	48	51	45	46	54	54	52	53	57	58
	Urban	47	47	47	44	43	44	48	49	45	51	46	46	60	56	55	50	56	56
	Rural	48	50	44	40	43	44	48	51	48	51	45	45	51	52	50	54	58	61

Source: Agricultural Development Unit, ECLAC.

Table 16. Average educational level of heads of household, by type of household and area, around 2000 and 2010 (years of formal education completed)

		Type of household and year																	
		Total		Sal. agric		Sal. non agric		Sal. divers.		Employer		CP non agric		100% fam agric		Div. fam agric		Inactive	
Country	Zone	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010	2000	2010
Bolivia	*National*	7.1	7.9	5.4	4.9	9.8	10.8	7.3	8.8	7.0	8.9	7.1	8.3	4.2	4.1	5.1	4.1	7.2	8.6
	Urban	8.8	9.6	6.4	6.0	10.1	10.9	7.5	9.6	10.7	10.9	7.9	8.7	5.9	4.7	5.6	4.4	9.0	9.7
	Rural	4.3	4.8	4.5	4.5	9.0	10.2	7.7	7.0	3.6	5.5	5.9	5.8	3.6	4.1	4.7	3.9	3.2	3.5
Brazil	*National*	4.6	7.1	2.2	3.6	5.7	8.4	4.0	7.1	5.1	9.9	4.9	7.2	2.4	3.4	2.6	4.1	2.7	5.0
	Urban	6.3	7.7	2.3	4.0	7.0	8.5	5.5	7.6	9.4	10.3	6.0	7.4	3.1	4.5	3.0	4.6	4.6	5.4
	Rural	2.5	3.6	2.1	3.3	4.3	5.8	2.7	4.8	4.3	5.8	3.7	4.8	2.0	2.8	2.4	3.7	1.4	2.1
Chile	*National*	7.2	10.0	6.1	7.2	8.1	10.9	5.8	9.2	9.2	12.7	6.8	9.9	5.3	7.2	5.5	7.8	5.3	8.0
	Urban	10.0	10.5	7.4	8.2	10.9	11.1	9.0	9.8	12.9	13.1	9.4	10.0	7.4	8.3	6.5	9.1	7.9	8.5
	Rural	5.5	6.8	5.5	6.5	7.3	8.6	5.4	7.6	9.0	9.9	6.3	8.3	4.7	6.1	5.3	6.7	3.9	5.0
Colombia	*National*	6.2	7.5	4.0	4.2	7.8	9.8	5.0	7.6	7.3	8.6	6.2	7.5	3.4	3.9	3.5	3.9	5.5	6.6
	Urban	7.8	8.5	4.6	5.7	9.3	10.0	7.6	8.7	10.0	9.8	7.0	7.8	4.3	5.0	4.2	4.3	6.6	7.3
	Rural	3.8	4.3	3.5	4.0	7.0	6.9	3.8	4.8	5.4	4.6	4.5	5.0	2.7	3.4	2.9	3.6	3.4	3.5
Costa Rica	*National*	6.6	8.2	4.5	5.1	7.5	9.1	6.0	7.6	7.5	10.0	6.6	8.0	4.5	5.7	4.5	5.4	5.5	6.7
	Urban	8.7	9.3	6.0	6.7	9.4	9.6	8.5	9.7	9.8	10.6	7.8	8.6	5.3	8.3	6.0	5.1	6.7	7.9
	Rural	5.7	6.5	4.3	4.9	7.3	7.8	5.9	5.7	6.9	8.7	6.1	6.6	4.0	5.0	4.2	5.5	3.8	4.9
El Salvador	*National*	4.8	6.2	2.4	3.2	6.3	8.4	4.2	5.2	5.4	7.7	4.1	5.6	2.4	2.6	2.1	2.8	4.1	4.3
	Urban	6.7	7.7	3.2	4.0	8.5	9.2	6.6	6.6	8.1	9.4	5.1	6.2	3.5	3.6	2.4	3.0	5.7	5.4
	Rural	2.6	3.4	2.0	3.0	4.7	5.4	2.7	3.3	3.2	3.7	2.9	3.5	1.8	2.3	1.8	2.7	2.0	2.5
Honduras	*National*	4.7	6.3	2.7	4.5	6.9	8.5	4.8	6.5	6.9	6.9	4.9	6.9	2.6	4.2	2.7	4.4	4.6	6.2
	Urban	6.6	8.3	4.0	7.3	7.8	9.1	6.1	8.0	9.5	9.9	5.5	7.5	3.6	5.7	3.4	5.5	6.0	7.7
	Rural	2.8	4.6	2.2	4.2	5.1	6.4	2.9	5.2	5.1	5.3	3.4	5.4	2.3	4.0	2.2	4.1	2.4	4.5
Mexico[a]	*National*	0.0	7.7	0.0	4.5	0.0	9.2	0.0	6.7	0.0	7.4	0.0	7.5	0.0	4.5	0.0	4.2	0.0	6.4
	Urban	0.0	9.2	0.0	6.8	0.0	9.6	0.0	8.7	0.0	9.8	0.0	8.1	0.0	6.6	0.0	7.1	0.0	7.9
	Rural	0.0	5.2	0.0	4.2	0.0	7.6	0.0	4.9	0.0	5.1	0.0	5.8	0.0	3.9	0.0	3.8	0.0	3.4
Nicaragua	*National*	4.2	5.8	2.4	2.4	6.1	8.1	4.2	4.8	4.9	7.7	3.8	6.1	2.5	2.8	2.2	3.7	3.4	4.7
	Urban	5.8	7.2	2.9	4.3	7.0	8.4	6.1	5.7	7.1	9.7	5.1	6.5	4.0	4.3	2.7	5.2	5.4	6.1
	Rural	2.4	3.4	1.9	1.9	4.8	6.2	2.2	3.2	3.6	5.0	2.7	4.0	1.6	2.5	1.8	3.1	1.7	1.9
Panama	*National*	7.6	9.1	5.6	5.2	9.0	11.2	6.6	8.8	8.6	12.2	7.6	8.8	4.7	4.5	5.0	5.4	7.2	8.1
	Urban	10.0	10.8	6.8	8.0	10.7	11.7	9.4	10.8	12.0	12.7	9.1	9.4	6.8	7.3	5.9	6.6	8.8	9.4
	Rural	5.5	6.0	4.8	4.8	8.4	8.7	5.5	6.4	8.1	10.5	6.5	7.1	3.8	4.1	4.5	5.2	4.8	5.3
Paraguay	*National*	6.2	7.7	5.5	5.5	7.7	9.7	7.2	8.9	7.5	9.2	6.1	7.9	4.1	5.3	4.7	5.3	5.3	6.4
	Urban	7.8	9.2	6.8	6.6	8.8	10.1	8.8	10.3	9.9	10.1	6.8	8.4	4.9	6.4	5.2	5.7	6.3	7.6
	Rural	4.5	5.9	3.9	5.3	6.9	8.3	5.4	6.5	5.6	6.6	5.3	6.5	3.7	5.1	4.3	5.2	3.4	4.5
Dominican	*National*	6.3	7.5	5.1	4.0	8.2	9.2	5.6	8.1	7.7	10.2	6.0	7.7	3.3	3.9	3.7	4.6	5.7	6.7
Republic	*Urban*	8.1	8.8	8.8	6.2	9.3	9.7	9.2	9.4	11.7	11.0	6.9	8.1	3.9	4.9	3.9	5.2	6.7	7.7
	Rural	4.3	5.1	3.2	3.6	6.9	7.3	3.8	5.5	6.6	7.5	5.3	6.5	2.8	3.4	3.5	4.4	3.4	4.3

[a] No information for Mexico on years of schooling around 2000.
Source: Agricultural Development Unit, ECLAC.

Chapter 4: Policies and Institutional Framework

Policies and Institutional Framework

This section contains an analysis of democratic governability to establish the current state of decision-making in the region. The Latin American and Caribbean (LAC) countries have undertaken efforts to promote family farming. They have revamped the institutional framework to make it more inclusive and tweaked their public policies to place greater emphasis on certain issues, including risk management, efforts to combat pests and diseases, climate variability, the promotion of research, technology transfer and water resources management.

In their quest for comprehensive solutions to major problems, countries are working to establish additional mechanisms to connect the public institutional framework with other stakeholders associated with agriculture, in an effort to strengthen their accountability, transparency and collaborative work.

Facts

- Most LAC countries have recognized that family farming offers a means to achieve the comprehensive growth of the agricultural sector promotes equity and drives development.
- Implementation of the European Union's Common Agricultural Policy and the United States' Agriculture Reform, Food and Jobs Act, better known simply as the Farm Bill, has a direct impact on LAC's political, economic and trade relations.
- With the stagnation of the World Trade Organization's Doha Round of negotiations, LAC countries have focused on signing and implementing regional or bilateral trade agreements.
- In several LAC countries, the institutional framework for agriculture has identified associativity as a key model to be implemented. Promotion of this approach will make it possible to strengthen different sectors, improve social inclusion and spur economic growth.

Trends

Countries look to family farming as the key to food security and rural well-being

Over the past year, several countries in the region have made the adoption of policies and instruments in support of family farming a priority of their decision-making agenda. **Bolivia** declared family agriculture an activity of national interest,[1] while **Argentina** has a bill designed to position it as a strategic sector. For its part, **Costa Rica** adopted the Sector Plan for Family Agriculture 2011-2014.

Support for this strategic sector has been accompanied by changes in national budgets. In 2013, **Chile** increased the budget of the Agricultural Development Institute by 8.2%, to enable the organization to step up its work with small-scale producers. Also in 2013, **Argentina** allocated 9.3 million Argentine pesos (USD 1.7 million) to promote and implement the registration of family farmers with the National Family Agriculture Register, and another 200 million pesos (USD 37.5 million)[2] to support two family farming production chains.

In 2013, Mexico began to implement the National Crusade Against Hunger[3] with the aim of ensuring the food security and nutrition of more than seven million Mexicans living in extreme poverty and guaranteeing the full exercise of their right to food. This social inclusion initiative promotes community participation and a coordinated inter-ministerial approach as the pillars of public administration.

In 2009, the MERCOSUR countries adopted Decree MERCOSUR/CMC/DEC. No. 006/09, in which they established rules for the Family Farming Fund. Over a five-year period, each member country pledged to make a fixed annual contribution of USD 15,000, plus a combined annual contribution of USD 300,000 divided up as follows: Brazil, 70%; Argentina, 27%; Uruguay, 2%; and Paraguay, 1% (MERCOSUR 2009).

Policy initiatives of this kind help ensure that the institutional framework for agriculture achieves objectives of major importance for society, such as social inclusion and greater access to opportunities.

The institutional framework has been revamped to adapt it to new challenges

Some countries in the region have become aware of the need to renew their institutional structures in order to make decision-making and public management more efficient, and to respond to the need for differentiated strategies for different territories, issues, sectors and stakeholders.

This has led to the creation of 'supra-ministries' and institutions responsible for coordinating cross-cutting issues, as well as agencies that coordinate the activities of all ministries in specific geographic areas under the rural area-based development approach, with a view to complementing and enhancing their efforts in pursuit of common goals.

This trend has been evident in a number of countries for some years.

1. In the Ley de Organizaciones Económicas Campesinas Indígenas y Originarias (OECAS) y de Organizaciones Económicas Comunitarias (OECOM).
2. These and other figures are based on the ERS exchange rate. May 2013.
3. Further information about the National Crusade Against Hunger is available at http://sinhambre.gob.mx/.

Box 10. Policies to promote inclusion and associativity in El Salvador: the Family Agriculture Plan (PAF) and Rural Entrepreneurship for Food and Nutritional Security 2011-2014.

El Salvador has been implementing the PAF since late 2011, with the aim of reducing rural poverty by generating wealth and well-being for more than 390,000 families, especially small and medium-scale producers. The PAF consists of four sub-programs: Food Security, Production Chains, Agricultural Innovation and Links with Industry and Trade.

According to El Salvador's Deputy Minister of Agriculture and Livestock, the program's success is due to the following elements: the design of specific strategies suited to the characteristics of the producer groups served; institutional strengthening; and effective communication and coordination among the various ministries, banks and other public and private institutions that support the sector, which has made for better coordination and integration of efforts.

International cooperation agencies, mainly the United Nations Food and Agriculture Organization (FAO) and the Inter-American Institute for Cooperation on Agriculture (IICA), have played a strategic role in implementing this program. FAO provided support to the Food Security sub-program, while IICA played a similar role in the Production Chains component.

Given the success of this program in El Salvador, IICA is supporting Mexico's National Crusade Against Hunger in applying aspects of the PAF experience in production chains, as an exercise in horizontal cooperation. This exchange of knowledge between the two countries is permitting the rapid dissemination of innovations and effective methodologies, which can be adjusted and applied in different areas. This approach opens up a number of training opportunities for technical personnel and producers.

Source: prepared by the author based on information from IICA, FAO and Ministry of Agriculture of El Salvador.

- Since 2001, **Mexico's** Special Concurrent Program for Sustainable Rural Development has implemented cross-cutting public policies targeted at rural areas. According to data from the Mexican Chamber of Deputies, the program had a budget of 313,789,800,000 Mexican pesos (USD 24,743,510,000) in 2013.

- In 2007, **Ecuador** created 'coordination ministries,' whose status is higher than that of traditional ministries. Their role is to coordinate actions in key thematic areas to avoid duplication of efforts. The idea is to make government programs more efficient and improve the implementation of public policies.

- The Territories in Progress Program, created in **Brazil** and replicated in **El Salvador,** was designed to coordinate the poverty reduction efforts of different ministries. In 2013, the Salvadoran government invested USD 150 million in the coordination of public administration and social management initiatives in rural communities.

In 2012-2013, the work of creating or reorganizing ministerial structures continued:

- **Nicaragua** created a combined Ministry of Family, Community, Cooperative and Associative Economies, merging the portfolios and spheres of action of the former ministries of Economic Affairs, Agriculture and Social Development.

- **Peru** set up the Ministry of Inclusion and Social Development, with the aim of harmonizing the policies of various sectors (including agriculture) and levels of government (adopting the area-based development approach).

- **Guatemala** established the Ministry of Social Development, with an emphasis on poverty reduction in rural areas, im-

plementing mechanisms for coordination and cooperation with other central government agencies.

- **Chile** expanded the coverage of its Ministry of Agriculture, now renamed the Ministry of Agriculture, Fisheries and Food, giving it responsibility for food (quality and safety, formerly under the authority of the Ministry of Health) and fisheries (previously under the authority of the Ministry of Economic Affairs).

Some LAC countries have shifted the focus of their ministerial portfolios, targeting a number of critical cross-cutting aspects of agriculture. **Peru** reorganized its Ministry of Agriculture and renamed it the Ministry of Agriculture and Irrigation. **Costa Rica** created the Under-ministry for Water and Seas, a division of the Ministry of Environment, Energy and Telecommunications. In **Mexico,** the Under-secretariat for the Promotion of Agribusiness became the Under-secretariat for Food and Competitiveness.

Other types of institutions have emerged in response to this need for close coordination of efforts, but without necessarily having ministerial rank. In 2012, **Bolivia** established the Plurinational Council for Agricultural and Forestry Innovation to promote technology innovation policies, allocating it a budget of USD 52.6 million for the next five years. This commission coordinates different ministerial portfolios and includes stakeholders from the production and private sectors.

Public policies with a new emphasis

The LAC countries have addressed many challenges by adopting policy measures to protect the agricultural sector. Public decision-makers in the region have paid particular attention to efforts to combat pests and diseases and to climate variability, with an emphasis on droughts and floods.

At the beginning of 2013, the heads of state of the Central American Integration System (SICA) agreed to join forces to combat coffee leaf rust and support regional and national strategies through specific policies. The policy measures applied by countries included the establishment of trust funds (**Costa Rica**) and the provision of seeds (**Guatemala**), agrochemicals (**Costa Rica and Guatemala**) and leaf fertilizers and manual spraying equipment (**El Salvador**). Some countries (**Guatemala, El Salvador, Nicaragua and Costa Rica**) are considering offering credit, while others have made adjustments to loans already taken out by coffee growers (**Costa Rica**).[4]

To address climate variability, **Uruguay** invested over USD 10 million at the beginning of 2013 in an effort to adapt its production systems to climate change, particularly drought. Under this initiative, the government gave priority to small-scale producers, considering their greater vulnerability. That same year, the Chamber of Deputies of **Chile** approved an amendment to establish a new Permanent Committee on Water Resources, Desertification and Drought. Chile's Secretariat of the Environment and Natural Resources created a permanent Inter-secretarial Commission to deal with droughts and floods.

In **Central America**, the Regional Committee on Water Resources has recognized the link that exists between agriculture and climate variability. One of the activities organized around this issue during the 2012-2013 period was the Nineteenth Forum on Applications of the Central American Climate Outlook to Food and Nutritional Security, which focused on the relationship between food security and the crisis in coffee production triggered by the outbreak

4. Further details concerning the impact of coffee rust disease in Central America are included in the chapter on Context of the Agricultural Sector.

of coffee leaf rust. In this context, work has been carried out to develop climate risk scenarios for each sector, including agriculture.

In the **Caribbean** countries, decision-makers have addressed this issue by focusing on water management for agriculture and efforts to improve overall productivity through innovation and efficient use of resources. More specifically, **Barbados** and **Grenada** have conducted preliminary studies on the green economy, in which agriculture is included as an essential sector.

Certainly, governments have been forced to incorporate strategic issues on their agendas in order to implement prompt, timely and inclusive solutions for agriculture.

Bartering of food for oil as a form of commercial exchange

Initiatives involving the exchange of food for oil have gained ground in the region, particularly under the aegis of the ALBA and PETROCARIBE. According to figures from the 2012 Management Report of Petróleos de Venezuela (PDVSA), **Nicaragua** has led the way in paying off its oil debt to Venezuela, exporting 496,389 metric tonnes of foodstuffs to pay for the 11.8 million of barrels of oil acquired that year, in a commercial transaction worth USD 713 million. This figure was substantially than in 2011, when it totaled USD 372 million.

That same year, **Guyana** sent Venezuela 212,284 metric tonnes of food, mainly rice; and the **Dominican Republic**, 15,996 metric tonnes of liquid sugar and food pastes. The two countries have increased their commercial exchange by offering food in place of money, covering 26.4% and 4.2% of their oil bills, respectively, according to PDVSA figures.

At the same time, some South American countries have begun to establish relations with African countries through the implementation of food barter programs. In this context, **Uruguay** and **Argentina** have forged closer bilateral ties with Angola, with the aim of supplying the African nation with water and food in exchange for oil.

Although some LAC countries are adopting food for oil programs as a form of commercial exchange, these still make up a very small proportion of the region's food trade; hence, the absence of official trade figures or data.

Prospects

Innovation will be strengthened along with research and technology transfer

The LAC countries have acknowledged that innovation, research and technology transfer are key to increasing not only economic growth, but also social well-being in the region. There are both embryonic and consolidated initiatives in this regard and, in the near future, countries are expected to become increasingly interested in strengthening initiatives of this kind and allocating budgetary resources.

Argentina, which had the second most mechanized agriculture in the world in 2012, will remain in the forefront. In 2013, it will execute a USD 200 million loan from the Inter-American Development Bank (IDB) to finance new centers offering technology services, more than 1500 research and innovation projects and the training of 700 professionals abroad.

Some **Caribbean** countries are in the process of adopting a model of climate-smart agriculture, under the Caribbean Agro-meteorological Initiative, which will provide them with more accurate information on weather and

Box 11

Relations between China and Latin America

The focus of the first meeting of the China-LAC Forum of Agricultural Ministers, which took place from June 8-9, 2013, was mutually beneficial cooperation for win-win development.

During this event, the ministers approved the Beijing Declaration, with a view to improving conditions in agriculture in both latitudes.

A number of agreements were reached in the area of research and development, including the following: implement joint agricultural technology programs; strengthen cooperation on scientific research and technology development in agriculture; and conduct joint research in the areas of production and improvement of crop varieties, agricultural biotechnology, livestock production, aquaculture, prevention and control of animal and plant diseases, farm mechanization and processing of products.

Source: Beijing Declaration 2013.

climate in order to improve decision-making on agricultural production. The Caribbean countries are also tackling the problem of climate variability by promoting agriculture in controlled environments (particularly greenhouses).

The U.S., Canada and **Brazil** will continue to strengthen their regulatory frameworks with a view to tightening controls over intellectual property. In this regard, obtaining and protecting patents based on biodiversity elements and germplasm will be a key issue, both in the national and the regional spheres.

In the **Southern Region**, the **Specialized Meeting on Family Farming (REAF)** is actively promoting policies to help small-scale producers in the MERCOSUR countries gain access to appropriate technologies, which will remain a priority on the decision-making agenda.

This process is of special importance to family agriculture. In April 2012, the Forum for the Americas on Agricultural Research and Technology Development (FORAGRO) conducted an online consultation on technology and innovation in family farming in LAC with IICA's support. The survey findings suggest that the current aggregate supply of technology is usually insufficient to meet the explicit and implicit technology demands of family agriculture. On the one hand, family farmers know what their needs are but have limited incomes and resources and are not equipped to access new technological knowledge. On the other, technology providers, mostly from the private sector, have the technical capacity to meet the demands of farmers but do not always maintain close communication with them in order to identify and develop technologies that are appropriate to their specific needs (based on environmental and productive conditions). Nor do governments provide incentives to encourage them to do so.

This situation is expected to improve in the near future and links between providers and consumers of technology will be strengthened, particularly in family agriculture, as shown in Text Box 12.

Public-private cooperation will be strengthened to manage risk in agriculture

The LAC countries have come to recognize the private sector as a strategic ally, since it has been shown that public-private linkages improve the terms of trade for family agriculture.

Public agricultural institutions are expected to provide greater support to small and medium-scale farmers to help them comply with the

Box 12.

Innovations with a beneficial impact on family farming: the importance of working together.

A recent study by the Regional Fund for Agricultural Technology (FONTAGRO) documented high-impact innovations in LAC that have benefited small-scale producers by making their labor more productive and competitive, thus allowing them to build more value into their native products, raise prices and improve incomes and living standards. In large measure, the success of these experiences has been due to the interaction and combined effort among the various stakeholders.

Public-private coordination. One of the experiences described in the study was Ecuador's fine aroma cocoa production. In this example, collective innovations were adopted by coordinating the work of scientists, agricultural technicians and small-scale farmers, thus meeting various technology needs on family farms, moving small-scale producers into value chains and making their products more competitive. Another case study, on the production of native potatoes in Ecuador, expanded these partnerships over the longer term by means of contractual arrangements.

Participatory work. Inclusive, competitive, associative and sustainable models have been adopted, such as the organization of small-scale bee producers in Argentina and Dominican Republic or the participatory approach to production chains applied to Andean potatoes in Peru. These initiatives showcase participatory work by research-plus-development (R+D) teams and area-based networks of technical specialists, which facilitates the identification of new business opportunities, development of rules and standards, sustainable uses of biodiversity and the development of production clusters to benefit family farming.

Participatory research. The examples of improved forage and a better environment in the understory of the Chaco forests in Salta, Argentina and native potatoes in Cundinamarca, Colombia, show opportunities being created for researchers and family farmers to share modern knowledge and traditional wisdom. Family farmers were equipped with effective technology to meet their needs and to strengthen family organization on the farm.

Skills Building. The case of native potato crops in Cundinamarca also shows that when small-scale producers build their skills (for example, by adopting new technologies for crops and building organizational and business acumen), the process is even more successful.

Source: IICA's Innovation Program based on IICA and IDB 2013.

standards demanded by the private sector (e.g. marketing firms and retailers) in international markets. This type of alliance is already evident in chains aimed at the international market.

Similarly, the LAC countries will seek to strengthen collaborative work between public institutions and the private sector, in order to design solutions that take into account the supply and demand for technology.

These public-private efforts will place emphasis on the need to promote agricultural insurance. According to a study conducted in 2012 by IICA and the Latin American Association for the Development of Agricultural Insurance, 75% of LAC governments currently attach great or very great importance to the issue of risk management. However, the region accounts for only 3.5% of agricultural insurance premiums worldwide. This situation reflects a lack of

interest on the part of insurers, due mainly to climate variability and its potential effects on agriculture. In this context, governments will endeavor to create stability by providing the insurance sector with resources and vital agricultural and meteorological information, while the private sector will contribute its knowledge and assume –either totally or partially– the risks in a context of greater security with clear and permanent game rules.

In order to address these types of issues, governments will increasingly work to generate synergies among the stakeholders of agricultural institutions, creating opportunities and linkages to propel the efforts of different actors and resolve public problems of national interest.

Accountability processes will be intensified

Accountability mechanisms and strategies to make governmental information more transparent will be strengthened in support of efforts to improve the agricultural sector.

As part of the principles of modern public administration, the decentralization of decision-making and the growing interest of citizens, most countries in the region have established annual accountability processes designed to inform society about the challenges already addressed and those that lie ahead.

Accountability processes have traditionally taken the form of meetings at which the accountability body issues a statement or a report. In the years ahead, these processes will be further strengthened through closer contact with citizens and the use of information and communication technologies.

Increasingly, the ministries of agriculture are using social networks as a means to offer continuous accountability regarding their work and as a mechanism for dialogue with citizens. This approach will become part of routine accountability processes in the near future.

Transparency will be increased by making open government a cornerstone of public administration

In 2012, the G8 leaders acknowledged that open access to official information on agriculture (open government) was vital to increase global food security. International agencies have also become involved in this process, which will gradually include the private sector and non-governmental organizations.

Countries like Chile, Brazil, Mexico, Paraguay, Costa Rica, Colombia, Honduras and Uruguay have taken the first steps toward what is referred to as open data for more inclusive economies. At the beginning of 2013, **Chile** promoted the first Regional Meeting of the Open Government Partnership, organized and hosted by the Economic Commission for Latin America and the Caribbean (ECLAC). The event facilitated dialogue among leading stakeholders from the region and across the globe on the potential of open data. Among the most important experiences so far is **Colombia's** design of applications that include data on agriculture and rural development. Similarly, in June 2013 **Uruguay** hosted the Regional Conference on Open Data for LAC, whose theme was "promoting the generation of value." During this event, delegates discussed the economic and social value of open data, together with the lessons learned and future challenges facing the region in this area.

In 2013, the **Caribbean** countries also held their first conference on open data, which is viewed as a catalyst for regional development. In addition, national meetings were organized to discuss solutions to specific problems in sectors such as agriculture and trade (De la

Cruz 2013) based on the use of open data and software development.

The benefits of implementing open data strategies for decision-making are considerable. This underscores the need to facilitate citizens' access to public data, enabling them to make a significant contribution to the design of public policies, monitor their implementation and generate sustainable social transformation processes.

The countries that have taken their first steps toward open government will further strengthen their endeavors in this area, while those that have not yet embraced this approach to public administration will do so in the near future. This practice will gradually permeate the agricultural sector, providing key information to the stakeholders who make decisions on agriculture.

Water as a key issue on the decision-making agenda

Water and agriculture are inextricably linked. It is estimated that more than 75% of water resources are used for agricultural activities. Governments are paying greater attention to the challenge of finding ways to use water more efficiently in agriculture, in order to preserve this resource and at the same time boost the sector's productivity.

Establishing public policies that improve efficiency in water management will be a priority for decision-makers in the years ahead. The countries that have suffered droughts in the recent past are looking at innovation processes that will enable them to improve their irrigation systems and water management in order to guarantee supplies throughout the year.

Efforts to design policies that will make water management more efficient will be accompanied, in some cases, by the strengthening of family farming. At the Meeting of Ministers of Agriculture of the Americas, held at the end of 2013 in **Argentina,** the ministers discussed and addressed key aspects of the relationship between water and agriculture as a strategic resource in the agricultural and rural sector. The conclusion reached in the discussions was that national budgets would have to be restructured in the near future to finance water resource management policies.

Public policies to reform land tenure will continue to be a priority issue in the countries

With land becoming an increasingly scarce factor of production, many countries have been adopting policy measures, a trend that will continue for the foreseeable future. Most decisions taken on this matter go hand in hand with support for family agriculture and the strengthening of local production.

In Latin America, the Agrarian Commission of the **Peru's** Congress is currently working on a bill called Law 763/2011-CR, which is intended to limit land tenure and thus ensure more equitable development of the agricultural sector, given that 40% of Peru's farmland is owned by 34 powerful groups. In **Argentina**, Law 26737, the System for the Protection of the National Ownership, Possession and Holdings of Rural Land entered into force at the beginning of 2012. The Ministry of the Interior says that, among other measures, this law imposes limits on foreign ownership or possession of land in rural areas. **Brazil** has also made progress on land issues and has limited land purchases by foreigners and Brazilian firms with foreign capital through a reinterpretation of the existing regulations. In mid-2013, **Uruguay** announced that it was preparing a draft bill to prevent foreign states from purchasing land.

Box 13
Responsible governance of land tenure.

In 2012, the Committee on World Food Security (CFS) approved a number of voluntary guidelines on responsible governance of land tenure, with the aim of supporting governments in the task of safeguarding people's rights to property and access to land. The agreed guidelines include:

- Recognition of and respect for legitimate land tenure rights, even in informal systems.
- Best practices for the registration and transfer of land rights.
- Assurances that systems for the administration of land tenure are accessible and affordable.
- Management of expropriation and restoration of land to persons forcibly evicted in the past.
- Rights of indigenous communities.
- Responsible and transparent investment in agricultural land.
- Mechanisms for settling disputes over land rights.
- Measures to address the encroachment of cities into rural areas.
- Valuation and taxation issues

Source: FAO 2012

Agrarian policy has been one of the main issues under discussion in the peace process involving the Government of **Colombia** and the FARC rebels, with emphasis on the problem of the accumulation of land. After six months of negotiations, in May 2013 the two parties announced that they had signed an agreement aimed at transforming the countryside in Colombia. Among other issues, the document focuses on smallholders, access to and the distribution of land, and efforts to stimulate agricultural production and the solidary and cooperative economy.

More and more countries are seeking to reform their land tenure systems to benefit small-scale agriculture and acknowledge its essential role in the economy. For many, the challenge in 2014 will be to implement the policies adopted during the previous year, and to complete land-titling processes, particularly in family farming communities.

Policy Recommendations

Effective implementation of policies and citizen participation

Most countries in the region have taken the important step of moving toward the adoption of a medium- and long-term approach where the design of policies is concerned. In policymaking processes for agriculture, it is increasingly common for the different ministries to work together in pursuit of comprehensive solutions based on different viewpoints and approaches.

However, one of the main concerns continues to be how to implement public policies effectively. Three key elements are required to accomplish that objective: the allocation of budget resources, the definition of responsibilities and citizen participation.

In relation to the first point, when countries adopt public policies it is important that they support them with policy instruments and budget resources. Where such instruments already exist, it is only necessary to align them with the proposed new policy. If instruments need to be created, additional funds have to be allocated for that task. In addition, it is essential that governments promote inter-institutional coordination in order to avoid duplication of efforts and make the state apparatus more efficient. This issue is key in the agricultural sector, given that there are cross-cutting issues for which the ministries of agriculture are not always directly responsible.

The other essential aspect of successful implementation is the need to secure active citizen participation in the policymaking process. Agriculture sector stakeholders are increasingly interested in taking part in the design and implementation of policies. This interest is valuable for governments because it ensures that the policy objectives adopted are embraced by stakeholders outside the public institutional framework. This permeates the agricultural sector and results in public policies that are sustainable over time and less likely to be affected by changes of government.

Sharing of experiences through the creation of citizen participation mechanisms

It is important to encourage the dissemination of successful participatory experiences that are being implemented in other latitudes, so that the LAC countries can take advantage of them to strengthen their own initiatives. The exchange of experiences could promote synergies between countries and encourage the adoption of innovative approaches to citizen participation aimed at the growing inclusion of family farming.

These actions should be carried out bearing in mind that every country has different ways of fostering citizen participation. Some of the tools that could be considered include participatory budgets, roundtables for dialogue, scenario-based planning workshops, sectoral meetings, local councils for citizen participation, transparent government programs, the use of social networks and public consultations (referendums, plebiscites and town hall meetings).

Cross-cutting issues such as youth, gender and indigenous populations should be included in national policies to promote family agriculture

Efforts are needed to ensure that public policies for the agriculture sector become more inclusive:

- Rural women produce nearly half of the food consumed and play a key role in family farming and food security (Ballara and Damianovic 2010).

- The region has 671 indigenous peoples, most of whose members are involved in agriculture (Ballara and Damianovic 2010).

- According to figures from the United Nations Food and Agriculture Organization (FAO), there are 1.2 billion adolescents in the world; nine out of ten of them live in developing countries and 55% in rural areas.

Public policies for the development of FA adopted in the near future must be accompanied by inclusive policy instruments that make provision for an agriculture sector that will be increasingly urban, incorporating elements that help to retain young people in the sector (such as the use of information and communication technologies). Differentiated strategies are also needed that take into account the specific situation of women farmers and indigenous peoples. Mechanisms for the participatory construction of public policies adapted to the circumstances of these vulnerable segments of the population are a key factor if the strategies designed are to be inclusive and respond to the needs of the target groups.

In the area of organizational management, associativity processes involving producers'

organizations and cooperatives have proven effective in strengthening the position of farmers, particularly marginalized groups such as women, youth and indigenous peoples (FAO *et al.* 2011). Government support for and the strengthening of organizations of this kind are vital.

Strategic thinking and prospective analysis

In order to provide a timely response to the challenges facing agriculture and chart the course to be followed in the medium and long terms, it is essential that public institutions cease basing their analysis on past trends and undertake prospective analysis.

Prospective analysis is a holistic process that calls for open and participatory mechanisms, as well as collective discussions and networking, to determine the actions that need to be taken.

Some countries –**Uruguay, Mexico, Brazil and Chile** among them– are currently conducting analyses of this nature, with a view to shaping the societies that they wish to see in the future, and to meet future challenges (Vizcaya 2011). For example, when restructuring its ministry of agriculture, Peru established the Deputy Ministry of Agrarian Policy, which will play a strategic role in coordinating and evaluating policies for this sector.

However, the efforts related to the institutional framework for agriculture are insufficient. Investment in training of public sector officials to conduct this type of analysis will ensure that policy measures focus on strategic elements that are priorities for the country and not only on short-term or emergency elements.

Conclusions

The region must deal with elements of uncertainty and many variables in decision-making. This challenge has prompted governments to redefine their priorities, modernize their institutional frameworks and place emphasis on aspects that maximize the impact of public, area-based and sectoral actions. In this process, family farming has become part of a cross-cutting strategy in the fight against poverty and food insecurity, which many LAC nations should pursue.

In attempting to find solutions to the region's most pressing problems, it will be essential to create mechanisms for dialogue and public-private partnerships for the collective construction of public policies. It will also be necessary to unite efforts to define clear operational strategies in order to turn good intentions into concrete actions.

Many challenges remain to be overcome in the region: social inequality, food security and the efficiency of state institutions. All the LAC countries will have to address these challenges in the coming years. However, each nation must develop its own formula for tackling its most pressing public problems, one that incorporates successful experiences and lessons learned from other latitudes, reflects the national political culture and includes the sustainability and implementation mechanisms required to put it into effect.

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Chapter 5: State of and Outlook for Family Agriculture in Latin America and the Caribbean

1.1. Introduction

In Latin America and the Caribbean (LAC), agriculture operates against a complex backdrop of unstable prices of agricultural products and inputs, competition with other productive sectors for the use of natural resources, growing demand for food and, in some countries, a heavy dependence on food imports, which could lead to difficulties in supplying domestic demand. As a result, family agriculture (FA) is seen as the economic activity with the greatest potential to help resolve those problems in the region. The development of the sector calls for efforts to increase the food supply and reduce levels of unemployment, poverty and malnutrition among the most vulnerable rural dwellers in LAC.

The concept of family farming extends beyond mere agricultural production and is defined rather as a livelihood that respects the environment, safeguards biodiversity, protects cultural traditions and promotes area-based development (*desarrollo territorial*). However, in most countries of the region, for a number of reasons –particularly the lack of specific information on the sector and the absence of public policies aimed at resolving its structural problems– FA has remained largely invisible and, therefore, its contributions are unknown or undervalued by society.

Even though its potential is unquestionable, FA faces more productive, business-related and socioeconomic constraints than almost any other sector in LAC. The size and quality of its production resources are limited, and the region has few mechanisms to promote access to land and water. Limited access to technology and capital, low generational change, asymmetries and inequalities stemming from the free trade agreements and poor adaptation to the effects of climate change are some of the other variables that, taken together, point to a discouraging outlook for FA in many LAC countries unless urgent actions are taken to develop the sector in the short term. By promoting family farming, countries would be able to take advantage of the productive, economic and social benefits associated with development, and make progress toward achieving equality, inclusion and an appreciation of the sector's real importance by society.

This document seeks to contribute to knowledge of family agriculture by offering a description of the sector in the three main subregions of LAC, and an analysis of the constraints and challenges that it faces and the future outlook, and recommendations for public policies to facilitate its development and sustain it over time.

1.2. Characterization

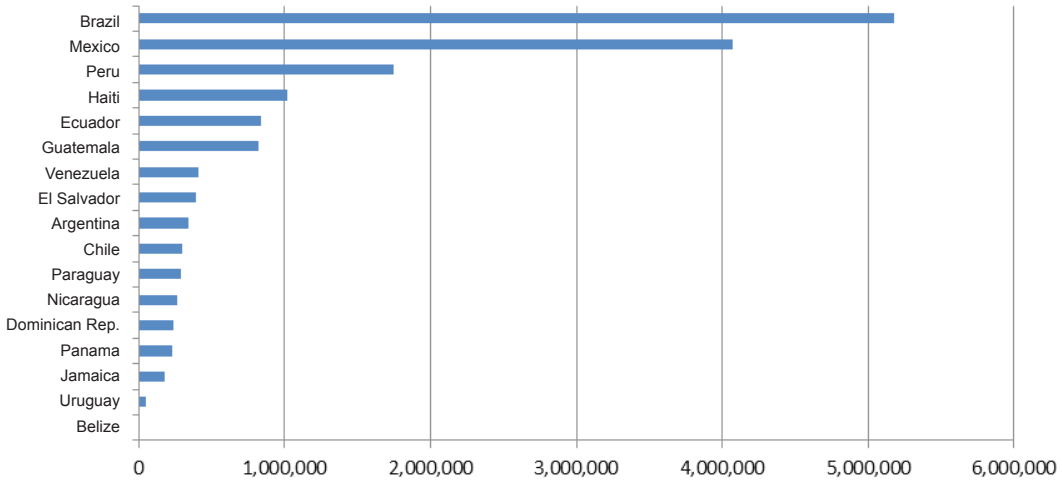
1.2.1 Size of the sector

The FA sector in LAC is comprised of an estimated 17 million farms, on which around 60 million people work and live. An estimated 57% are in South America (Figure 20). In most cases, the quantification of FA in agricultural censuses is based on a stratification of the size of the farms surveyed. In some countries, studies have been carried out using other variables, such as the gross value of production. Beyond these approximations, it is estimated that FA accounts for more 75% of the total number of production units in almost all the Latin American countries, and more than 90% in many of them.

1.2.2 Contribution made by FA to agricultural production

Table 17 shows that, in every case, family agriculture in South America accounts for more than 20% of the sector's production, with its contribution reaching around 40% in several

Figure 20. Total number of farms in 17 Latin American countries



Source: Namdar-Irani, M., 2013, based on the latest agricultural census of each country.
Note: In the case of Mexico, the figure refers only to active farms (the total number is 5.5 million).

countries (Brazil, Colombia and Ecuador). FA's share of employment in the sector is particularly significant. In the countries analyzed, it ranges from 36% (Costa Rica) to 76% (Honduras).

Although FA clearly accounts for by far the largest number of farms in the region, the same is not true of the acreage of farmland in the hands of family farmers. In most countries

Table 17. Contribution of family agriculture in some Latin American countries

	Argentina (d)	Brazil (c)	Chile (b)	Colombia (c)	Ecuador (c)	Paraguay (a)	Uruguay (a)
Importance of sector							
FA's share of value of sector production (%)	19.2	38.2	22	41	45	s.i	s.i
FA's share in sector employment (%)	53	74.4	61	57	s.i	s.i	s.i
Farms	(a)	(e)					
No. of family farms (thousands)	251.1	4367.9	254.9	737.9	739.9	264.8	32.6
Family farms as percentage of all farms	75.3	84.4	95.0	87.0	88.0	91.4	57.2
Surface area	(a)	(e)					
Average area of FA (ha)	142.0	18.4	17.0	3.0	7.0	7.4	77.2
Average total area (ha)	593.0	63.7	38.0	4.6	14.7	107.0	287.0
FA as % of total surface area (%)	20.3	24.3	44.0	57.0	41.0	6.3	15.4

	Costa Rica (e)	El Salvador (e)	Guatemala (e)	Honduras (e)	Nicaragua (e)	Panama (e)
Importance of sector						
FA's share of value of sector production (%)	40.6	42.7	49.0	56.5	49.3	58.3
FA's share in sector employment (%)	36.0	51.0	63.0	76.0	65.0	70.0
Farms	(f)	(f)	(f)	(f)	(f)	(f)
No. of family farms (thousands)	79.0	230.0	1062.0	484.0	334.0	164.0
Family farms as percentage of all farms						
Surface area						
Average area of FA (ha)		2.2	1.0		6.7	
Average total area (ha)						
FA as % of total surface area (%)						

Source: Namdar–Irani 2013, based on:
(a) Agricultural censuses in Argentina (2002), Brazil (2006), Paraguay (2008) and Uruguay (2000), cited in REAF 2010:12
(b) Qualitas Agroconsultores 2009
(c) FAO-IDB 2007
(d) Obschatko et al. 2007
(e) Household surveys in Guatemala (2006), El Salvador (2006), Honduras (2006), Nicaragua (2005), Costa Rica (2007) and Panama (2003)
(f) Agricultural censuses in Guatemala (2004), El Salvador (2007), Honduras (1993), Nicaragua (2001) and Panama (2000).

for which data is available, the figure never reaches 60%, ranging from 6.3% of the total in Paraguay to 57% in Colombia. In addition, family farms contribute less than 50% of the value of agricultural production in most of the countries studied, highlighting the productivity problems that characterize this sector (ECLAC *et al.* 2013).

Nevertheless, FA plays an important role in supplying basic foodstuffs for the countries of the region. In Brazil, for example, FA accounts for 87 % of production of cassava, 46% of maize, 70% of beans, 58% of milk and 59% of the pigs raised. In Argentina, FA accounts for 82% of the national goat herd, 64% of the pig herd, 33% of the dairy herd and 26% of the livestock raised for meat and wool. In Paraguay, this sector produces 97% of tomatoes and 94% of cassava and beans (Olascuaga 2013)

1.2.3 Dynamics of structural change in agriculture

Latin American agriculture is characterized by the coexistence of small family-run farms and medium-sized and large-scale production units, a factor that has created a very heterogeneous and unequal agrarian structure. The evolution of that structure in Latin America has been influenced by two trends: in some countries, sectoral dynamics have resulted in ownership of land being concentrated in fewer hands, which has meant a reduction in the number of farms, especially the smallest ones. In other

countries, the opposite has occurred, with land being increasingly fragmented and broken up into ever-smaller plots.

The first group of countries includes Argentina, where the number of farms decreased by 20.8% between 1988 and 2002 (INDEC 2009). A similar trend is evident in Brazil, where the total number of farms fell by 10.7% between 1985 and 2006 (IBGE 2006). The same situation is evident in Chile, based on hfigures from the last Agricultural and Forest Census (2007), which show a 6.4 % drop in the total number of farms registered (INE 2007). In Uruguay, no data is available on the current state of the agrarian structure; however, previous studies show that the number of farms declined from 86,928 in 1961 to 57,131 in 2000. Farms smaller than 99 hectares in size made up around 96% of the total (Piñeiro 2011). Considering the dynamic nature of the land market, this trend is expected to increase, favoring medium and large-scale agricultural enterprises that purchase land from family farmers.

The second group of countries includes Mexico, where the number of production units increased by 7.8% between 1991 and 2007, with registered farms climbing from 3.8 to 4.1 million (INEGI 2007). This category also includes Peru, where, according to the latest National Agricultural Census, the number of farms increased from 1.7 to 2.2 million, with 496,000 additional production units (INEI 2013). The same trend is observed in Jamaica, Antigua and Barbuda, and St. Kitts and Nevis, where farms have become progressively fragmented. In Jamaica, the division of properties has reached extreme levels: between 1996 and 2007 there was a 9.8% increase in the number of farms less than one hectare in size, which account for 66.4% of the total. The number of landless farmers has increased by 90%, equivalent to 12.3% of the total farming population.

The pressure created by *minifundización* (the division of land into smaller plots) leads to more intensive soil use, followed by soil degradation and a decrease in food production. This situation is probably repeated in other countries of the region, although no data is available to validate the hypothesis.

In this context, a study conducted in Brazil poses an inevitable and urgent question:

> *Do the rural poor still have any chance of continuing as farmers? Any objective analysis of the economic processes that have intensified in recent years, the ever-increasing competition, the growing technology gap among producers and the decisive presence of the total productivity of factors for some, but not for the majority, makes for depressing reading. If these comparative differences among rural producers were to be associated with a reasonably high level of national performance and economic growth, which would increase urban employment opportunities, it would be possible to predict, without a significant margin of error, a rapid depopulation of the countryside and the continued population exodus that has been typical of rural areas in the last fifty years (Navarro and Kanadani 2013).*

This question can only be answered satisfactorily if we acknowledge that the structural dynamics of regional agriculture must influence the design of public policies. Finding solutions to the problem of land fragmentation should form part of a comprehensive strategy for overcoming poverty in the countries. This is a complex challenge that requires an extra-sectoral approach that combines and coordinates national efforts to achieve the inclusive development of this sector. At the sectoral level, programs must be implemented to provide access to land, while incentives for its sustainable use must offer the necessary support to help mitigate the negative effects of these trends on the sustainability of FA in the region.

1.2.4. Heterogeneity of FA

All the studies of FA that have been conducted in the region underscore its heterogeneous nature. Major differences are observed in the subsector in terms of the base of productive resources, infrastructure and capital available, and access to public goods and services. These factors, in turn, make for heterogeneity in terms of potential, production and consumption structures, capacity for innovation, share of labor markets and strategies for diversifying sources of income. This undoubtedly complicates any analysis of the sector, and has resulted in a conceptual definition of certain typologies of producers to facilitate the design of policies and programs suited to the development needs of the main segments that comprise this sector. The typology designed by FAO-IDB (2007), widely recognized and adopted in the region, identifies three groups of farmers within FA:

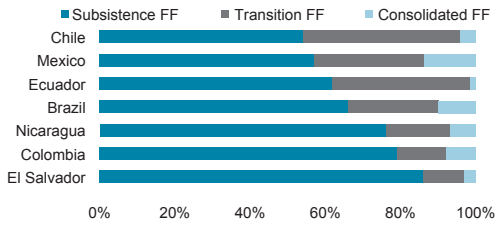
- **Subsistence family farmers:** produce for their own consumption, with insufficient productive resources and income to ensure the reproduction of the family unit, leading family members to turn to paid labor, other non-agricultural activities or migration in order to supplement their income.

- **Transition family farmers:** also produce for on-farm consumption, or for sale, with sufficient productive resources to meet family needs but without the capacity to generate surpluses for the development of the farm.

- **Consolidated family farmers:** self-sustaining production, exploit land and resources with greater potential, have access to markets (as well as technology, capital, inputs) and accumulate enough surpluses with which to capitalize the production unit.

The study estimates that over 60% of family farms belong to the subsistence category, 28% to the transition category and just 12% to the consolidated category. These proportions vary from country to country but, in every case, subsistence agriculture is the category with the largest number of farms (Figure 21).

Figure 21. Distribution of the three major types of family farmer, by country



Source: Prepared by IICA, based on Maletta 2011, and FAO and IDB 2007.

These differences in access to the factors of production, together with the milestones that mark the history and evolution of families (establishment of young farmers; marriage, raising of children; departure of children; preparation for retirement) (Bourgeois and Sebillote 1978) give rise to different production strategies to cope with the uncertainties of a life in agriculture and enable farmers to sustain themselves over time. This approach is possible because these farms have various types of resources and use them in a flexible way, adapting to each moment and to each situation. Their most important resource is the workforce, which plays a key role in generating off-farm income and ensuring the family's economic stability. However, these farms also have land resources and capital, as well as business capabilities that allow them to apply a wide range of individual and collective strategies (Table 18). This fact calls for a new generation of public policies, which should focus on developing farmers' capabilities and promoting their autonomy, applying an

Table 18. Strategies for change applied on family farms

Strategy	Description
Specialized production	Expansion of the industrial model of agriculture geared to production, based on traditional agricultural products grown on the farm. Optimization of production systems by expanding the scale of production (purchase or leasing of land) or through technological innovations applied to products historically produced on the farm.
Diversification of agricultural production	Incorporation of new products into the agricultural system that, in addition to traditional products, make it possible to diversify risk or improve profits.
Modernization of agricultural production	Reutilization of farm resources to create new agricultural products on the farm. Partial or total substitution of traditional products with new crops or livestock to improve farm profits.
Rural non-agricultural income (RNAI)	Reutilization of farm resources to create new non-agricultural products on the farm: rural tourism (camping, accommodation, restoration projects, other), crafts, trade, environmental services and others.
Rural non-agricultural employment (RNAE)	Part-time agriculture and reutilization of farm resources for off-farm uses. Other remunerated activities by the head of the farm or family members that generate part of family income.
Reduction of agricultural activity	Maintaining the traditional production model and reducing the level of activity on the farm. Reduction of area used for agriculture, leasing out or sale of some land.
Search for new lifestyle	Evolution toward hobby or semi-retirement farming. Sale or leasing out of part of land owned, or use for conservation purposes. Residential use.
Abandonment of agriculture	Withdrawal from agricultural activities. Sale of farm or transfer to next generation, fragmentation/sale.

Source: Sotomayor *et al.* 2013.

integrated and intersectoral approach.

1.2.5. Constraints and challenges

In Latin America, FA operates in less favorable social, economic and productive conditions than many other activities. The same constraints affect FA throughout the region, albeit with differences between countries. In socioeconomic terms, it is one of the sectors with the highest levels of poverty, food insecurity and illiteracy. Generational change is minimal.

In productive terms, there is absolute consensus regarding the technology and productivity gaps that affect FA compared with commercial-scale agriculture. There are several reasons for this, but the main ones include:

- FA production resources tend to be located in areas with poor quality soils for agriculture.
- Lack of access to land of sufficient size and quality to develop the sector.
- Degradation of the production base, which means that the sector is more vulnerable to the effects of climate change.
- Family farmers have limited access to technology, credit and services for production.

- Difficulties in accessing markets.

- Lack of infrastructure.

To this must be added the limited public investment in rural areas and the absence of a specific institutional framework to promote the sector's development. In this context, is it important to note that the region's technical assistance programs are inadequate in terms of quality and coverage, which hinders capacity building and efforts to incorporate new productive activities into this sector.

These constraints underscore the difficult context in which FA operates. Overcoming these limitations will necessarily require the effective support of governments; otherwise, the sector's most vulnerable segments will inevitably disappear.

1.2.6. Potential

FA is an economic activity that not only combines its production resources more efficiently but also does so in a more sustainable and equitable manner. Moreover, because it is labor intensive rather than technology intensive, it plays an important role in the redistribution of wealth and the reduction of poverty. The FA sector has the potential to generate the following impacts:

- **Potential to increase food production and reduce malnutrition.** FA currently accounts for between 27% and 67% of total domestic food production. However, the recurring problems of chronic child malnutrition and low food-energy consumption still persist in many countries of the region. The possibilities of increasing food production by incorporating more land into agriculture are diminishing, making FA the sector with greatest potential to meet the region's growing demand for food. However, its development will only be possible if countries implement measures to facilitate family farmers' access to public goods and services for agricultural production.

- **Potential to reduce poverty.** Because FA creates new jobs in rural areas, increases food production (even though part of production is used for household consumption) and improves incomes, efforts to promote this sector would help to lift many rural families out of poverty. Even small increases in the volume of production or in sale prices could result in significant reductions in poverty, which affects more than 65% of family farmers in some countries of the region. According to the World Bank (2008), the growth of the agriculture sector does more to reduce poverty than that of any other sector. Indeed, the Bank's estimates suggest that growth in agricultural GDP is at least twice as effective in reducing poverty as the growth of GDP generated in other sectors (in Latin America specifically, the World Bank estimated that growth in the agricultural sector is 2.7 times more effective). According to the study in question, a one percent increase in agricultural GDP would generate increases of more than 6.1% and 3.9% in the spending of the two poorest deciles of the population, an impact four times greater than that produced by a one percent increase in non-agricultural GDP. Although these data refer to the agriculture sector as a whole, the social impact of growth in family farming could be even greater, since this activity is more labor intensive and has higher levels of poverty than the national agricultural average.

- **Potential to create new jobs.** FA has been shown to be one of the main generators of employment. The expansion of this sector can be attributed to the hiring of additional labor and to the incorporation of family members who have lost their jobs in non-agricultural activities during economic downturns.

2. FA in Central America

Although each Central American country has developed its own definition of FA in its policies and strategies for this sector, the authors of this study considered it necessary to construct a methodological definition in order to extract conclusions from household surveys and population and agricultural censuses. FA is defined as a farm or production unit (and family home) headed by a self-employed farmer (over 90% of whom are men) who does not employ paid workers on a permanent basis; or, is headed by an agricultural employer who, including himself and unremunerated family members, employs a maximum of five people on his farm.[1]

2.1. Characterization

2.1.1. Size of the sector and the average farm

In absolute numbers, Central America has more than 2.4 million families in the category of family farmers. Guatemala has the largest number (just over one million), while Costa Rica has the smallest (79,000 families).

Family farmers in Central America work on small farms that vary in size from one country to another (from 6.8 ha in Nicaragua to 1 ha in Guatemala).

2.1.2. Diversification as a productive strategy

Although they lack cutting-edge technology and machinery, family farmers generally use and combine their resources in the best way possible on their small farms. In fact, some authors argue that family farmers use their resources efficiently and attribute their poverty to a lack of opportunities and lack of access to public goods (IICA 2003).

Unlike commercial-scale agriculture, which is primarily aimed at maximizing profits, FA farmers seek to reduce risk by diversifying production. As a result, most family farmers in Central America do not specialize in the production of a single good. Instead, they produce a combination of staple grains (mainly maize and beans), vegetables, small animals (poultry, pigs and bees), some varieties of fruit, coffee and cattle (mostly for breeding and milk production). In general, family farmers do not rely solely on livestock production and, in nearly all cases, livestock is raised for household consumption as a saving.

2.1.3. Dynamics of the segments of FA

Throughout the LAC region, FA is mainly comprised of farmers who work their own farms and do not hire paid workers (self-employed). However, in recent years two additional categories have come to account for a larger share of the FA sector in some countries. Salaried workers for whom agriculture is a secondary activity have grown in importance in Guatemala and El Salvador, where they represent the second largest group in FA (nearly 45%). In Costa Rica, by contrast, the category of small-scale agricultural employers is second in importance and now accounts for over one-quarter of FA (in the rest of Central America, this group represents 5% on average).

Nearly 61% of all family farmers are self-employed with agriculture as their main occupation; 4%, are small farmers employing up to five people on their farms (including unremunerated family members); and the remaining 35%, are paid agricultural and non-agricultural workers or self-employed non-agricultural workers, for whom independent agriculture is a secondary activity (Table 19).

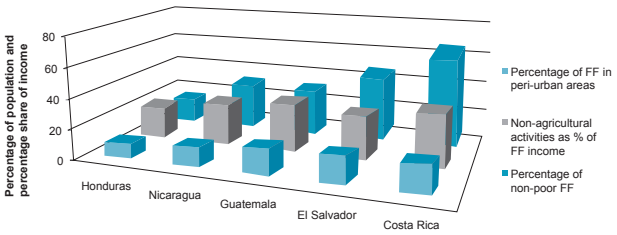
1. Based on this definition, household surveys were used to estimate the characteristics of farmers (self-employed farmers and employers of up to five workers) and their households (see Table 2).

Table 19. Number of family farmers in Central America, by category (In thousands of farmers).

	Self-employed	Small employers	Other smallholders	Total
Guatemala	564	20	478	1.062
Honduras	366	11	107	484
Nicaragua	226	17	91	334
El Salvador	115	19	96	230
Panama	109	11	44	164
Costa Rica	55	21	3	79

Source: FAO 2011.

Figure 22. Rural milieu, non-agricultural activities and poverty of FA in Central America



Soure: IICA estimates based on household surveys and population censuses.

2.1.4. Growth of non-agricultural incomes

In recent years, non-agricultural activities have accounted for a growing share of family farmers' incomes in almost all the countries of the region. According to the latest household surveys, almost 30% of the incomes of Central American farming families come from non-agricultural activities carried out by some of their members.

In countries where a higher percentage of family farmers live in rural areas (such as Honduras or Nicaragua), non-agricultural activities account for a smaller share of FA incomes and, consequently, poverty levels are higher. The opposite situation is seen in countries such as Costa Rica, El Salvador and Guatemala, where a larger proportion of family farmers live in peri-urban areas, which means that non-agricultural activities account for a larger share of family incomes.[2] Because non-agricultural activities are better paid, family farmers in those countries show lower levels of poverty (see Figure 22).

Panama is the exception: 92% of family farmers are based in rural areas but the percentage of non-agricultural income is high and poverty is low.

The higher incidence of poverty in rural households that depend entirely on agriculture has been analyzed in detail in previous reports by the Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Food and Agriculture Organization (FAO) and the Inter-American Institute for Cooperation on Agriculture (IICA). Those studies found that poverty is indeed greater among households dedicated entirely to agriculture (compared with the rest of rural households), particularly in countries with higher levels of rural poverty. In countries with low levels of rural poverty, the poorest households are those that depend mainly on remittances (ECLAC *et al.* 2012).

Remittances are one of the main sources of non-agricultural income for family farmers in Guatemala and El Salvador. According to

2. To obtain the makeup and amount of FA incomes, it was necessary to take the data on unit revenue per type of employee included in household surveys, and adjust it to farm level. To do so, the survey used the number of employees per farm included in population and agricultural censuses.

household surveys, nearly 30% of family farmers in El Salvador receive money from abroad (in Guatemala the figure is 21%). However, the real figure is known to be far higher, since many of those surveyed tend to hide the fact that they receive money, for fear of suffering theft, extortion, etc.

2.2. Constraints and challenges

2.2.1. Major socioeconomic constraints

According to household surveys carried out in 2007, 63% of the region's family farmers are characterized by high levels of poverty, very high levels of illiteracy (one-third cannot read or write) and limited access to production resources and basic services (Table 20).

2.2.2. Agro-ecological constraints and the impact of climate change

With few exceptions, family agriculture in Central America is carried out on poorer land, in agro-ecological terms, than is the case of commercial agriculture. The areas with the largest concentrations of family farmers are the mountainous and dry zones along the Pacific coast, which are more exposed to prolonged drought. In recent years, larger numbers of family farmers have settled on the Caribbean coast (growing bananas and African palm), which is regarded as an agricultural frontier zone because of limited access to roads, energy and other basic services. In Central America, the location of FA is of major importance, especially because these areas are expected to become more vulnerable to the effects of climate change, which will significantly reduce yields of products such as maize, rice and coffee.

2.2.3. Low yields

There is a major gap between the yields in FA and those in commercial agriculture, particularly in the case of products such as coffee and maize (of great importance in FA), where the yields obtained by commercial

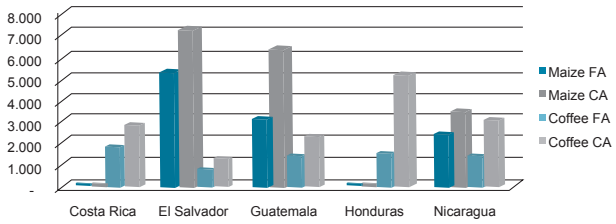
Table 20. Socioeconomic indicators for FA in Central America

Indicator	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama	Region
Literacy (%)	54.40	62.10	67.40	69.00	90.70	76.80	68.20
Average age (years)	47.00	49.00	46.00	46.00	48.00	50.00	48.00
Women heads of households (%)	11.00	6.10	12.00	7.00	6.80	11.00	9.30
Education (years)	1.90	2.60	2.70	2.40	5.70	4.10	3.20
Average land (hectares)	1.02	2.17	nd	6.72	nd	4.13	3.29
Own land (%)	77.00	39.60	nd	67.80	nd	81.80	66.00
Rural dwellers (%)	83.40	82.40	90.00	88.00	81.60	92.80	86.60
Urban dwellers (%)	16.60	17.60	10.00	12.00	18.40	7.20	13.40
Income from non-agricultural activities (%)	33.20	30.20	22.40	28.80	36.60	30.00	30.10
Members per household (number)	5.90	5.10	5.30	5.90	4.10	4.80	5.20
Housing with dirt floor (%)	55.80	38.10	47.20	64.70	3.00	35.80	41.00
Own home (%)	94.40	86.40	89.70	88.70	87.30	95.20	90.00
Access to electricity (%)	64.60	68.90	33.60	36.30	71.30	41.70	52.00
Poverty (%)	69.00	53.00	84.50	68.00	33.00	64.00	63.00

Source: National institutes of statistics and census, ministries of agriculture, central banks and comptrollers' offices in Central America.

agriculture can be twice or even three times bigger than those of FA (Figure 23).

Figure 23. Yields of main FA crops in Central America (tonnes per hectare)



Source: IICA estimates based on SICTA, FAOSTAT, ENA and IHCAFE.

2.2.4. Constraints to market access

Most family farmers in Central America do not participate in value chains and face serious constraints in gaining direct access to end consumers or to the food industry. Consequently, they have no other option but to sell their production at the farm gate. There are many local intermediaries who buy production on the farm, pay in cash and transport the goods to market. Although family farmers sacrifice a percentage of their earnings by resorting to these agents, they avoid the costs and risks associated with direct participation in markets. The main constraints faced by family farmers in trying to sell directly to agricultural markets or establishing commercial relations with the food industry are as follows:

- Lack of their own transport, which makes it impossible for them to take their production to markets or collection centers.
- Few family farmers comply with the health and quality standards required by supermarket chains, restaurants, hotels, etc.
- The volume of production is insufficient for institutional buyers.
- Family farmers hold few assets in their name (one-third of family farmers do not own the land they cultivate), so a high percentage are not creditworthy.
- The lack of credit and working capital prevents them from accepting forms of payment other than cash. This often excludes them from supplying agricultural businesses and supermarket chains, which generally offer better prices but take 30 or 45 days to pay.

2.2.5. Ageing in the rural milieu

Over the last 20 years, the rural population has been affected by negative growth rates (particularly in El Salvador and Panama), while the average age of family farmers has increased considerably. One of the main challenges faced by FA is the need to incorporate younger generations into its ranks, since many young people are tempted to migrate to cities (with some even venturing abroad) because they regard agriculture as an unattractive, poorly paid activity. Migration to the city not only excludes the new generations from agricultural and rural activities but also reduces the productivity of agriculture, as migrants are usually the people more likely to have success in finding work in urban areas. Migrants also tend to be better educated and better equipped to take on new risks and cope with new situations (ECLAC 2003).

2.2.6. Lack of intersectoral strategies with an area-based approach

Although most Central American countries have public policies for agriculture that include FA (in some cases, it is even the key element), all the policies in question are sectoral in nature. No country in the region has yet implemented a comprehensive, area-based strategy to address the issue.

El Salvador and Costa Rica have sectoral plans for FA as part of their overall agricultural policies. Panama, Guatemala and Honduras include FA in their agriculture sector policies and have developed tools designed to achieve the objectives set. In the case of Nicaragua, FA is included in the Sectoral Plan for Rural Development.

In general, terms, the core components of most public policies in the region prioritize the following elements: domestic supply, linkages in production chains, innovation, market access, poverty eradication, institutional strengthening and strategic partnerships within value chains.

The region is heterogeneous in terms of the institutional capabilities and responsibilities for FA. In Nicaragua, the General Directorate of Family Agriculture of the Ministry for the Family, Community, Cooperative and Associative Economy assumed responsibility for FA in mid-2012. Hitherto, the Ministry of Agriculture and Forestry has been responsible. In other Central American countries, the ministries of agriculture have overall responsibility for family agriculture, although the precise institutional arrangement varies. In Guatemala, it falls under the Deputy Ministry of Food Security; and in Honduras and Panama, under the Deputy Ministry of Rural Development. El Salvador has made FA a flagship project of the ministry that is coordinated with the Office of the President; while in Costa Rica, the implementation of measures related to FA is the responsibility of the Higher Directorate of Regional Operations and Agricultural Extension, which is required to coordinate its actions with representatives of other agriculture sector institutions (see Text Box 14 for further details on policies and strategies implemented by each country).

Two trends are evident in the interventions or programs used to support FA: in Guatemala and El Salvador, the authorities select specific municipalities for the implementation of actions; while in Nicaragua, Costa Rica and Panama the efforts encompass the whole country, but with emphasis on the poorest areas.

Finally, with regard to monitoring implementation and evaluating results, the Central American nations have opted for various processes. In Nicaragua and Honduras, these tasks are carried out by the same ministries responsible for executing the policies, whereas in El Salvador and Costa Rica, the respective sectoral policy offices carry out this function. In all cases, it is clear that this process is carried out on a sectoral basis.

Although significant progress has been made –particularly since 2008– the region still has much work to do in terms of designing and implementing specific intersectoral tools and strategies, including an area-based approach to development to benefit this population.

2.3. Potencial

2.3.1. Potential to increase food production

Family agriculture (family-run farms and those employing a few workers) accounts for nearly 50% of the region's total agricultural production and in countries like Honduras and Panama (Figure 24), for more than 56%. FA also produces over 70% of the food consumed in Central America (FAO 2012).

The use of agriculture sector policies to raise yields in FA (mainly through innovation and technology) would increase food availability in a region where the domestic food supply is still highly dependent on imports (see Table 21). It would also reduce the influence of external factors (such as increases in the prices of agricultural inputs, price volatility, trade negotiations, climate change, etc.) on food availability in the region.

Box 14.
Public policy instruments currently being executed in Central America.

Based on the existing regulatory and institutional frameworks, the region is currently implementing a number of policy instruments. The most important are shown below, by country:

- **El Salvador** (i) Provision of Agricultural Incentives to Centers for the Development of Basic Grain and Dairy Chains; (ii) Special Program for Food Security; (iii) Purchase for Progress (P4P); (iv) Agricultural and Energy Risk Management: a comprehensive strategy for responding to drought and food insecurity.
- **Panama** (i) Project: Agro-ecological Kitchen Gardens for United Families; (ii) Project: Promotion of School Savings and Food Production in Elementary Schools of Marginalized Communities in Panama; (iii) Savings Bank; (iv) Project: Transfer of Opportunities; (v) Project: Development of Crops in Rural and Indigenous Communities; (vi) Project: Promotion of Goat Farming as an Alternative Food Source; (vii) PARTICIPA Project; (viii) PRORURAL.
- **Guatemala** (i) Strengthening local dynamics with an emphasis on intensive agricultural production and artisanal production; (ii) Purchase for Progress; (iii) Special Program for Food Security; (iv) Seeds for Development.
- **Honduras** (i) Extension program on food and nutritional security. (ii) Project: Reducing post-harvest losses in grains; (iii) Creating Jobs in Rural Areas; (iv) Rural Incentives Program (PRONEGOCIOS); (v) Purchase for Progress; (vi) Special Program for Food Security; (vii) Seeds for Development.
- **Nicaragua** (i) Saving and managing native and domesticated seeds: a contribution to national food sovereignty and local biodiversity; (ii) Agricultural Production Bonus from the Food Production Program; (iii) Purchase for Progress; (iv) Special Program for Food Security; (v) Seeds for Development.
- **Costa Rica:** (i) Integrated Teaching Farms; (ii) Showcases for Technology; (iii) Sustainable Agricultural Systems; (iv) Organizing and Strengthening FA Networks; (v) Creation of a Social Responsibility Seal and Bar Codes for FA; (vi) Creation of a System to Register and Monitor Family Agriculture; (vii) Initiative to Strengthen the Organization of Family Farmers for Marketing and Insertion in Local and Regional Markets.

Sourcee: Central American Agricultural Council 2013.

Box 15.
FA in Mexico.

Family farmers account for 81.3% of a total of 5,347,079 production units (including the agricultural, livestock, fisheries and silvopastoral sectors); in other words, Mexico has 4,331,134 family-run farms.

The Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA) and FAO established the following typology for family farmers in Mexico:

- **Subsistence FF**, production for household consumption, with insufficient assets for production and need to supplement income with non-farm activities or government aid. Average farm-size is 3.4 hectares and, on average, 2.6 family members are involved in the economic activity.
- **FF in Transition,** production for household consumption and sale, but with minor shortages of productive resources; additional sources of income are needed occasionally but not permanently. Average farm-size is 5 ha and, on average, 2.4 family members work in rural economic activities. Their main sources of income are the sale of agricultural products (39.6%) and livestock (19.4%).
- **Consolidated FF**, sustainable production and sale in local markets, with no shortage of productive resources; additional sources of income are rarely needed. Average farm-size is 4.7 ha and, on average, 1.7 family members participate in rural economic activities. Around

43.2% of these farms are located in marginalized or highly marginalized areas. The main sources of income are sales of agricultural products (67.4%) and livestock (14.2%).

The development of FA is limited by insufficient human capital, low endowment of capital goods, low technological level, limited integration into production chains, degradation of natural resources and high vulnerability to climate events. However, the subsector also offers the following opportunities:

- Jobs for rural dwellers, since this sector employs approximately five million people.
- Opportunities for the development of appropriate technologies, given that only 5% of farms use technological innovations.
- Opportunities to develop a comprehensive range of crop varieties, since Mexico has a wide variety of microclimates.
- Development of specific market niches in response to new market trends such as fair trade and solidarity chains.
- Biodiversity - Mexico's diverse ecosystems provide a number of environmental services and products, such as food, fibers, medicines, forest products, medicinal plants, wildlife conservation, water supply and landscape services, etc.

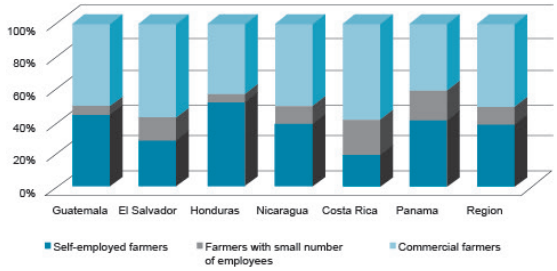
Although SAGARPA's policies and strategies do not specifically target FA, most programs and components offer support to family farmers and use a wide range of tools, based on the levels of exclusion in the areas where the farmers live. The most important programs are:

- **Sustainable Modernization of Traditional Agriculture (MasAgro).** This program focuses on providing capacity building and training in sustainable economic practices adapted to the country's agro-ecological zones, to help small-scale maize and wheat producers obtain high and stable yields, increase their income and contribute to climate change mitigation in Mexico.
- **Strategic Project on Food Security (PESA).** This project also seeks to promote capacity building and training of family farmers in marginalized and highly marginalized rural areas, in order to boost agricultural production, introduce innovative production systems, develop local markets and create jobs in order to improve food security and boost incomes.
- **Support for the production chains of maize and bean farmers (PROMAF).** The aim is to contribute to national food security and strengthen the competitiveness of maize and bean farmers by providing technical assistance, training, technological innovation, organizational development and the mechanization of farms. This initiative also promotes sustainable agriculture and the use of credit to provide capital for farming operations and to improve profits.
- Support for subsistence agriculture of small-scale producers with up to three hectares. The main objective is to help maize farmers increase their production and incomes in poor or very vulnerable areas.

However, despite existing efforts, it is also essential to create, design or adapt public policies and strategies in order to develop the potential of FA. This will call for training for human resources, technological development, the implementation of climate smart production systems, links to production chains and the management of agro-climatic risk. All this must be carried out in line with the characteristics of FA farms.

Source: FAO and SAGARPA 2012. AF con potencial productivo en México.

Figure 24. Family farmers' share of agricultural production (2007).



Source: Author's estimates based on household surveys and population censuses.

Table 21. Dependence of the domestic supply on the main crops produced by FA in Central America (in percentages).

Indicator	Rice	Meat	Beans	Fruits	Vegetables	Maize
Costa Rica	21.71	2.18	74.39	10.26	9.02	96.91
El Salvador	83.53	9.43	41.96	31.79	63.69	44.40
Guatemala	72.82	20.72	13.13	3.16	2.59	30.00
Honduras	78.45	10.16	13.81	12.49	7.60	39.81
Nicaragua	20.64	2.09	2.32	8.41	65.96	22.82
Panama	16.26	5.50	51.89	5.61	9.29	80.90

Source: IICA (CAESPA), based on data from FAOSTAT and COMTRADE 2013.

Box 16. Outlook for FA in Central America.

More participation by FA in value chains

In the years ahead, ministries of agriculture and large retailers will increasingly promote the inclusion of small family farmers in the big global food chains. Although the region's leading supermarket chains (Walmart, Gessa, Automercado, Hiper Paiz, Super Selectos, El Rey, etc.) have already implemented some cooperation programs with family farmers that include technical assistance, the provision of inputs and future purchase contracts, this trend is expected to intensify over the next few years.

To ensure that farmers' production practices respond to the tastes of their consumers, supermarket chains, hotels, restaurants, etc., will offer their associates advice on good practices (seed quality, use of soils, yields and crop rotation) and on standards of quality, safety and manufacture. This support will enable family farmers to become more professional, ensuring not only that their products are better adapted to market requirements but also that they obtain higher prices for their products. For example, in 2010 Walmart, the region's largest supermarket chain (with over 500 supermarkets in the five countries), established a program to support small-scale farmers in Central America, pledging to purchase 80% of its fruits and vegetables directly from local producers by 2015, and to increase purchases from small and medium-scale producers by 30%.

Telecommunications reach rural areas

Increased coverage of telecommunications in rural areas of Central America will enable farmers to access more and better information on production and markets (mainly via cell phones), thereby increasing their capacity to produce, manage their farms and negotiate. The use of new information and communication technologies (ICT) will expand marketing opportunities for farmers (both in domestic and external markets) particularly in a Central American market that is rapidly moving toward integration (with 45 million consumers at the present time).

The routine use of ICT in government agricultural institutions will also help to incorporate new actors into their technical assistance programs, expand their geographic area of coverage and offer products and services that are more appropriate to the needs of the region's family farmers.

Implementation of free trade agreements

Almost 80% of Central America's family farmers are small-scale basic grain producers (PRESANCA-PRESISAN 2011). An estimated 60% of these households are affected by food and nutritional insecurity, while 34% live in poverty and 32% in extreme poverty. Not only are they significant because of their number and disadvantageous socioeconomic conditions, but also because they are major suppliers of the most important foods in the regional diet. Together, these farmers produce nearly 75% of the maize and beans consumed in the region (FAO 2012).

For this reason, smallholders have historically received production and commercial support that, depending on the country, ranges from technology (particularly new seed varieties) and inputs to income guarantees or border protection. Various mechanisms have been used, including donations, subsidies, import tariffs and support for minimum prices in local markets. For the same reasons, certain products are regarded as "sensitive" in the free trade agreements that the region has signed with third countries, and therefore longer periods were agreed for the elimination of tariffs.

In fact, given the countries' prior commitments to the WTO, the implementation of the free trade agreements negotiated by the region in the last decade will mean that many support measures must be eliminated or reformulated. For example, under the free trade agreement signed between the region and the United States, the tariff elimination period for white maize and beans ranges from 8 to 10 years. This means that by 2022 any economic agent will be able to import any amount of those basic grains free of tariffs. Consequently, it will be necessary to implement policies that help family farmers cope with the increased competition resulting from that new scenario.

Given the major differences between yields in FA and commercial agriculture, it will be necessary to redesign and reformulate these supports, otherwise free trade may force large numbers of small-scale grain farmers out of the market. This would undoubtedly have a very significant social impact.

2.3.2. Potential to create new jobs

Household surveys suggest that family farming accounts for over 64% of self-employed agricultural workers. This may be an underestimate, however, because the figure does not take into account all unpaid family members who work on the farm (because of legal concerns, many of the people surveyed report a smaller number of young people and children employed in FA).

The role of FA as an employer is especially important in the case of women, who have limited access to employment in rural areas. In fact, in recent years the percentage of women heads of rural households in Central America has risen, with women currently accounting for one-quarter to one-third of the total (ECLAC *et al.* 2012).[3] The increase in women heads of agricultural households has a positive impact on the use of family income, since women tend to avoid using income for non-basic household consumption.

3. In 2010, the percentage of rural households headed by women was 25.8% in Costa Rica, 30.3% in El Salvador, 25.9% in Honduras, 23.2% in Nicaragua and 25% in Panama. Although these proportions are lower in family farming households, their numbers are growing, mainly due to migration.

3. The situation in el Caribbean

3.1. Characterization

In contrast to the agricultural expansion seen in Latin America during the last decade, the Caribbean has experienced a decline in its agricultural trade balance and a decrease of more than 50% in its share of world agricultural exports (FAO 2010). The global context of food price increases and volatility observed in recent years has negatively affected the Caribbean economies. With the exception of Belize and Guyana, this subregion relies heavily on world markets for its food supply, importing between 60% and 80% of its food needs. Such high import levels create uncertainty in domestic food prices, something that was very evident during the food crisis of 2006-2008, when the domestic prices of various commodities rose by more than 300% in some countries of the subregion.

This strong dependence on food imports to satisfy domestic demand threatens the nutritional security of the population in general, and of poor and vulnerable households in particular. In recent years, the Caribbean countries have also suffered the effects of natural disasters, such as hurricanes and the earthquake that hit Haiti in 2010, which have had a big impact on infrastructure and agricultural yields.

In their search for solutions to tackle this situation, the Caribbean countries have recognized the enormous potential of FA, both for food production and for generating agricultural employment and incomes for the most vulnerable groups. Effective efforts to support the development of this sector would result in substantial improvements in food security and the mitigation of rural poverty, contributing significantly to the sustainable economic development of the subregion (FAO 2012).

3.1.1. Lack of information on FA in the Caribbean makes it difficult to assess its true potential

Information on FA in this subregion is limited and is not available in all countries. In general, the data refers to the agricultural sector as a whole, without differentiating the FA segment. This has resulted in a high degree of ignorance about the subsector, making it difficult to assess its real contribution to economic development and, therefore, complicating the design of specific policies and programs, as well as the quantification of its impacts.

The different definitions applied to a farm or agricultural unit in the subregion constitute a further obstacle. The basic requirements that define an agricultural unit vary greatly from one country to another, undoubtedly making it more difficult to analyze information and making it essential to create standardized subregional databases.

Nevertheless, an assessment of FA in the subregion has been prepared, based on an analysis of the 2004-2007 Agricultural Census conducted in eight Caribbean countries[4] (Graham 2012). This study is currently the most comprehensive and reliable source of data for characterizing FA in the Caribbean. However, no data is available on the specific socioeconomic, productive and management characteristics of small-scale producers. For this reason, the study was complemented with other analyses of the agricultural sector carried out in the various countries of the subregion. The study highlighted a number of facts about small-scale agriculture that are detailed below.

4. The Agricultural Census carried out in 2007 included the following countries: Jamaica, Antigua and Barbuda, Grenada, St. Kitts and Nevis, St. Lucia, Trinidad and Tobago, St. Vincent and the Grenadines and Dominica.

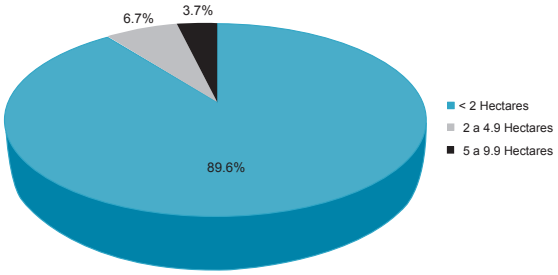
3.1.2. The characterization of FA in the Caribbean reveals a heterogeneous sector and increasing land fragmentation

- Profile of a small farmer in the Caribbean. The typical small-scale farmer in the Caribbean subregion is predominantly an individual between 41 and 54 years of age who operates on two hectares or less and includes landless farmers.[5] Farm size is a determining factor in the heterogeneity of small-scale agriculture, given the variety of agricultural units (ranging from landless farmers to farmers owning up to five hectares) and the varying capacity and potential of their productive resources and their different agricultural practices.

  In general, traditional production systems are used. Production mainly involves food crops and, to a lesser extent, the raising of small ruminants or poultry farming, artisanal fishing and small-scale aquaculture. Some smallholders have expanded their operations to include agro-tourism, production of ornamental plants and, to a lesser degree, agro-forestry activities.

- FA accounts for the largest number of farms; however, these are subject to progressive fragmentation. In the countries studied, 89.6% of all farms less than 10 hectares in size are small-scale operations, many with a surface area as small as two hectares. These plots make up 55.2% of the total agricultural surface area (Figure 25).

Figure 25. Percentage distribution of farms under 10 hectares in the Caribbean



Fuente: Graham 2012.

The number of farms measuring two hectares or less varies from one country to another, as does their degree of fragmentation. By way of example, in Antigua and Barbuda, 45% of farms are less than 0.5 hectares in size, while in Trinidad and Tobago the figure is 21.8% and in Saint Lucia, only 2%. Moreover, there is another group of smallholders, classified as 'landless,' who practice transhumance.

- Land is mainly family-owned: around 56% of farms in the Caribbean are owned by the holder, another 26% are family owned, 10% are rented and the remainder are operated under various legal arrangements, both on private and government land. The information available reveals a significant trend toward family ownership of small farms (of less than two hectares in size in St. Lucia and less than one hectare in Jamaica), showing that ever-smaller areas are being used for agriculture, with the consequent negative impact on the food security of the countries concerned.

- Farmers' age structure is dominated by middle-aged or elderly people. In a pattern similar to that observed in Central America, 71.2% of Caribbean farmers are over 40 years of age (Graham 2012); this age group increased by 3.2% between 1999 (OECS/EDADU/FAO 1999) and 2010. Although these studies do not specifically refer to the FA sector, it is possible to con-

5. A farmer who does not meet the minimum economic criteria to be counted in the agricultural census but who owns some animals roaming around on land.

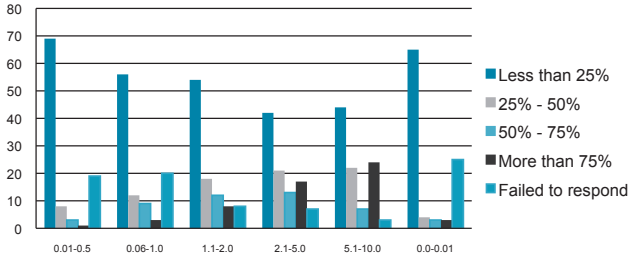
clude that this age distribution is replicated in this segment, given the high proportion of smallholders among the subregional farming population.

- Women's share of farm ownership is low. In the Caribbean, women are involved in agricultural and livestock activities, especially in growing and selling food crops. Although women play varied and important roles in small-scale agriculture, this segment is dominated by men, with no more than 30% of farms owned by women (Graham 2012). According to the information available, Guyana has the lowest number of women farm owners among the countries studied. By contrast, in St. Lucia women owners increased from 26% to 30% during the 1996-2007 period.

- Agriculture's contribution to incomes has decreased. This has also happened in Central America. Data on agricultural incomes in the subregion is available for Antigua and Barbuda and St. Lucia. Once again, even though the data considers the farmer population as a whole, it is reasonable to assume that this situation is reflected in FA.

  In St. Lucia, there was a clear decline in the contribution of agricultural activities to farmers' incomes during the period 1996-2007. Whereas the farming population that generated less than 25% of household income from agricultural activities increased by more than 50% during that period, the proportion of households that obtained over 75% of their incomes from agriculture declined. In Antigua and Barbuda, the situation was similar, with 59% of agricultural households generating less than 25% of their income from agriculture and only 7% of farms claiming to earn more than 75% of their income from agriculture. This pattern was particularly evident among the most fragmented farms (0.0 to 0.25 ha), where nearly 70% of households obtained less than 25% of their income from agriculture (Figure 26); and even more marked among young people aged 15-35, with 88% earning less than 25% of their income from agriculture.

Figure 26. Percentage distribution of income from agriculture, by farm size



Source: Graham 2012.

3.1.3. Productive characteristics of FA have not changed significantly in recent decades

- Products – FA produces a wide range of food crops, particularly vegetables, fruits (mango, pineapple, plantain, oranges) and potatoes. Production has not changed significantly over the years (Table 22). No information on yields is available for those crops.

- Production systems: most small-scale farmers use traditional agricultural systems, such as crop rotation and intercropping, to produce a wide range of food crops. A small number of farmers practice organic agriculture and monoculture. Some examples of the species most frequently combined in these production systems are as follows:

  - Crop rotation: carrots, green beans, cabbage, dasheen, ginger, yams.

Table 22. Main products grown by FF in the Caribbean, 1978-2012.

OECS Belize 1978	OECS 1999	OECS 2008	Belize 2012	Jamaica 2012	Guyana 2012
Mango	Vegetables	Vegetables	Cabbage	Vegetables	Pumpkin
Avocado	Sweet potato	Sweet potato	Lettuce	Sweet potato	Papaya
Potato	Plantain	Potato	Hot pepper	Plantain	Vegetables
Sweet potato	Mango	Apple	Pumpkin	Mango	Pineapple
Carrot	Pineapple	Mango	Tomato	Oranges	Dasheen
Tomato	Dasheen	Oranges	Watermelon	Grapefruit	Oil palm
Beans	Pepper	Watermelon	Coconut	Papaya	Coconut
Vegetables	Apple	Plantain	Maize	Pineapple	Peanuts
Maize		Pineapple	Beans		Cocoa
		Squash	Citrus		Cashew
		Coconut			
		Peanuts			

Source: Graham 2012.

Carrots, green beans, cabbage, tomatoes, sweet potato, yams.

- Intercropping: green beans with maize, yucca with pigeon peas and maize, plantain with yams, plantain with peas and pigeon peas, coffee with bananas, coffee with forest trees.

- Organic crops: vegetables, herbs, coffee and cocoa. Small-scale farmers also use other environmentally friendly practices, such as composting and vermiculture.

- Monoculture: smallholders who grow a single crop are mostly linked to the export market. The most common monoculture crops are lemons, mangoes, apples, pineapples, coconuts, avocadoes and dasheen.

- Yields: most small farmers produce food crops in open field. Productivity levels tend to be low because most farms are rainfed and located on marginal land or hillsides, making production costs higher. In order to overcome these limitations, the subregion is gradually adopting a number of modern and environmentally sustainable practices to improve long-term productivity. For example, some small farmers have developed innovative ways of storing rainwater, though still in much smaller quantities than those required. In practice, small-scale farmers continue to program their planting times to minimize risks during drought periods.

3.1.4. The scale of backyard farming is unknown

With the exception of Antigua and Barbuda, the census information does not include data on backyard gardens, even though the ministries of agriculture have tried to promote and strengthen backyard farming in order to increase domestic food production and food security, with good results in some countries. For example, the census in Antigua and Barbuda revealed that around 40% of the fruit trees grown in that country –mainly citrus, mango and coconut– are found in family gardens.

Given the subregion's high levels of food imports, it is essential to quantify backyard farming in order to determine its specific contribution to the different crops of each country, and to support the design of programs adapted to the sector's development needs.

3.1.5. Limited access to and use of modern technologies in FA

Investment in technology and agricultural infrastructure is very limited on small-scale farms in the Caribbean. Many farmers apply production and food distribution practices that do not comply with required safety standards. A large number of farmers use agrochemicals to improve soil fertility, as well as pesticides and antibiotics. Some have adopted sustainable practices, such as integrated pest management and micro-irrigation, while a growing number of farmers use greenhouses, which have become increasingly popular, particularly among vegetable growers.

In general, small-scale farmers have access to national training programs on good agricultural practices (GAP), which are available in most countries; however, the lack of infrastructure is a major obstacle to compliance with protocols.

Stock raising is underdeveloped in the subregion's small farm sector. Production tends to focus on small ruminants (pigs, goats and sheep), with extensive practices but without special management, adequate infrastructure or recordkeeping. Some small farmers have modern livestock facilities, as do many small-scale poultry farmers, who often have contractual agreements with large processing plants.

3.1.6. FA production is primarily directed at the domestic market, with various methods of payment

- **Most production is destined for local markets.** Small-scale farmers generally sell their products at local or community markets and peri-urban produce markets, or else to supermarkets, hotels and restaurants. Some small farmers have adopted technologies and practices that ensure a reliable supply of fresh produce to domestic markets (especially leaf vegetables, tubers and fruits). However, large-scale imports of fruits and vegetables, together with the dominance of national supermarket chains and wholesalers, create powerful competition for FA.

  In an effort to consolidate certain market niches, there has been a recent trend towards the participation of small farmers in value chains. This strategy is increasingly popular among smallholder organizations and cooperation networks, but most farmers are not yet benefiting from such arrangements. In addition, several farmers' associations have formed partnerships with luxury hotels and supermarkets, which offer them preferential terms.

  As to the external market, some farmers have signed commercial agreements to supply exporters with fresh produce, especially vegetables and tubers. Others continue to benefit from special provisions for traditional exports (bananas and rice).

- **Payment methods vary.** Small farmers are involved in many different types of payment arrangements, including cash on delivery, farm gate sales and even payment by installments. This last form of payment is generally used by supermarkets and hotels, although it is not always favorable to farmers, as they are often exposed to long delays before receipt of monies owing. The more organized farmers have been able to payment agreements.

- **Producers' organizations are currently under development in the Caribbean.** Although farmers' organizations in the Caribbean are still weak, the leading subregional and national farmers' associations are working to improve production and marketing. These organizations include:

  - **The Caribbean Farmers' Association Network (CaFAN).** Represents around 500,000 small farmers in the subregion across 12 countries. It provides support services in areas such as production, marketing, risk management, organiza-

tional management and resource mobilization, and facilitates participation in forums of interest to small farmers.

- **Windward Islands Farmers' Association (WINFA).** Seeks to promote sustainable livelihoods for farmers through fair trade and agro-processing, build capacities on global and agricultural related issues, represent small farmers in policymaking and promote the mainstreaming of gender issues in its programs.

- **National farmers' associations.** Most countries have strong farmers' association networking, which helps small farmers to market their produce, e.g., the farmers' associations of Guyana, Trinidad and Tobago, Barbados and Jamaica.

3.2. Main challenges in developing the potential of FA

The literature points to a number of constraints that hinder the development of FA in the subregion (OECS 2012 and Graham 2012). However, most of them have not been measured and existing studies do not describe strategies to mitigate or overcome them. Moreover, there is a lack of information on subsistence agriculture. These challenges, combined with the restrictions of poverty and vulnerability inherent to FA, affect its possibilities for development.

Given the high levels of food imports in this subregion, it is essential to analyze and characterize this sector, and conduct in-depth studies on FA's potential contribution to national economies, poverty reduction and the improvement of food security. In this context, the main challenges that should be prioritized in public policies and programs directed at FA in the Caribbean are analyzed below.

- **Access to technology to improve yields and productivity.** One of the main reasons for the low yields in small-scale agriculture is the limited or non-existent access to new technologies and quality inputs (FAO 2012). Given that the Caribbean is highly dependent on food imports, efforts to improve the low yields of FA should be a priority. The positive impact of increasing yields will translate into significant improvements in the region's food security. The challenge is to ensure that research systems focus on the needs of family farms and develop modern technologies suited to their production systems, in order to boost food production, help improve the Caribbean population's food security and, in addition, reduce food imports in the subregion.

- **Access to extension systems and relevant training for the sector.** Small-scale farmers in the Caribbean have limited access to technical assistance. In general, extension services are designed for medium- and large-scale farmers, and do not address the needs of FA, which limits the training opportunities for small farmers. Extension systems should take into account the specificities of FA and involve smallholders in extension programs that disseminate good practices relevant to their situation, and preserve traditional techniques and combine them with cutting-edge ones.

- **Access to information to support decision-making.** The subregion has almost no agricultural information systems that could provide farmers with technological, market and agro-climatic information to support their decision-making. This situation is most critical in small-scale agriculture. The challenge is to create information systems that offer farmers timely data relevant to their needs. One successful example in the subregion is NAMDEVCO, the National Agriculture and Marketing

Box 17. Haiti: Dairy development projects for family farms

FAO is currently implementing two projects in Haiti that will significantly improve the capacity of family-run livestock farms to increase their productivity and yields. They will also increase the incomes of participating farmers. The projects are financed under a South-South cooperation agreement with the Government of Brazil.

FA plays an essential but often forgotten role in the Haitian economy, where average farm size is 0.68 ha. In Haiti, 60% of the population lives in rural areas and family farms account for more than 45% of agricultural production.

One of the projects, entitled "Supporting milk production and family food security," aims to increase milk production through direct investment in small-scale dairy producers. The project will also provide training on best practices in milk production, support extension services and strengthen existing non-governmental and farmers' organizations. As part of this project, a number of technical officers from Brazil and Cuba are providing technical assistance to farmers in the areas of animal nutrition, breeding and animal health.

The second project seeks to improve the living standards of small-scale farmers by supporting the development of the dairy industry and strengthening the network of processors and producers. One of the main results will be the construction of three new dairy plants, where family farmers can sell their milk. These dairies will serve as an important link in the milk value chain and will also add value to production by producing cheese and other processed products. In addition, the project will offer training to farmers involved in the dairy industry.

Both projects are working closely with Haitian grassroots organizations such as VETERIMED and Let Agago, in an effort to boost the productivity of milk producers in the network, and to monitor the quality and safety of the milk from the new dairies, which will be used to supply the National School Food Program.

Source: FAO 2012.

Development Enterprise of Trinidad and Tobago, which provides farmers with critical information to support timely decision-making. In 2010, the system already had 78,000 farmers registered. NAMDEVCO has shared this system with other Caribbean countries such as St. Lucia, Jamaica and Guyana.

Given the subregion's dependence on food imports, farmers not only require information about the prices of local products but also need to know the international prices of the main imported products, particularly if their production is aimed at replacing those products or if it is linked to exports. Having access to information on prices and markets also enables small-scale farmers to negotiate better prices and sign contracts. It should be emphasized that these databases require user-friendly and accessible systems, ideally with online mechanisms. These technologies are non-existent in many rural areas of the Caribbean.

- **Access to financing systems.** Limited access to agricultural credit is one of the factors that most affects the development of FA. This is reflected in low levels of investment in technology and agricultural infrastructure in the sector. The supply of financial services in the subregion is limited and agricultural credit banks have a minimal role as loan providers to farmers (7.7% of all loans). Smallholders are of

the opinion that the agricultural development banks operate within complicated regulatory frameworks that do not meet their needs, which translates into credit products and quotas that are not suited to their capacity to pay. The situation is further aggravated by the banks' loan guarantee requirements, given that few farmers have land titles or other assets that can serve as loan guarantees. These difficulties force many producers, including small farmers, to seek loans from commercial banks, which tend to offer short-term loans that are costlier.

In order to develop the FA sector, financing systems must be adapted to the needs of small farmers, with regulations that facilitate their use. In the case of subsistence agriculture, the challenge is different: the idea is to facilitate access to investment and working capital using non-credit mechanisms, since the vulnerability of these farmers makes it impossible for them to pay back loans. The challenge, therefore, is to design non-reimbursable investment programs.

- **Access to farmland and water resources.** Small-scale farmers face serious constraints stemming from the shortage of land and water. Many of them cultivate rainfed plots. The census for Antigua and Barbuda revealed that rainwater is the only source of water for many small farmers, while in Saint Kitts and Nevis, 60% of farms are located on rainfed plots. In Jamaica, this figure is even higher, because most farmland is located on hillsides. Due to the lack of water for irrigation, the subregion has had to adopt various innovative ways of improving the irrigation systems of small farmers; however, these are still insufficient. Meeting the challenge of providing access to water is an urgent priority for the entire FA sector, since it helps to mitigate the effects of drought and potential reductions in yields and harvest losses. With regard to agricultural land, most family farms have poor quality soils that offer only low productivity. The majority of these farms are small in size and lack irrigation systems. It is therefore necessary to design policies aimed at improving access to agricultural land markets for FA. This challenge will not be easy to resolve, given the structure of land tenure in the Caribbean, where few plots have titles and alternative land tenure systems continue to exist. With squatting also a problem, the subregional land market mostly operates in an informal manner (FAO 2012). The pressure on land and water for a range of non-agricultural purposes is another factor that negatively affects FA's access to those resources. In the Caribbean, tourism, property developers and the industrial sector are the main competitors for the use of water resources and quality land, which directly affects food security.

- **Access to risk management mechanisms for addressing potential natural disasters and agricultural theft.** Nowadays, small-scale farmers are continuously faced with potential losses and risks due to climate and agricultural theft. Climate events such as hurricanes, irregular rainfall patterns and prolonged droughts are becoming more frequent in the subregion. Most small-scale producers do not have the tools to mitigate these risks, given the absence of agricultural insurance or the lack of access to such programs because of bank requirements. A second major cause of losses is agricultural theft. Although most countries have laws that punish agricultural theft, in practice they have not been effective. According to CARICOM (2010), nearly 70% of farmers have been victims of praedial larceny (theft of crops or livestock). Smallholders are more vulnerable to theft of their crops, since they often live far away from the farm and cannot afford security fences. This situation calls for the development

of comprehensive risk mitigation policies, with a regulatory framework designed to benefit small-scale farmers. However, the debates under way in the subregion suggest that their implementation will require considerable public funding, perhaps beyond the capacity of current national budgets. Meanwhile, small farmers continue operating under the threat of losing part –and sometimes, all– of their production, without having access to effective tools to manage those risks.

- **Creation of organizations and partnerships.** In most Caribbean countries, associations representing small-scale producers are weak and have limited participation. The collective action of this sector is essential to help overcome problems related to small production volumes, transaction costs and lack of access to markets and credit, among others. It is also necessary to encourage partnerships with other actors involved in the development of FA, in order to create better and more sustainable conditions for market access. Finally, the active participation of these organizations in the public-private sphere is a challenge and would help to highlight the FA sector's needs and potential.

3.3. Agricultural policies

Policies and programs to improve food security and reduce poverty: a key objective for the subregion in the coming years

In recent years, this subregion has implemented a number of policies to address the problems of food and nutritional security, improve subsistence agriculture's contribution to food production and ensure that FA is included in the countries' development priorities. As a result of these policies, a number of improved measures have been adopted to tackle constraints to the growth of agriculture and competitiveness. The most important policies include the following:

- Jagdeo Initiative (2007), aimed at promoting agricultural competitiveness, facilitating trade and rural prosperity, and studying land use and consumption patterns throughout the region.

- Common Agricultural Policy (2010), which addresses several issues of interest to small-scale agriculture, including innovative credit systems, risk and disaster management, agricultural research and extension services, quality control and value chains.

- The OECS Regional Plan of Action for Agriculture (2011) includes incentives to support the development of the most vulnerable rural populations. It contains guidelines for subregional agro-tourism and early warning systems to respond to climatic events in rural communities, etc.

- Food and Nutrition Policy and Regional Action Plan (2011), aimed at strengthening production systems and improving policymaking and program management to address the main threats to food security and guarantee the food supply.

As a complement, some Caribbean countries have taken steps that reflect their commitment to improve food security and increase agricultural output. For example, Trinidad and Tobago has modified the Ministry of Agriculture's sphere of action, transforming it into the new Ministry of Food Production, which implements a State agricultural policy (Text Box 18).

Box 18. Technical assistance for the design of Trinidad and Tobago's 2012-2015 agriculture sector policy

The economy of Trinidad and Tobago, a small island developing state (SIDS), is dependent on the exports of the country's energy sector. The global financial crisis, food price volatility, the rapid expansion of the tar sands and non-fossil energy technologies prompted the government to review its development strategy and focus once again on national food security. In the context of medium-term national policies, the government's strategic agenda includes the creation of "Links between agriculture and other productive sectors" and the promotion of "a multisectoral approach to agricultural development." At the government's request, FAO implemented a technical cooperation project to support the formulation of Trinidad and Tobago's agricultural policy (2012-2015).

Policymaking is a process in which experience matters. In this case, FAO and the Ministry of Food Production of Trinidad and Tobago pooled their resources. The two institutions agreed on a multi-stage strategy and adopted the results-based approach to public management. They defined the scope, data sources and responsibilities during the first stage of the process. In this phase, high-level consultations and information seminars were organized with key domestic and external interest groups. Based on FAO's experience with a similar project in El Salvador, the ministry and IICA undertook a joint study to establish the producer profile, so as to have more information on which to base decisions. During the second stage–*capacity building*– training activities were organized using online and onsite workshops to analyze the concepts of policymaking and conduct feedback exercises on the assessments, using the problem trees methodology. The basic principle of capacity building is "learning by doing." The people in charge of planning the activities applied the concepts learned to design problem trees and establish preliminary policy solutions for 15 products or groups of basic products and six topics for cross-cutting policies.

En la segunda etapa, fortalecimiento de capacidades, las actividades de formación emplearon talleres virtuales y presenciales sobre los conceptos de formulación de políticas y ejercicios de retroalimentación en los estudios de diagnóstico, mediante el método de árboles de problemas. El principio de la creación de capacidades es aprender haciendo. Los responsables de la planificación aplicaron los conceptos aprendidos para generar árboles de problemas y establecer soluciones de política preliminares para 15 productos o grupos de productos básicos y seis temas de políticas transversales.

With those outputs, the Planning Division conducted a series of consultations with specialists and focus groups for the basic products. Based on the results, the planning officers prepared analytical documents for the cross-cutting issues and basic products selected. After a number of feedback meetings, and with technical assistance from FAO officials, the Planning Division fine-tuned each working document and produced the text of each section of the first version of the country's agricultural policy document.

The ministry intends to complete the last phases of the policy formulation process with a broad-based consultation.

Box 19. Outlook for agriculture in the Caribbean.

The countries will assume a political commitment to address rising food prices and reduce dependence on imports by boosting productivity. For many years, the Caribbean has been affected by high prices, high food imports and frequent natural disasters. All these factors have had a negative impact on agricultural production, creating an unfavorable context for food security. Moreover, in the coming decade, commodity prices are expected to remain high due to growth in the demand for food and the deceleration of global production (OECD and FAO 2013). Over the same period, food production will increase, essentially as a result of higher productivity rather than through the incorporation of new land into agriculture (which is expected to be minimal). According to FAO (2012), countries need to promote the sustainable growth of production by maximizing the potential of small-scale agriculture.

Information will be gathered to assess the needs and contributions of FA. The lack of information on small-scale agriculture is a major obstacle to assessing its true potential. Having objective and continuous records showing FA's contribution to economic development is essential to design appropriate agricultural policies and actions that meet the sector's needs. Countries must therefore establish information systems (e.g. farmers' registers and agricultural censuses) in order to characterize FA, define the types of producers involved and identify their main needs and gaps in competitiveness.

Countries will promote an institutional framework for the development of FA. Countries must recognize the specificities of FA and create a specific institutional framework (public policies, institutions and programs) that takes account of its socioeconomic and agro-ecological heterogeneity. Efforts to build this type of institutional platform are already evident in several LAC countries, and have helped to overcome asymmetries affecting the sector's performance, resulting in greater levels of equity. Implementing a framework for FA requires differentiated policies, according to conditions in each country and in each segment of producers (IICA 2012). This will make it possible to distinguish between the needs of the poorest groups and those of small-scale producers linked to markets. These policies must also be based on an area-based approach (*enfoque territorial*) that takes account of local conditions. Adopting this approach would be particularly helpful to the development of the subsistence sector, which has limited potential for agriculture.

Agricultural production will be organized as a component of rural development. Many of the problems affecting FA lie outside the remit of agricultural institutions (FAO 2012). Countries will need a comprehensive State vision that facilitates the design and coordination of intersectoral policies and strategies for agricultural development, and that also incorporates those designed by other sectors that influence the development of FA. Thus, development strategies must include infrastructure and social investment initiatives to effectively support production policies and programs.

Subregional innovation systems will be strengthened to improve FA's productivity and competitiveness. Innovation systems in the Caribbean face serious budget constraints and have major weaknesses in terms of their comprehensiveness, equity and coverage, which affects their performance. Because research directed at FA is limited, it is vital that countries design strategies to improve technology and innovation that will ensure the inclusive development of this sector. The strengthening of the Caribbean Agricultural Research and Development Institute (CARDI) is a major step forward in creating a system of science, technology and innovation networks in the Caribbean and Latin America. However, it is not enough: this system must also include specific actions to improve the competitiveness and sustainability of the FA sector and create a chain of knowledge with access to innovative technologies and strengthen extension systems, in line with the needs of family farmers. Countries are already committed to investing in technology for FA, as reflected in the Declaration of the Ministers of Agriculture of the Americas (2011).

Countries will promote the sustainable insertion of FA in markets. The rising cost of imported foodstuffs has fuelled demand for traditional staples and grains for livestock production, which are mainly produced by family farms. Countries should take advantage of this opportunity by developing markets for those products, both domestic and in other countries of the subregion. To do this, governments need to adopt measures to safeguard agricultural health and food safety in the negotiations on subregional and external trade agreements. A small number of market-oriented small-scale producers from the subregion have been incorporated into value chains in an effort to expand domestic food marketing activities. Given the good results achieved, this approach should be a priority on the agenda for the development of FA.

Associativity among family farmers will be strengthened, together with links with other relevant agents. Countries must encourage producers' organizations to participate in policymaking to make agricultural programs more relevant. They must also involve the rural sector in decision-making, foster linkages among family farmers and other economic agents and optimize their integration into markets. Education and training will strengthen and give legitimacy to these organizations, as will the sharing of experiences among FA organizations in the Caribbean.

Governments will promote greater access to production resources and their sustainable use for family farmers. Limited access to land and water resources and soil degradation are problems that commonly affect FA, contributing to inequality. These problems must be tackled through increased investment in on-farm and off-farm irrigation systems, alternative water capture technologies, land acquisition programs and soil conservation and rehabilitation, to ensure the sustainability of production systems.

Some Caribbean countries have unused land that could potentially be used for agriculture to help increase productivity, improve food security and reduce imports. However, governments would have to establish agricultural land banks and create incentives for the use of land for agricultural activities. Countries also need to create land zoning plans, diversify crops and organize water resources. Finally, the high frequency of natural disasters in the subregion underscores the need for countries to set up information systems on water and land resources, along with timely measures to mitigate the effects of extreme events on agricultural production.

Countries will facilitate FA's access to working capital and investment. The implementation of financial systems that provide small-scale farms with access to working capital and investment must include loans with variable terms and subsidies for modernizing production. The level of resources required for these purposes greatly exceeds the public sector's capacity and therefore the private sector will need to be involved. Other instruments can be used to distribute resources more equitably, such as competitive funds to finance investments (containing different types of subsidies) or collective funds with a cooperation-type component (such as revolving funds and guarantee funds used in different LAC countries).

The subregion will take steps to attract young people to rural areas. It is essential to encourage young people to settle in rural areas and promote their inclusion in local economies to ensure generational change and improve the productivity and competitiveness of agriculture. To do so, governments must create better opportunities in the areas from which people migrate and consistently design positive discrimination policies to benefit young people and improve farm profitability. The Caribbean countries have already taken steps that show their interest in addressing those challenges. One example is the organization of the Caribbean Agricultural Forum for Youth (CAFY) in 2012, where delegates issued recommendations aimed at encouraging young people to remain

in the countryside, including the implementation of comprehensive programs for young rural entrepreneurs, mechanisms to provide access to land, capital and farm insurance, and training in production and management aspects of agriculture. The idea is to complement these programs with comprehensive and participatory policies that address the many needs of rural youth, with a positive bias toward the most vulnerable young people.

4. The situation in South America

4.1. Characterization

4.1.1. Access to production resources

Access to land varies from one country to another, ranging from 7% in Paraguay to approximately 57% in Colombia. Within this heterogeneity, the countries can be divided into two large groups: in the first (Paraguay, Uruguay, Argentina and Brazil), FA accounts for less than one-quarter of farmland; in the second (Ecuador, Chile and Colombia), the FA sector controls around half or more of agricultural land.

Average farm size per producer also varies greatly from one country to another (from 3 hectares in Colombia to 142 hectares in Argentina). The most common average farm size is around 10-20 hectares.

The analysis of access to water resources is much more difficult. Indeed, although it is highly likely that there are major gaps in access to water for irrigation to the detriment of FA –gaps that are widening due to climate change and an evident loss of water resources across the globe– this aspect has not been thoroughly documented and quantified. Despite the fact that most agricultural censuses include variables related to irrigation (e.g. irrigated area, water sources, water rights system, irrigation techniques), these seldom include a breakdown for family farmers. However, there is some specific data for Chile (which would be particularly interesting to complete with data from other countries), where 41% of family farms have access to irrigation, compared with 70% of medium and large-scale agricultural units (INDAP-Qualitas Agroconsultores 2009).

4.1.2. FA's contribution to food production

As mentioned previously, in all LAC countries FA is a major contributor to the production of different commodities, particularly basic grains, tubers, meat and milk (Table 23).

4.1.3. Social characteristics

- **Gender: growing importance of women's contribution in the countryside and in agriculture.** The proportion of heads of farm households in LAC who are women varies from country to country, ranging from 8% to 30%, with an average of just over 16%. These figures reflect two trends that need to be highlighted. First, the proportion of women is always higher on smaller farms, that is, on family-run subsistence farms. Second, the average size of their farms is always significantly smaller than that of those run by men. The census information shows that the proportion of women heads of household is much higher in the case of smaller farms (generally those under one hectare) than the national average: the difference is at least 10% to 15% (Ecuador, Paraguay and Brazil) and over 20% in the case of Chile.

  This pattern is confirmed by other studies on small-scale agriculture: in Argentina,

the average proportion of farms headed by women is 12%, but the figure for the least capitalized stratum of small-scale agriculture is 62% (DDA *et al.* 2007, in Obschatko *et al.* 2007). In Uruguay, 18% of heads of farming households are women, while in small-scale agriculture they represent 32% of the total (MGAP *et al.* 2013). In Brazil, women heads of household account for 13.7% of FA farmers and less than 7% of farmers in the rest of the agricultural sector (IBGE 2009).

The regional trend toward the feminization of the rural milieu over the last decade is also reflected in the number of women farmers. Some inter-census comparisons show that in countries such as Chile and Paraguay, the number of farms headed by women increased by 9 and 13 percentage points, respectively, between the 1990s and the decade of the 2000s.

Several authors view the mass integration of rural women into the workplace –in all job categories– as a response to the globalization and liberalization of the economy. This development has affected the most vulnerable sectors, which have fewer links to markets and lower levels of education. The increase in the number of women involved in farming could be part of a new trend in family survival strategies. Whereas entire families previously migrated to urban areas, it could be that men are migrating to the cities to seek work while

Table 23. Contribution of FA to the production of different commodities in selected Latin American countries (percentage of production)

	Argentina (a)	Bolivia (d)	Brazil (b)	Chile (c)	Colombia (d)	Ecuador (d)	Paraguay (a)	Uruguay (a)
Crop								
Rice		70	34					
Bananas							93	
Coffee			38					
Sugarcane							53	
Annual crops				44	30			
Beans			70				94	
Fruit trees				23				38
Vegetables		45		54		(onion) 85	(tomato) 97	80
Maize		70	46			70		
Potatoes		(nearly) 100				64		
Wine				29				27
Yucca		(nearly) 100	87				94	
Livestock								
Beef cattle	26			54				25
Sheep	25			42		83		
Goats	82			94				
Porcino	64		59	12			80	
Milk	33	40	58				55	27

Source: (a) REAF 2010. (b) Instituto Brazileiro de Geografia e Estatística 2009. (c) INDAP–Qualitas Agroconsultores 2009. (d) Schejtman 2008.

the women remain behind to manage the farm. However, there are probably several explanations for this phenomenon: it may also be influenced by the desexualization of labor, which, on an objective level, is facilitated by the growing mechanization of production processes and, on a subjective level, by the cultural changes occurring in societies.

- **High concentration of ethnic populations.** Quantitative data confirms that indigenous or native groups usually account for the majority of subsistence family farmers. In Ecuador, for example, 25% of farms with less than five hectares of land are headed by indigenous people, whereas only 14% run farms of other sizes. In Chile, the pattern is similar: indigenous people operate 23% and 3% of the subsistence family farms and consolidated farms, respectively, versus 1% of medium-sized and large farms (INDAP-Qualitas Agroconsultores 2009). This pattern is probably repeated in other countries with large indigenous populations, such as Bolivia and Peru, where the indigenous population accounts for 43% and 73% of rural dwellers, respectively.

  In several LAC countries, indigenous communities have become increasingly vulnerable as a result of megaprojects for the building of roads, production facilities and energy infrastructure. Such projects have led to the displacement of entire communities from their territories, even though they often have title to the land and their ownership is recognized by the State.

- **Ageing heads of farms.** As in other subregions, the average age of heads of farm households is approximately 55, with a fairly homogeneous distribution in FA. Despite the limited information available, it is fair to assume that the slow process of generational change implies the ageing of the heads of farm households. In Chile, for example, the average age of heads of family farm households increased from 55 to 58 between 1997 and 2007.

4.2. Constraints and challenges

4.2.1. Technological level

In general, FA yields are estimated to be 30%-50% lower than those obtained in mechanized agriculture. In Paraguay, for example, 87% of small-scale sugarcane producers report yields of less than 60 tonnes/ha, while large-scale, mechanized producers can exceed 100 tonnes/ha; similarly, 94% of small-scale cassava producers obtain yields of less than 13 tonnes/ha, whereas some large producers can achieve more than 30 tonnes/ha by simply using better crop management practices (Gattini 2011). However, while some comparative studies have been conducted on yields and technology levels in specific areas and projects, few studies systematize this information at the regional and national levels. This gap makes it difficult to specify and accurately assess the technological status of FA.

4.2.2. Market access

Another major problem faced by FA is its precarious integration into markets. In Chile, for example, only 11,700 out of the 255,000 farms that comprise this segment are exporters (5% of the total), 22,600 sell to agroindustry (9% of the segment) and 7,900 are involved in contract agriculture (3% of the total) (INDAP-Qualitas Agroconsultores 2009).

One traditional way of addressing this obstacle and improving market access has been to create producers' organizations, especially cooperatives. However, new approaches have recently emerged to improve the marketing of FA products. One of these aims to link family farms with agroprocessors that are already integrated into the market, converting family farmers into suppliers of raw materials for agroindustry.

Examples of the production chain model include the productive alliances implemented by INDAP in Chile (82 projects in 2011, with 4400 families) and the Ministry of Agriculture and Rural Development in Colombia (127 projects in 2011, with 7188 families). Both focus on providing technical assistance to small-scale suppliers.

Another emerging trend are so-called 'short circuits,' a form of commerce based on direct sales of fresh or seasonal products, with little or no intermediation between family farmers and consumers. 'Short circuits' bring farmers and consumers together and promote human interaction. The fact that the produce is not transported over long distances or packaged means that the environmental impact is minimal. The boom in 'short circuits' is due basically to growing demand from consumers who want local, authentic, healthy and seasonal produce. At the same time, family farmers are trying to generate greater value from their production by making savings in other links of the chain (transport, packaging, others) and create value based on non-material assets (brands, culture, regional/local roots, authenticity, social ties).

'Short circuits' are an emerging trend in LAC, evident mainly in the establishment of bio-fairs and ecological or organic markets, such as those in Loja and Cuenca in Ecuador or *Red Ecovida* in Brazil. There are also a number successful experiences among small-scale producers who supply food to supermarkets in Chile (for example, Walmart) and in Colombia (e.g., *Proyecto Semilla* in Nariño). In the area of public-sector food purchases, there are programs in Ecuador and Peru, although the most emblematic example is Brazil's Zero Hunger Program. This program purchases FA food products to supply the country's public schools, in compliance with a law that requires public schools to purchase at least 30% of their food for school meals directly from FA or related organizations (cooperatives, agro-industries). In Peru, privately operated businesses such as the *Alianza Cocinero-Productor* (Cook-Producer Alliance), promoted by the Peruvian Gastronomy Association, are also important for FA producers.

4.3. Public policies

4.3.1. The needs of producers' organizations

In response to demands from family farmers' organizations for the implementation of specific public policies for the FA sector, in 2004 the Specialized Meeting on Family Farming (REAF) was set up under the aegis of MERCOSUR. The REAF brings together the leading FA organizations of Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay.

The REAF's actions are based on the principle of solidarity and seek to maximize the complementarity of the FA sector by systematizing information, analyzing specific opportunities and discussing the results obtained in each country and in MERCOSUR as a whole. The idea is to build consensus in order to make recommendations and design actions and programs with political and technical support. The basic objectives are to strengthen public policies for family farmers in MERCOSUR and facilitate trade in FA production, based on principles of solidarity and complementarity, seeking to reduce asymmetries and promote the region's development. The REAF has emerged as a forum for political dialogue between governments and organizations that represent FA in MERCOSUR, with the aim of building consensus, designing and implementing differentiated policies to reduce asymmetries, guaranteeing food and nutritional security, overcoming poverty and social exclusion, and fostering a new pattern of socioeconomic development (see Text Box 20).

4.3.2. Response by governments

Governments have recognized the importance of implementing specific public programs for the FA sector. The FF population (Table 24)

and its economic contributions (Table 22) have been defined using different instruments:

- **PROINDER in Argentina.** The Small Farmer Development Project was created in 1998 to improve the living standards of 40,000 poor rural farming families and temporary agricultural laborers through the funding of projects involving agricultural production or related activities, and to improve institutional capabilities at the national, provincial and local levels for the design and implementation of rural development policies. The second stage of this project was launched in 2007, incorporating a further 22,000 farming families. This phase was financed by the World Bank, through the International Bank for Reconstruction and Development (IBRD) and was implemented by the Secretariat of Agriculture, Livestock, Fisheries and Food (SAGPyA) in the country's 23 provinces, using a decentralized approach. The Socioeconomic Inclusion in Rural Areas Project is currently being formulated with the aim of expanding the actions of PROINDER.

- **Agro Rural in Peru.** The Rural Agricultural Production Development Program was established in 2008 as the Executing Unit of the Under-ministry of Agriculture of MINAG. This new program emerged from the fusion of a number of pre-existing programs such as PRONAMACHCS, PROABONOS, PROSAAMER, MARENAAS, ALIADOS, the Puno Cuzco Corridor, the Sierra Norte Project and the Sierra Sur Project. Initially, it encompassed around 1000 rural districts of Peru, with 200 offices and sub-offices located in 20 departments. In 2012, the initiative benefited 158,032 smallholder families in poor rural areas, addressing issues such as water management, credit, insurance, forestation and the implementation of business and marketing plans.

Box 20. Policy priorities established by the MERCOSUR Specialized Meeting on Family Farming (REAF).

- Recognition and identification of FA.
- Policies for rural youth: promoting access to land for young people in FA, incorporating rural youth into production, addressing gender and youth issues and rural education.
- Policies on gender equality: institutionalization of policies on gender equality, equal land rights, characterization of women's participation in FA production chains, inclusion of women in national registers, productive organization of rural women.
- Access to land and agrarian reform: social role of property, access to land for women and rural youth, internationalization, concentration and use of land.
- Agricultural insurance, risk management: training for technical officers and farmers, exchanges among national bodies, promotion of bilateral agreements, definition of common parameters on risk management in FA in MERCOSUR.
- Trade facilitation: income generation and aggregation of value, trade facilitation, efforts to encourage organizations to complement each other's production, FA's increased share of trade, identification and certification of FA products, promotion of associations and cooperatives.
- Credit and funds for FA.

Source: Prepared by author, based on REAF 2010.

- **PRONAF in Brazil.** The National Program to Strengthen Family Farming was launched in 1995 by the Institute of Colonization and Agrarian Reform (INCRA), and transferred to the newly created Ministry of Agrarian Development (MDA) in 2000. PRONAF's policies specifically target the most vulnerable sectors and include subsidized credit,

extension services and training, as well as infrastructure to support economic activities, add value to primary production and support marketing (through financing and access to price guarantee programs). PRONAF currently offers climate insurance and is also linked to the Food Purchase Program that promotes the purchase of FA products by various public-sector institutions (schools and others). During the second half of the 2000s, PRONAF supported the social inclusion of over 600,000 family farmers per year. The volume of program resources also increased significantly: between the 2002-2003 and 2005-2006 farming seasons the amount rose from USD 816 million to USD 3253 million.

- **INDAP in Chile.** The Agricultural Development Institute (INDAP) in Chile, established in 1962 and part of the Ministry of Agriculture, is responsible for promoting and supporting the productive and sustainable development of FA. INDAP offers a credit program, agricultural insurance and has various technical assistance programs (including technical services, PRODESAL, production partnerships and development programs in indigenous territories). It also has programs to promote irrigation (Law 18,450), investment (PDI), rural tourism and soil rehabilitation (SIRD), among other lines of action. In 2013, this institution served 135,000 producers, with an annual budget of approximately USD 420 million.

- **The General Directorate of Rural Development (DGDR) in Uruguay.** The DGDR, a unit of the Ministry of Livestock, Agriculture and Fisheries (MGAP), is responsible for coordinating and promoting the design and implementation of a development strategy for FA. It coordinates the Uruguay Rural Project (PUR), which has provided technical assistance and support for micro-capitalization to over 3000 beneficiaries, through 50 rural extension projects and 120 field officers who work alongside organized producers. This department also coordinates the Responsible Production Project (PPR), which has implemented 2380 projects on natural resources and biodiversity management and 635 drought prevention projects, with 150 field officers contracted on a part-time basis. Finally, the DGDR coordinates the Livestock Program, whose team of 18 technical officers has trained more than 3000 beneficiaries in aspects of animal health and traceability.

  In addition, the General Farm Directorate (DIGEGRA) is tasked with supporting small farm production (vegetables, fruit, wine, flowers and small livestock). It was established in 2007 to replace the National Farm Board (JUNAGRA) as the body responsible for implementing development programs in this sector. For its part, the Farm Reconstruction and Development Fund (FRFG) provides reimbursable and non-reimbursable funds for training activities for technical officers and producers and offers technical assistance for business plans linked to agro-processing chains.

Most of these programs have differentiated policies for specific segments of FA that recognize the essential distinction between subsistence agriculture and small-scale commercial agriculture. This distinction aside, the technical issues addressed in each segment are more or less the same, though the tools and methods employed may vary.

Table 24. Operational definition of FA in some countries of the region.

Country	Legal framework or study	Definition
Argentina	Study, PROINDER-IICA 2007	Family agriculture is defined as follows: • The producer works directly on the farm. • Does not employ non-family remunerated labor on a permanent basis. • Establishes a ceiling for farm size and capital by region. Excludes limited companies/corporations.
Brazil	Law 11326 (2006) amended by Law 12512 of 2011, available at http://www.planalto.gov.br/ccivil_03/_Ato2004–2006/2006/Lei/L11326.htm	A family farmer is defined as someone who carries out agricultural activities in: • An area no larger than four fiscal modules, under any title, (agrarian unit for each region of the country). A fiscal module ranges from 5 hectares to 110 hectares, depending on the area and factors such as soil conditions, gradient and access. • Predominantly uses family labor in the economic activities of his farm or enterprise. • Farm earnings contribute a minimum to the family income (modification in 2011). • Operates his farm or business with his family.
Colombia	Law 160 of 1994, National System of Agrarian Reform and Rural Development	A family farm unit (FFU) is defined as: The basic unit for agricultural, livestock, aquaculture and forestry production, whose size, depending on the agro-ecological conditions of the area and using appropriate technology, allows the family to receive a return for its work and obtain surplus capital that contributes to the formation of its assets. The operation of the FFU shall not normally require more than the work of the owner and his/her family, although external labor may be employed if the nature of the farm so requires. The Board of Directors shall establish methodological criteria for determining the size of a FFU, dividing the country into relatively homogeneous zones; the mechanisms for evaluation, review and periodic adjustments, when significant changes occur that affect the conditions of the farm; and the maximum value of a FFU that may be purchased under this law, calculated in minimum monthly salaries.
Chile	Organic Law of the Agricultural Development Institute No. 18910, amended by Law 19213	This law defines family farmers as those who: • Farm an area smaller than 12 hectares of basic irrigation (standard unit of area). • Have assets valued at less than 3500 development units (approximately USD 170,000). • Obtain their income mainly from farming. • Work directly on the land, under any tenure system.
Paraguay	Law 2419 of the National Institute for Rural Development and Land	FA is defined as follows: • The family home must be located on the farm or in a nearby community. • The farm size for FA is 50 hectares in the Región Oriental and 500 hectares in the Región Occidental. The definition established by the REAF is under discussion. • The family provides the basic labor force for the farm. • Hired labor is limited to 20 temporary workers hired during specific periods of the production cycle.
Uruguay	Official Resolution for the definition of family production of the Ministry of Livestock, Agriculture and Fisheries (2008).	Family production is defined as: • Work is carried out with a maximum of two permanent paid workers, or the equivalent in daily wages (500 days' wages per year). • Farm is no more than 500 hectares in size (CONEAT 100 index), under any form of tenure. • Main income is obtained from working on farm, or working time is mainly devoted to the farm. • Family lives on the farm or no further than 50 km away.

Source: IICA, based on FAO 2012.

5. Policy recommendations

Many countries in the region have undoubtedly taken important steps in creating conditions that will favor FA and have realized the enormous potential the sector has for eradicating poverty and hunger. The challenges that these countries must face in the near future could be eased to some extent by implementing the following policy recommendations:

Generate information in order to characterize FA and design relevant and effective policies

With few exceptions, the lack of information on small-scale agriculture is one of the main obstacles to assessing the sector's true potential in the region. It is essential to have objective and continuous records that demonstrate FA's potential contribution to national economies, poverty reduction and the improvement of food security. Countries must work together to create information systems (e.g., farmers' registers and agricultural censuses) that enable them to characterize FA, as soon as possible, in order to define typologies of producers, their main needs and gaps in competitiveness. This will make it possible to measure economic and social aspects, and design agricultural policies and development actions suited to the characteristics and needs of this sector.

Build an institutional framework for the development of subsistence FA

In view of the specific characteristics of FA and in order to make a greater impact on the sector, the countries should create or consolidate a specific institutional framework (public policies, institutions and programs) that contemplates the sector's socioeconomic and agro-ecological heterogeneity. Several LAC countries are already building this type of institutional platform, which has helped to overcome the asymmetries that affect the functioning of this segment. Implementation of such a platform calls for the following actions:

Text Box 21. Outlook for FA in South America.

- **Consolidation of institutional mechanisms.** One of the main challenges facing FA in South America is the need to strengthen institutions specializing in support and development work. Some countries have consolidated institutions, others (such as Colombia) implement programs targeted at FA without necessarily having a specialized institution, and yet others are working to strengthen aspects that specifically target this sector. Cases in point are the Food Production Development Program for FA in Paraguay and Ecuador's National Program for Inclusive Rural Businesses (PRONERI).

- **Emergence of new tools for development.** In addition to institutional systems devised to support FA, new development instruments are emerging that combine a wide range of tools to support the sector. For example, many countries are introducing climate and price insurance schemes for farmers, while others are creating new technical assistance programs that prioritize horizontal relationships among producers (Peru, Chile). Other innovations of interest include the public purchase programs for FA (Brazil, Peru, Ecuador), and the rapid development of linkages between small-scale producers and medium and large-scale businesses (Colombia, Bolivia, Chile and Ecuador).

- **Participation of FA in value chains.** Specific instruments are being used to improve FA's participation in value chains, also known as productive partnerships in many countries, including public purchasing programs. At the same time, so-called 'short circuits' or short supply chains are being developed with

a view to establishing direct links between small-scale producers and consumers, through movements such as the Cocinero-Campesino partnerships in Peru, and eco-fairs, internet sales, on-farm consumption (agro-tourism) and by directly supplying supermarkets. All these schemes have emerged more or less spontaneously, and pose a great challenge for government policymaking.

- **ICT and improvements in infrastructure are redefining the rural milieu.** All countries are increasingly using information and communication technologies (ICT) as a management tool. Along with advances in infrastructure (roads, electricity, drinking water, etc.), ICT make it possible to restructure rural areas. One of the most significant manifestations of this trend is the growing mobility of rural dwellers, who travel from their farms to cities and nearby towns every day, either to meet the needs of their own farms, or to work in non-agricultural activities, which play an important role in complementing their incomes.

- **Access to land and natural resource management.** Access to land continues to be a major problem in many LAC countries (Bolivia, Brazil, Colombia, Paraguay and Venezuela). This is reflected in the agrarian reform programs currently under way, as well as in land-titling initiatives and efforts to improve irrigation, along with other complementary measures. In addition, protection of the environment has become a crucial component of agricultural development strategies. This challenge is systemic in nature and encompasses the entire sector, which means that FA must also rise to it. To this end, many countries have implemented area-based development strategies that seek to improve the efficacy of public and private programs. This approach will create opportunities for social innovation that will eventually have a strong impact on the design of public policies.

- **Integration of FA into the global economy.** Many countries in this subregion have signed FTAs with other countries and extra-regional blocs, or are in the process of doing so. These negotiations open up new opportunities for FA, but they also impose new production standards and increased levels of competition, both in domestic and external markets. This process poses an enormous challenge for FA, which must be addressed through well-designed and properly implemented public policies, as well as through public-private programs that enable actors from all sectors to work together to tackle this issue, which is national in scope. In this way, each country will be able to create new synergies that are essential for effective integration into the global economy.

- **Design of a differentiated policy for each segment of producers.** Creating differentiated policies requires calls for different approaches, depending on the situation in each country and in each segment of producers (IICA 2012). This will make it possible to distinguish between the needs of the poorest strata and groups of small-scale producers that already have links with markets. While the former mainly require support to obtain work in rural areas, improve household consumption and contribute to their family's food security, the latter need improved access to land and credit, access to markets and technology, and the promotion of associativity. Incorporating this diversity into the design of policies and programs is crucial.

- **The area-based approach as a key element in the implementation of policies.** Designing differentiated and flexible policies and programs calls for a local or area-based approach (*enfoque territorial*), in which development strategies are adapted to the socio-productive characteristics and

infrastructure existing in each place targeted. Governments should progressively adopt this approach when planning development strategies for FA, a challenge that is even more complex in countries with a centralized system, as is the case in most countries of the subregion. Applying an area-based approach will particularly benefit the subsistence sector, given its limited potential for agricultural development.

- **Complement policies with specific institutional designs for FA.** Countries should establish institutional frameworks suited to the development needs of small-scale agriculture, with human and budget resources that are consistent with the challenges facing this sector, as well as evaluation and feedback systems for measuring results. A number of successful experiences in the region could serve as examples for the establishment of institutions and programs relevant to the situation in the Caribbean.

Organize the development of agricultural production as a component of rural development, adopting multi-sectoral strategies

The development of FA calls for sector-specific policies and programs, but this is not enough. In LAC, the challenge is complex. Different types of problems must be addressed, many of which are beyond the scope of agricultural institutions (ECLAC *et al.* 2012). A comprehensive State vision is needed for the development and coordination of intersectoral policies and strategies for the development of agriculture, incorporating those designed by other sectors that affect the development of FA. Therefore, the strategies devised must include infrastructure and social investment initiatives that effectively support policies and programs for the development of agricultural production. Off-farm productive investments (road works, irrigation systems, electrification, telecommunications, etc.) and social investments (schools, hospitals, housing and others) are crucial to improve the socio-productive situation of rural households and the social integration of small-scale farmers.

Training and retaining the next generation

To encourage young people to remain in the countryside, governments must offer them living conditions similar to those found in the areas to which they migrate. Comprehensive efforts are therefore needed to improve rural public goods, such as the construction of schools, hospitals, roads and housing, as key factors to encourage young people to make plans for a life in the countryside. This must be accompanied by policies that specifically target rural youth and are primarily aimed at enhancing their performance and improving the sustainability of their farms. Of particular importance are policies that improve access to land, infrastructure and credit, and strategies for promoting access to, and the use of ICT, in agriculture. These will help to encourage young people to become involved in agriculture and facilitate information management for decision-making.

Reorienting innovation systems for FA

Innovation and technology systems will not have a positive impact on the constraints faced by FA as long as national innovation systems continue to adopt the 'supply-side technology' approach. This approach must be reoriented toward the development of innovation systems with the active involvement of family farmers, based on the sector's real and specific needs, to ensure that innovation systems are relevant to the development of FA.

Creating an environment that stimulates innovation will require strategies ranging from training human resources in new approaches to technological and institutional development and innovation, to promoting interactions among all actors within a production chain and a territory.

An innovation system for FA must be based on knowledge management and the exchange of traditional know-how, along with appropriate connections with modern technology. It is important to emphasize that innovation systems for FA must acknowledge the role played by the market in guiding agricultural innovation and include this as a criterion for evaluating their impact.

Adapting FA to climate change, an action that is vital to ensure the sector's continuity

Climate change is expected to have a major impact on the region's agriculture, and its effects will potentially be accentuated in Central America and the Caribbean. Several countries have already implemented systems for managing and adapting to climate change; however, these have primarily focused on urban areas. It is essential to strengthen these policies by designing specific measures to enable FA to adapt to new climate scenarios. It is also vital that countries focus their efforts on agricultural R&D and innovation, in order to develop new production systems and species resistant to difficult climatic conditions, and promote the sustainable use of natural resources and the use of early warning systems for climate-related threats.

Strengthening associativity and partnerships: the key to improving integration into markets

Promoting the effective participation of family farmers in value chains would ensure greater recognition by the market of their products' value added, and increase their income from the sale of their produce. Strengthening associativity among the actors involved in FA would create economies of scale that would not only reduce the costs of directly accessing markets, but also improve the management of their enterprises. To accomplish this goal, it is vital to design new policy tools with the active participation of the public and private sectors, thereby strengthening organizational and marketing capabilities in the areas where FA is concentrated. It is also essential to identify and assess new market niches that are willing and able to buy FA products, in order to subsequently develop production and business management skills among groups of farmers.

Another vital element for linking farmers to markets is the close coordination of public and private actors, in order to improve and develop inclusive marketing services and tools, such as the public and institutional food purchasing programs, contract agriculture, commodity exchanges, local markets, farmers' fairs and other types of 'short circuits.'

6. Conclusions

- A review of the situation in the three subregions of LAC confirms that FA is the predominant type of agriculture in all the countries of the region. The continued existence of FA as a unique type of economic activity that co-exists with medium- and large-scale commercial agricultural enterprises is a universal feature. There are many similarities between countries and, therefore, many lessons to be learned.

- FA is one the economic activities with the greatest potential for improving food security and sovereignty, generating employment and reducing poverty. However, its contributions have long been undervalued by governments and society. The fact that the UN has declared 2014 the International Year of Family Farming should help position the sector as a priority for LAC governments.

- Developing the potential of FA necessarily entails commitments by governments to establish a specific institutional framework for the sector, in order to promote its sustainable development. This calls for the gathering of information on the sector to support the design of policy tools geared to farmers' needs. Effective 'customized' tools

can only be developed with the active participation of family farmers in their design and implementation.

- The institutional framework must be sufficiently solid to ensure that it accomplishes its purpose; i.e., it must have, at least, sufficient human and financial resources, evaluation and feedback systems and long-term and differentiated policies for each segment. Several LAC countries already have specific institutions for the FA sector, which are mainly under the responsibility of the agriculture portfolio, with dissimilar results. In this regard, the sharing of experiences and the replication of good practices are actions that could usefully be implemented in the short term.

- Policies should be applied in the context of rural area-based development processes. This calls for the design and implementation of intersectoral strategies and actions that produce synergies for the advancement of FA and, therefore, make public administration more effective in local communities. The structural features of FA call for multidimensional strategies, in which agricultural policies are complemented with the inclusion of extra-sectoral public policies. Together, these can improve the quality of life of rural inhabitants. It will be up to governments to implement such strategies, which will determine the future of the region's FA and the opportunities for overcoming the hunger and poverty that have affected some territories in recent decades.

- In many countries, it is clear that the migration of young people to areas that offer better opportunities poses a major risk to the continuation of FA. The sustainability of FA production systems depends on young people remaining in rural areas, so governments must design comprehensive strategies to encourage young people and their families to make agriculture their livelihood. Given the ageing and declining rural population in the region, the next generation of family farmers will have little incentive to continue to work in the sector unless immediate actions are taken.

- In much of the region, income from non-agricultural activities has become an increasingly important part of the family farmers' economy during the last decade, underscoring the fragility of their production systems, especially those of the most vulnerable segments. This could result in the progressive abandonment of agricultural production activities, with the consequent risk to food security.

- FA is highly developed in some Southern Cone countries, largely because their governments have recognized its value and have adopted differentiated policies and established a specific institutional framework for the sector. More specifically, the creation of the Specialized Meeting on Family Farming (REAF) offers a unique mechanism for public-private dialogue in the Southern Cone, with a methodology that could be replicated in other countries.

- Throughout the region, limited access to land and water resources is one of the main obstacles hindering the sustainable development of FA. Many LAC countries still do not have policies or measures to facilitate access to land for family farmers. Overcoming the inequalities that afflict FA is a pressing challenge for the countries. Without production resources, there is no agriculture.

- Although associativity offers advantages for promoting the sector's participation in various institutions of interest and helps to address the challenges of market insertion and business management more effectively, this has not been a priority for many governments in LAC. However, countries that have supported associativity have unders-

tood the benefits of having organizations that are strengthened by seeing their needs met. The situation of FA in the region reflects the need for this measure, which countries should implement in the short term.

- Market integration is unquestionably one of the main challenges that must be addressed for FA to develop as required. Some countries have worked to overcome or mitigate market asymmetries and inequities that negatively affect the sector. For example, Brazil has incorporated family agriculture into the market through the public food-purchasing program. This strategy of including FA as a supplier of food programs is a good practice that should be replicated in the region.

- In recent years, groups of countries have been working together for the development of FA –the MERCOSUR countries through the REAF, for example. This approach, which has been widely endorsed, fosters greater participation and dialogue among family farmers. In the near future, other joint actions may be undertaken by countries to build capacity and open markets to benefit the sector. This task poses a number of challenges: improving productivity, overcoming problems of quality and safety, establishing specific protocols, creating product differentiation seals, brands, etc., all of which could undoubtedly be addressed by the countries working together. The pooling of efforts would contribute to the development of a solid FA sector in Latin America, and more just and equitable societies with higher levels of well–being.

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Statisctical Appendix

Table A1. Global growth projections
Annual rate of GDP growth, in real terms, by country group

Countries	IMF				
	2010	2011	2012	2013	2014
World	5.2	3.9	3.1	3.1	3.8
Advanced economies	3.0	1.7	1.2	1.2	2.1
United States	2.4	1.8	2.2	1.7	2.7
Euro Zone	2.0	1.5	-0.6	-0.6	0.9
Emerging economies	7.6	6.2	4.9	5.0	5.4
China	10.4	9.3	7.8	7.8	7.7
Latin America & the Caribbean	6.1	4.6	3.0	3.0	3.4
Countries	World Bank				
	2010	2011	2012	2013	2014
World	4.0	2.8	2.3	2.2	3.0
World (PPP /a)	5.1	3.8	2.9	3.1	3.8
Advanced economies	2.9	1.7	1.3	1.2	2.0
United States	2.4	1.8	2.2	2.0	2.8
Euro Zone	2.0	1.5	-0.5	-0.6	0.9
Developing countries	7.5	6.0	5.0	5.1	5.6
China	10.4	9.3	7.8	7.7	8.0
Latin America & the Caribbean	5.9	4.4	3.0	3.3	3.9
Countries	DAES - United Nations				
	2010	2011	2012	2013	2014
World	4.0	2.8	2.3	2.3	3.1
Advanced economies	2.6	1.4	1.2	1.0	2.0
United States	2.4	1.8	2.2	1.9	2.6
Euro Zone	2.1	1.4	-0.6	-0.4	1.1
Developing countries	7.7	5.8	4.6	5.0	5.4
China	10.3	9.2	7.8	7.8	7.7
Latin America & the Caribbean	6.0	4.3	3.0	3.6	4.2

/a Purchasing power parity
Source:
IMF, World Economic Outlook Abril 2013 and Update July 2013
World Bank, Global Economic Prospects June 2013
DAES-UN, World Economic Situation and Prospects 2012 and Update mid-2013

Table A2. Growth Projections in the Americas
Annual rate of GDP growth, in real terms, by country

Countries	ECLAC				IMF				
	2010	2011	2012a	2013b	2010	2011	2012a	2013b	2014b
Antigua & Barbuda	-7.1	-2.8	2.3	2.4	-8.5	-3.0	1.6	1.7	3.2
Argentina	9.2	8.9	1.9	3.5	9.2	8.9	1.9	2.8	3.5
Bahamas	1.0	1.7	1.8	3.0	0.2	1.6	2.5	2.7	2.5
Barbados	0.2	0.6	0.2	0.7	0.2	0.6	0.0	0.5	1.0
Belize	3.9	2.3	5.3	2.7	2.7	1.9	5.3	2.5	2.5
Bolivia (Plurinational State of)	4.1	5.2	5.2	5.5	4.1	5.2	5.2	4.8	5.0
Brazil	6.9	2.7	0.9	2.5	7.5	2.7	0.9	3.0	4.0
Canada	na	na	na	na	3.2	2.6	1.8	1.5	2.4
Chile	5.8	5.9	5.6	4.6	5.8	5.9	5.5	4.9	4.6
Colombia	4.0	6.6	4.0	4.0	4.0	6.6	4.0	4.1	4.5
Costa Rica	5.0	4.4	5.1	3.0	4.7	4.2	5.0	4.2	4.4
Cuba	2.4	2.8	3.0	3.0	na	na	na	na	na
Dominica	1.2	1.0	-1.5	1.4	0.7	1.9	0.4	1.3	1.5
Dominican Republic	7.8	4.5	3.9	3.0	7.8	4.5	3.9	2.2	3.4
Ecuador	2.8	7.4	5.0	3.8	3.3	8.0	5.0	4.4	3.9
El Salvador	1.4	2.0	1.6	2.0	1.4	2.0	1.6	1.6	1.6
Grenada	-0.4	1.0	-0.8	1.2	-0.4	1.0	-0.8	0.5	1.0
Guatemala	2.9	4.2	3.0	3.0	2.9	4.1	3.0	3.3	3.4
Guyana	4.4	5.4	4.8	4.8	4.4	5.4	3.3	5.5	6.0
Haiti	-5.4	5.6	2.8	3.5	-5.4	5.6	2.8	6.5	6.3
Honduras	3.7	3.7	3.3	3.0	3.7	3.7	3.3	3.3	3.0
Jamaica	-1.5	1.3	-0.3	0.5	-1.4	1.5	0.1	0.6	1.3
Mexico	5.3	3.9	3.9	2.8	5.3	3.9	3.9	3.4	3.4
Nicaragua	3.6	5.4	5.2	5.0	3.6	5.4	5.2	4.0	4.0
Panama	7.5	10.8	10.7	7.5	7.5	10.8	10.7	9.0	7.2
Paraguay	13.1	4.3	-1.2	12.5	13.1	4.3	-1.2	11.0	4.6
Peru	8.8	6.9	6.3	5.9	8.8	6.9	6.3	6.3	6.1
Saint Kitts & Nevis	0.2	1.7	-1.1	2.5	0.0	-1.9	-0.9	1.9	3.2
Saint Vincent & the Grenadines	-3.4	-0.7	1.5	1.1	-2.3	0.4	0.5	1.0	2.0
Saint Lucia	0.2	1.4	-3.0	2.7	0.2	1.4	-0.4	1.1	2.2
Suriname	4.1	4.7	4.4	4.5	4.1	4.7	4.5	4.5	4.5
Trinidad & Tobago	0.2	-2.6	1.2	2.0	0.2	-2.6	0.4	2.0	2.5
Uruguay	8.9	6.5	3.9	3.8	8.9	5.7	3.8	3.8	4.0
United States	na	na	na	na	2.4	1.8	2.2	1.9	3.0
Venezuela (Bolivarian Rep. of)	-1.5	4.2	5.6	1.0	-1.5	4.2	5.5	0.1	2.3
Latin America and the Caribbean	5.6	4.3	3.0	3.0	6.1	4.6	3.0	3.4	3.9

a Estimations
b Projection
Source: ECLAC (Economic Commission for Latin America & the Caribbean): Economic Survey of Latin America and the Caribbean 2013
IMF: International Monetary Fund, World Economic Outlook Database, April 2013

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 products									
	2009	2010	2011	2012	2009	2010	2011	2012	2009	2010	2011	2010	2011	2012
Argentina	6.3	10.5	9.8	10.0	2.8	14.4	8.7	10.3	132.7	154.5	172.5	6090.3	7182.7	6400.8
Bahamas	2.1	1.1	3.2	1.9	4.8	-0.5	2.2	2.2	na	na	na	861.5	666.6	520.0
Barbados	3.6	5.8	7.9	6.0	6.7	3.7	8.2	7.0	na	na	na	0.0	0.0	na
Bolivia (Plurinational State of)	3.3	2.5	9.9	4.5	3.9	3.4	14.0	4.1	138.8	170.5	200.3	671.8	858.9	525.2
Brazil	4.9	5.0	6.6	5.4	5.8	6.1	8.8	8.1	112.9	140.4	159.7	36917.0	67690.0	66136.5
Chile	1.5	1.5	3.3	3.0	5.4	2.8	6.9	7.5	123.0	148.7	157.2	6142.0	5476.9	4863.7
Colombia	4.2	2.3	3.4	3.2	4.4	1.4	4.7	4.1	139.3	154.7	196.3	184.0	5545.7	13771.4
Costa Rica	7.8	5.7	4.9	4.5	9.5	5.2	5.7	4.7	125.8	136.9	142.6	1440.9	2098.9	2200.0
Cuba	-1.2	1.3	1.3	1.6	na	na	na	na	na	na	na	na	na	na
Dominican Republic	1.4	6.3	8.5	3.7	3.9	4.3	8.7	5.1	97.4	103.4	106.9	1896.3	2371.1	3771.1
Ecuador	5.2	3.6	4.4	5.1	6.1	4.9	6.6	6.4	120.5	137.7	158.5	161.4	640.4	578.1
El Salvador	0.5	0.9	5.1	1.7	-3.8	0.3	6.9	0.3	98.9	107.1	115.2	116.6	385.5	257.6
Guatemala	1.9	3.9	6.2	3.8	1.4	3.8	11.1	7.1	118.9	128.5	136.7	782.3	967.5	1063.9
Haiti	0.0	5.7	8.4	6.3	-2.6	5.0	10.2	6.6	122.6	104.8	113.8	150.0	181.0	124.3
Honduras	5.5	4.7	6.8	5.2	3.6	1.9	6.1	3.0	87.0	97.5	107.5	970.6	996.7	1058.7
Jamaica	9.6	12.6	7.5	6.9	12.9	12.8	7.7	10.8	na	na	na	169.5	180.3	na
Mexico	5.3	4.2	3.4	4.1	8.7	3.9	5.1	7.6	94.9	116.5	126.7	5911.3	8684.6	-4730.1
Nicaragua	3.0	5.9	8.5	7.5	3.5	4.4	9.4	8.9	135.3	158.7	178.9	508.0	967.9	858.8
Panama	2.4	3.5	5.9	5.7	5.8	2.9	5.9	8.1	147.6	149.6	177.1	2350.1	2789.8	2822.9
Paraguay	2.6	4.7	8.3	3.7	1.5	8.4	13.4	-0.6	168.5	219.2	247.4	339.7	483.4	239.4
Peru	2.9	1.5	3.4	3.7	4.2	2.5	4.9	5.6	122.2	143.1	168.7	7062.4	8119.3	9641.2
Saint Lucia	-0.2	3.3	2.8	4.2	na	na	na	na	na	na	na	110.0	75.8	138.1
Suriname	-0.1	6.9	17.7	5.0	na	na	na	na	na	na	na	-247.7	72.9	66.3
Trinidad & Tobago	7.0	10.5	5.1	9.3	12.6	22.8	9.8	19.1	na	na	na	549.4	1110.0	1688.2
Uruguay	7.1	6.7	8.1	8.1	6.1	6.9	9.7	8.7	145.1	165.3	177.7	2348.8	2628.7	2767.9
Venezuela (Bolivarian Rep. of)	28.6	29.1	27.1	21.1	28.7	34.6	29.6	24.5	96.8	103.3	134.6	-1462.0	4875.0	-758.5

Source: CEPAL: ECLAC (Economic Commission for Latin America & the Caribbean): Own estimations based on official sources, information revised as of August 2013.

Table A4. Gross domestic product & agriculture value added

Countries	Gross Domestic Product per capita (constant 2005 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 (%)		
	2009	2010	2011	2012	2009	2010	2011	2012	2010	2011	2012
Antigua & Barbuda	12,414	11,409	10,976	11,121	1.6	1.8	1.9	1.9	1.7	4.0	2.7
Argentina	5,808	6,286	6,784	6,854	7.1	8.3	7.6	6.6	28.0	-2.2	-11.1
Bahamas	22,170	22,094	22,182	22,325	2.1	2.1	1.9	1.7	4.4	-9.2	-9.0
Barbados	14,812	14,817	14,869	14,866	1.7	1.6	1.5	na	-6.1	-6.3	na
Belize	4,027	4,099	4,112	4,244	11.4	11.9	11.2	12.2	6.9	-4.3	20.3
Bolivia (Plurinational State of)	1,167	1,196	1,239	1,284	13.2	12.6	12.4	12.4	-1.2	3.1	4.1
Brazil	5,222	5,533	5,636	5,639	5.5	5.5	5.6	5.4	6.3	3.9	-2.3
Chile	8,217	8,611	9,034	9,453	4.3	4.1	4.3	4.1	0.3	11.9	-0.3
Colombia	3,842	3,939	4,143	4,251	7.5	7.2	7.0	6.9	0.2	2.4	2.6
Costa Rica	5,180	5,359	5,519	5,725	8.5	8.6	8.4	8.3	6.7	1.1	3.5
Cuba	4,791	4,907	5,045	5,198	3.8	3.5	3.6	3.4	-6.0	4.4	-1.1
Dominica	6,194	6,284	6,355	6,263	13.0	11.9	12.3	12.3	-8.1	5.3	-0.3
Dominican Republic	4,485	4,769	4,919	5,046	7.2	7.1	7.2	7.3	5.5	5.5	4.1
Ecuador	3,206	3,244	3,428	3,541	9.6	9.5	9.4	9.1	1.6	5.4	1.2
El Salvador	2,925	2,950	2,991	3,023	11.5	11.7	11.2	11.3	3.1	-2.5	2.6
Grenada	6,413	6,367	6,403	6,326	5.7	5.4	5.4	5.9	-6.5	-1.3	9.5
Guatemala	2,262	2,271	2,311	2,322	12.8	12.4	12.5	12.7	-0.2	5.0	4.9
Guyana	2,071	2,157	2,270	2,374	21.0	20.6	20.0	19.8	2.3	2.7	3.7
Haiti	467	436	454	461	na	na	na	na	na	na	na
Honduras	1,503	1,529	1,555	1,575	13.2	13.0	13.3	13.9	1.8	5.8	8.1
Jamaica	4,112	4,034	4,070	4,042	7.0	7.1	7.7	7.9	-0.3	9.8	2.6
Mexico	7,673	7,986	8,202	8,427	3.5	3.4	3.3	3.3	4.1	-1.5	6.7
Nicaragua	1,226	1,254	1,304	1,353	17.5	18.5	18.5	17.9	9.8	4.3	1.0
Panama	5,956	6,291	6,856	7,462	5.3	4.2	3.8	3.6	-14.2	-0.6	4.4
Paraguay	1,553	1,726	1,771	1,722	18.1	21.6	21.3	17.0	34.2	3.7	-20.1
Peru	3,562	3,833	4,052	4,259	6.8	6.5	6.4	6.3	3.8	5.7	4.1
Saint Kitts & Nevis	11,243	11,129	11,179	10,926	1.1	1.1	1.3	1.2	2.4	11.4	-7.5
Saint Lucia	6,125	6,075	6,098	5,854	4.1	3.3	3.1	3.7	-18.2	-6.5	19.1
Saint Vincent & the Grenadines	5,565	5,375	5,338	5,419	7.5	6.3	6.2	6.2	-18.2	-0.6	0.8
Suriname	3,403	3,617	3,752	3,884	6.6	7.2	7.2	7.2	15.8	4.3	5.2
Trinidad & Tobago	14,131	14,106	13,692	13,815	0.3	0.6	0.6	0.6	76.8	-0.1	-4.9
Uruguay	6,276	6,815	7,238	7,498	8.6	7.6	8.1	7.7	-3.6	12.4	-1.6
Venezuela (Bolivarian Rep. of)	6,199	6,011	6,166	6,409	3.8	3.9	3.7	3.6	0.9	-1.1	2.3
Latin America and the Caribbean	5,279	5,515	5,691	5,798	5.3	5.4	5.3	5.1	6.4	2.2	-0.2
Latin America	5,254	5,493	5,671	5,779	5.4	5.4	5.3	5.1	6.5	2.2	-0.3
The Caribbean	7,392	7,368	7,331	7,374	3.6	3.7	3.8	4.1	3.7	3.4	3.2

Source: ECLAC (Economic Commission for Latin America & the Caribbean): Own estimations based on official sources, information revised as of August 2013.

Table A5. Gross domestic product & agriculture value added

Countries	Proportion occupied population in agriculture 1		Labour insertion of the economically active rural occupied population 2, 3, 4 (percentages)									
	Percentage of the population occupied		Employers		Agricultural salaried employment		Non-agricultural salaried employ-ment		Agricultural self-employment		Non-agricultural self-employment	
	2000	2011	1999/00	2011	1999/00	2011	1999/00	2011	1999/00	2011	1999/00	2011
Bolivia (99-11)	37.1	30.2	1.2	3.9*	2.7	3.8*	6.4	11.9*	82.1	70*	7.5	10.4*
Brazil (99-11)	19.7	15.3	2.0	1.9	15.6	15.4	18.6	21.8	56.4	52.8	7.3	8.1
Chile (00-11)	13.0	9.7	2.4	1.9	40.2	32.4	26.5	40.1	22.8	13.7	8.1	11.9
Colombia (99-11)	23.0	17.7	3.7	4.9	25.9	22.7	21.3	13.1	27.9	37.9	21.2	21.4
Costa Rica (99-11)	19.4	14.1	8.2	3.3	21.3	22.6	47.9	49.6	9.5	10.5	13.1	14.0
Dominican Republic (02-11)	16.6	14.5	1.7	2.1	5.5	6.1	31.1	34.0	35.0	28.1	26.7	29.6
Ecuador (00-11)		27.9		3.3		22.6		18.3		43.9		12.0
El Salvador (99-11)	20.5	21.1	4.1	3.1	20.2	20***	30.5	28.6***	26.3	28.1***	18.8	20.2***
Guatemala (98-06)	37.2	30.6****	2.0	1.9**	26.6	16**	16.3	21.6**	34.8	40**	20.2	20.6**
Honduras (99-11)	34.0	36.2	3.1	1.3***	16.4	16.8***	17.1	15.5***	41.3	45.3***	22.1	21.1***
Mexico (02-11)	17.5	13.3	3.3	13.9***	15.7	15.8***	36.7	45.9***	25.4	11.6***	18.9	12.7***
Nicaragua (02-11)	32.4	33.5	3.3		23.7	20.4*	20.0	15.6*	39.7	50.5*	13.3	12.1*
Panama (02-11)	21.1	17.0	2.0	2.0	14.2	13.2	25.8	31.0	39.3	35.9	18.7	17.9
Paraguay (99-11)	30.8	25.5	3.4	3.4	7.2	7.9	19.8	24.7	54.0	49.5	15.6	14.4
Peru (99-11)	35.2	26.5	6.4	4.7	8.5	9.2	8.9	11.8	62.2	61.5	12.0	12.8
Uruguay (11)		10.1		11.1		25.9		23.8		29.9		9.3
Venezuela	10.2	7.9										

Source:
1/ ECLAC, Annual Statistics 2012
2/ ECLAC, Panorama Social 2012 (based on data from household surveys in the respective countries)
3/ Reference age of 15 years for the EAP
4/ Year closest to the head of the column.

Notes:
* Last year available is 2009
** Last year available is 2006
*** Last year available is 2010
**** Last year available is 2005

Table A6. Poverty, extreme poverty & median incomes

Countries[1]	"Incidence of poverty and extreme poverty[2] (18 countries) (percentages)"								"Average monthly household income (17 Countries) (multiples of the poverty line)"			
	Total Poverty[3]		Poverty in Rural Areas		Total Extreme Poverty[3]		Extreme Poverty in Rural Areas		Urban Areas		Rural Areas	
	2003/05	2011	2003/05	2011	2003/05	2011	2003/05	2011	2003/05	2012	2003/05	2012
Argentina[5] (04-12)	29.4				11.1				9.0	22.8		
Bolivia (04-11)	63.9	42.4*	80.6	61.5*	34.7	22.4*	58.8	43*	6.8	8.0**	2.9	5.5**
Brazil (05-12)	36.4	20.9	53.2	36.1	10.6	6.1	22.1	14.9	10.8	14.0	6.3	9.1
Chile (03-11)	18.7	11.0	20.0	8.7	4.7	3.1	6.2	3.8	13.9	14.3**	11.1	13.1**
Colombia (05-12) b/	45.2	34.2	56.6	46.2	21.2	13.9	28.0	22.2	8.3	9.0	6.2	5.7
Costa Rica (05-12)	21.1	18.8	22.7	19.6	7.0	7.3	9.0	9.5	10.7	12.0	9.8	10.5
Dominican Republic (05-12)	47.5	42.2	51.4	44.9	24.6	20.3	28.8	24.7	7.9	7.7	6.2	5.9
El Salvador (04-12)	47.5	46.6***	56.8	55.8***	19.0	16.7***	26.6	23.5***	6.7	5.8	5.2	5.1
Ecuador (05-12)	48.3	35.4	54.5	41.4	21.2	13.9	29.2	21.3	7.4	7.9	5.8	6.3
Guatemala (06)												
Honduras (03-10)	74.8	67.4***	84.8	76.5***	59.3	42.8***	69.4	56.8***	5.6	5.8***	3.1	4.4***
Mexico (05-12)	35.5	36.3***	47.5	42.9***	11.7	13.3***	21.7	21.3***	8.9	7.5	7.1	6.4
Nicaragua (05-09)	61.9	58.3*	71.5	65.4*	31.9	29.5*	46.1	40.9*	7.3	6.0*	5.3	5.3*
Panama (05-12)	31.0	25.3	47.2	43.6	14.1	12.4	27.5	26.8	11.1	12.1	7.1	7.5
Paraguay (05-11)	56.9	49.6	61.6	59.3	27.6	28.0	35.9	42.1	5.9	7.0**	4.9	5.9**
Peru[4] (03-12) c/	52.5	27.8	75.2	56.1	21.4	6.3	44.6	20.5	7.5	10.6	3.5	5.4
Uruguay (05-12)	18.8	6.5		4.1	4.1	1.1		0.6	8.1	10.7		11.0
Venezuela (05-12)	37.1	29.5			15.9	11.7				8.8		
Latin America 4 (05-11)	39.8	29.4	59.8	49.8	15.4	11.5	33.3	28.8				

Source: ECLAC, Panorama Social 2012 (based on data from household surveys in the respective countries)
1/ Year closest to the head of the column.
2/ Includes people below the indigence line or in a situation of indigence (extreme poverty)
3/ Data from Argentina & Uruguay corresponds to Total Urban Areas
4/ Estimation for 18 countries of the region and Haiti.
5/ Buenos Aires

Notes:
* Last year available is 2009
** Last year available is 2011
*** Last year available is 2010

Table A7. Annual growth in trade by sector

Countries	Crops				Livestock				Fishing				Forestry			
	Exports (%)		Imports (%)		Exports (%)		Imports (%)		Exports (%)		Imports (%)		Exports (%)		Imports (%)	
	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12
Antigua & Barbuda													0.0	0.0	0.0	0.0
Argentina	10.7	12.2	-4.1	2.7	18.6	5.8	-14.5	15.1	-1.2	3.0	-6.7	13.9	16.5	1.7	-2.6	8.0
Bahamas		-38.1		2.3		-42.9		1.8		-4.7		2.9	55.2	5.9	2.9	1.9
Barbados	4.5	5.0	5.6	4.7	7.1	-9.3	6.5	4.4	-0.9	-7.8	8.8	4.1		74.3	-5.4	-0.2
Belize	11.5	0.2	1.2	8.0	29.6	-32.1	0.5	3.9	24.0	-3.7	-3.6	-21.8	-7.2	23.2	-10.8	-1.5
Bolivia (Plurinational State of)	10.1	14.6	-1.1	10.9	2.5	15.1	-4.2	16.7			-19.6	24.3	9.7	-3.1	3.5	10.9
Brazil	17.4	16.0	-3.3	15.6	31.8	9.2	-13.0	24.6	11.1	-7.7	-1.1	19.6	13.3	5.1	0.8	8.8
Canada	7.2	10.6	9.2	8.2	4.7	3.0	2.5	9.2	5.7	2.6	3.8	6.8	2.6	-4.6	4.3	-1.0
Chile	8.8	12.3	6.6	11.9	35.3	8.7	14.5	21.0	10.2	3.0	16.0	14.3	10.3	6.2	13.5	6.3
Colombia	7.1	7.4	6.1	14.2	28.7	-28.0	-11.3	18.0	-1.7	1.0	10.5	15.5	13.5	4.4	6.5	3.7
Costa Rica	5.6	5.6	7.4	11.8	10.3	12.1	1.5	18.1	-0.8	4.8	9.5	12.7	9.3	12.3	5.6	3.6
Cuba	-10.1		14.5		6.2		14.7		-1.7		6.1		6.5	87.0	3.6	-10.5
Dominica	-7.2	-9.5	0.1	9.3		-22.7	1.8	9.9	50.7	-53.5	2.2	4.7	12.5	-9.0	-15.9	19.0
Dominican Republic		10.9		12.6		15.8		8.2		27.3		14.1	20.1	33.9	0.4	6.2
Ecuador	10.1	13.7	16.4	13.9	-18.8	33.3	16.0	17.8	9.5	11.5	20.1	69.3	24.0	2.5	7.4	14.0
El Salvador	0.3	8.7	8.7	6.3	-0.6	11.1	6.0	12.4	26.8	0.1	39.0	1.9	9.2	21.3	2.8	6.3
Grenada	-9.8	27.7	3.4	17.1	-17.5	119.7	4.3	16.7	-2.3	-11.0	4.2	8.5			0.0	0.0
Guatemala	2.7	15.8	13.6	12.5	4.3	14.6	10.0	9.6	-3.8	32.0	29.9	20.7	19.6	5.2	7.8	8.8
Guyana	6.3	8.6	6.0	16.8	9.6	5.5	6.0	9.9	2.9	-5.4	-10.9	3.9	1.0	-4.3	14.9	5.0
Haiti														72.9	0.7	24.2
Honduras	-1.6	27.8	-0.6	29.0	20.9	56.0	7.6	41.9	32.0	-37.1	21.5	11.4	-1.4	-1.0	11.7	5.1
Jamaica	0.0	1.7	6.9	13.9	-1.7	4.3	4.5	3.6	-3.5	-4.7	5.9	1.5	-20.7	50.4	0.0	-3.2
Mexico	7.9	8.7	8.7	7.6	6.6	12.5	6.2	4.5	-2.0	4.4	21.2	1.0	7.8	3.8	8.9	0.9
Nicaragua	5.8	17.2	4.1	16.2	13.8	32.3	-4.4	12.4	3.4	9.8	-12.1	9.5	-3.3	4.8	9.3	11.8
Panama	3.5	6.4		24.5	1.2	-7.0		16.9	11.0	-19.4		16.2	26.3	12.5	5.1	0.4
Paraguay	16.6	18.7	-3.8	18.5	23.3	14.5	-1.8	19.1	27.3	-36.1	-2.3	29.0	-3.6	11.7	14.7	15.1
Peru	16.3	18.9	10.5	16.6	45.2	15.5	3.3	14.8	7.0	10.6	18.7	42.4	11.0	-1.8	12.7	14.6
Saint Kitts & Nevis	-24.5	3.6	-0.2	5.7	-12.4	3.4	4.2	5.2	-4.5	17.7	1.1	-4.0	0.0	0.0	0.0	0.0
Saint Lucia	-0.8		4.8				6.5		-60.5		8.4				0.0	-0.8
Saint Vincent & the Grenadines	-6.1	-2.9	1.9	10.4	16.4	22.8	7.0	5.1	-14.6	5.4	9.4	-1.5	58.5	56.8	-24.4	2.1
Suriname													-7.5	27.3	20.7	11.8
Trinidad & Tobago	3.5	-9.6	13.0	3.4	-8.5	7.3	5.4	10.9	-6.6	-2.4	22.2	8.9	4.0	41.0	11.2	0.1
United States	4.6	10.8	8.4	7.6	-1.8	12.2	5.3	1.9	6.1	5.2	4.5	3.9	1.5	4.7	5.6	-7.7
Uruguay	11.0	27.4	-5.4	18.6	17.0	11.6	15.0	13.6	5.8	4.3	8.2	10.6	17.9	27.8	-4.8	8.5
Venezuela (Bolivarian Rep. of)	-9.2	-30.2	1.8	15.0	-30.0	41.0	14.8	24.2	-14.8	-12.4	-3.6	13.5	0.4	-28.1	0.7	4.2

Source: Instituto Interamericano de Cooperación para la Agricultura sobre la base de información oficial de Naciones Unidas (COMTRADE) y FAO (FAOSTAT).

Note: BHS, BLZ, COL, CRI, GUY, NIC, PAN, PER, DOM, KNA, VCT, VEN, the last period is 2006/11
For DMA, JAM, TTO the last period is 2006/10.
For GRD, the last period is 2006/2008
For HND the last period is 2006/2007.

Table A8. Participation of sector exports in total exports of goods (Annual growth, percentages)

Countries	Crops		Livestock		Fishing		Forestry	
	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12	2000/05	2006/12
Antigua & Barbuda								
Argentina	1.5	2.8	8.8	-3.1	-9.4	-5.7	6.80	-6.83
Bahamas		-40.4		-45.1		-8.4		2.50
Barbados	2.5	0.1	5.0	-13.5	-2.9	-12.1		66.12
Belize	8.9	-4.9	26.6	-35.6	21.1	-8.6	-9.37	22.32
Bolivia (Plurinational State of)	-4.5	-2.0	-11.1	-1.6			-4.86	-17.06
Brazil	0.5	5.6	12.8	-0.6	-4.9	-15.9	-3.09	-4.26
Canada	1.3	8.8	-1.1	1.4	-0.1	1.0	-2.98	-6.14
Chile	-6.8	6.5	16.0	3.0	-5.5	-2.4	-5.49	0.62
Colombia	-2.9	-6.8	16.8	-37.5	-10.8	-12.3	2.98	-8.17
Costa Rica	-0.8	0.8	3.6	6.9	-6.8	-0.1	2.73	7.42
Cuba	-17.0		-1.9		-9.2		-1.65	
Dominica	-3.2	-5.0		-18.9	57.2	-51.2	17.27	-8.13
Dominican Republic		15.0		20.2		32.0		38.07
Ecuador	-5.2	3.7	-30.1	21.6	-5.7	1.7	6.77	-4.83
El Salvador	-4.3	-11.3	-5.2	-9.3	20.9	-18.3	4.18	-0.99
Grenada	9.9	16.3	0.5		19.0	-18.9		
Guatemala	-9.2	-0.8	-7.7	-1.8	-14.9	13.2	5.87	-9.82
Guyana	4.5	-1.5	7.8	-4.4	1.2	-14.2	-0.70	-13.97
Haiti								
Honduras	-3.3	0.5	18.7	22.6	29.6	-50.5	-3.18	-17.78
Jamaica	-3.5	16.2	-5.1	19.2	-6.9	8.9	-23.44	89.71
Mexico	2.5	2.3	1.3	5.9	-7.0	-1.8	2.40	-2.35
Nicaragua	-1.4	-1.9	6.0	10.8	-3.7	-8.1	-9.95	-13.63
Panama	0.0	-39.7	-2.3	-47.4	7.2	-54.4	21.97	-37.46
Paraguay	0.9	-5.7	6.7	-9.0	10.2	-49.3	-16.59	-11.25
Peru	-3.5	6.6	20.5	3.6	-11.2	-0.8	-7.84	-8.09
Saint Kitts & Nevis	-27.2	3.3	-15.5	3.1	-7.9	17.3	-3.54	-0.34
Saint Lucia	-11.9				-64.9			
Saint Vincent & the Grenadines	-1.1	-1.7	22.6	24.3	-10.1	6.7	66.92	70.70
Suriname								
Trinidad & Tobago	-10.5	-1.4	-20.9	17.1	-19.3	6.5	-10.08	67.60
United States	1.4	4.4	-4.9	5.7	2.7	-0.9	-1.69	-1.36
Uruguay	1.4	11.9	6.9	-2.0	-3.4	-8.4	7.71	12.22
Venezuela (Bolivarian Rep. of)	-19.2	-33.2	-37.7	34.9	-24.2	-16.2	-10.69	-35.84

Source: Inter-American Institute for Cooperation on Agriculture (IICA) based on information from the United Nations (COMTRADE) & FAO (FAOSTAT).

Note: BHS, BLZ, COL, CRI, GUY, NIC, PAN, PER, DOM, KNA, VCT, VEN, the last period is 2006/11
For DMA, JAM, TTO the last period is 2006/10.
For GRD, the last period is 2006/2008
For HND the last period is 2006/2007.

Table A9. Annual cumulative rate of production growth by sector, percentages

Countries	Crops		Livestock		Aquaculture 1		Forestry 2	
	2000-2005	2006-2011	2000-2005	2006-2011	2000-2005	2006-2011	2000-2005	2006-2011
Antigua & Barbuda	-2.00	4.28	-2.56	2.25	11.30	-7.48		
Argentina	3.80	2.46	0.27	-0.01	0.16	-7.35	10.75	2.69
Bahamas	-1.72	0.20	3.34	2.14	1.71	2.34	0.00	0.29
Barbados	-4.39	-5.99	3.46	0.41	-6.80	2.23	11.92	0.00
Belize	-0.21	-4.30	9.72	0.76	-12.19	41.70	0.00	1.07
Bolivia (Plurinational State of)	5.25	1.66	4.47	7.71	2.55	3.84	3.17	0.64
Brazil	5.30	7.45	5.27	3.54	3.32	6.24	1.66	1.83
Canada	3.03	0.53	1.23	0.04	2.36	-2.97	0.87	-5.04
Chile	2.38	1.48	3.13	1.02	3.25	-4.80	4.22	1.24
Colombia	2.80	-6.45	2.86	2.18	-2.54	-2.08	-2.69	1.63
Costa Rica	1.82	-1.53	1.78	3.02	0.36	2.04	-2.47	-0.96
Cuba	-12.11	2.61	-6.11	6.41	-10.73	-3.30	8.55	-5.26
Dominica	-4.70	1.76	-2.97	3.88	-14.60	0.87		0.00
Dominican Republic	2.08	2.88	2.42	0.64	-1.00	2.40	0.15	0.81
Ecuador	2.92	2.69	14.38	4.15	-4.06	5.69	3.28	4.39
El Salvador	-0.77	8.61	2.51	-0.56	32.84	0.56	-1.69	0.07
Grenada	-2.72	-0.30	1.51	1.75	2.29	1.41		
Guatemala	5.77	3.27	6.93	2.21	-12.97	4.38	2.11	2.04
Guyana	1.63	-0.70	8.93	3.28	2.39	-3.49	3.31	-1.02
Haiti	1.26	2.98	1.68	2.16	6.33	11.36	0.33	0.37
Honduras	9.06	4.50	5.33	-0.02	16.33	-12.66	0.22	-1.28
Jamaica	-4.30	-3.71	2.12	-0.02	10.28	-7.17	-0.90	-4.12
Mexico	2.07	-0.75	2.38	1.51	-0.38	1.96	-0.38	-0.58
Nicaragua	4.23	4.40	3.60	4.17	4.48	5.33	0.31	0.65
Panama	1.20	0.49	1.15	3.91	-0.87	-8.66	0.05	-0.74
Paraguay	8.88	5.14	1.65	3.74	-13.97	10.83	1.01	1.03
Peru	0.80	4.41	3.72	5.51	-1.21	-2.14	-0.04	-1.35
Saint Kitts & Nevis	-6.17	1.86	-1.52	2.09	-1.41			
Saint Lucia	-8.96	-3.64	7.02	3.94	-6.38	5.24		0.00
Saint Vincent & the Grenadines	2.75	3.99	-2.26	3.58	-45.63	49.57		-3.01
Suriname	-3.64	4.02	2.71	5.09	5.78	3.17	0.42	11.33
Trinidad & Tobago	-17.99	-33.74	6.01	3.24	1.66	1.37	-2.74	-4.75
United States	1.58	0.66	0.94	0.92	0.94	-0.22	0.27	-7.33
Uruguay	9.11	8.44	2.81	1.35	3.07	-9.45	15.36	11.63
Venezuela (Bolivarian Rep. of)	1.14	-0.35	-1.10	1.53	5.03	-7.73	2.72	-1.46

Source: Inter-American Institute for Cooperation on Agriculture (IICA) based on official FAO information (FAOSTAT). FISGSTAT FAO. Available at: http://www.fao.org/fishery/topic/16140/en.

1/ Capture and aquaculture production taken from inland and marine waters.
2/ Comprises all wood obtained from extraction operations in forests and in other areas during the current period year or forestry period).

Table A10. Land use in the Americas by category (1,000 ha)

Countries	Total land area *	Total Agri-culture Area (TAA) *	Arable Land & Permanent Crops (ALPC)*	% ALPC/TAA	Grazing Land and Grass-lands (GLG) *	% GLG/TAA	Forest area*	Protected areas **
Antigua & Barbuda	44	9	5	0.6	4	0.4	10	
Argentina	273,669	147,548	39,048	0.3	108,500	0.7	29,160	
Bahamas	1,001	15	13	0.9	2	0.1	515	
Barbados	43	15	13	0.9	2	0.1	8	21515***
Belize	2,281	157	107	0.7	50	0.3	1,383	
Bolivia (Plurinational State of)	108,330	37,055	4,055	0.1	33,000	0.9	56,888	
Brazil	845,942	275,030	79,030	0.3	196,000	0.7	517,328	
Canada	909,351	62,597	47,894	0.8	14,703	0.2	310,134	801
Chile	74,353	15,789	1,774	0.1	14,015	0.9	16,269	
Colombia	110,950	43,786	3,998	0.1	39,788	0.9	60,398	17,067
Costa Rica	5,106	1,880	580	0.3	1,300	0.7	2,628	70,530
Cuba	10,644	6,570	3,940	0.6	2,630	0.4	2,905	
Dominica	75	26	24	0.9	2	0.1	44	
Dominican Republic	4,832	2,447	1,250	0.5	1,197	0.5	1,972	3163,6***
Ecuador	24,836	7,346	2,535	0.3	4,811	0.7	9,667	14,335
El Salvador	2,072	1,532	895	0.6	637	0.4	283	14,509
Grenada	34	11	10	0.9	1	0.1	17	331
Guatemala	10,716	4,395	2,445	0.6	1,950	0.4	3,601	
Guyana	19,685	1,677	447	0.3	1,230	0.7	15,205	
Haiti	2,756	1,770	1,280	0.7	490	0.3	100	42
Honduras	11,189	3,220	1,460	0.5	1,760	0.5	5,072	
Jamaica	1,083	449	220	0.5	229	0.5	337	
Mexico	194,395	103,166	28,166	0.3	75,000	0.7	64,647	
Nicaragua	12,034	5,146	2,130	0.4	3,016	0.6	3,044	3,089
Panama	7,434	2,267	729	0.3	1,538	0.7	3,239	
Paraguay	39,730	20,990	3,990	0.2	17,000	0.8	17,403	
Peru	128,000	21,500	4,500	0.2	17,000	0.8	67,842	
Saint Kitts & Nevis	26	6	5	0.9	1	0.2	11	
Saint Lucia	61	11	10	0.9	1	0.1	47	
Saint Vincent & the Grenadines	39	10	8	0.8	2	0.2	27	
Suriname	15,600	82	65	0.8	17	0.2	14,754	18,700
Trinidad & Tobago	513	54	47	0.9	7	0.1	226	
United States	914,742	411,263	162,763	0.4	248,500	0.6	304,405	1,356
Uruguay	17,502	14,378	1,846	0.1	12,532	0.9	1,789	
Venezuela (Bolivarian Rep. of)	88,205	21,250	3,250	0.2	18,000	0.8	45,987	
America	3,837,273	1,213,446	398,532	0.3	814,914	0.7	1,557,345	
LAC + Mexico	2,013,180	739,587	187,875	0.3	551,711	0.7	942,806	255,839

***Source:** FAO, FAOSTAT (2011).
**** Source:** ECLAC, CEPALSTAT (2007; *** 2006).