A Glance at Member Countries of the

Mesoamerica Integration and Development Project

Document prepared for the

XVII CUMBRE
DE JEFES DE ESTADO Y DE GOBIERNO
DEL MECANISMO DE DIÁLOGO Y CONCERTACIÓN

TUXTLA
HONDURAS 2019

San Pedro Sula, Honduras • 21st to 23rd August

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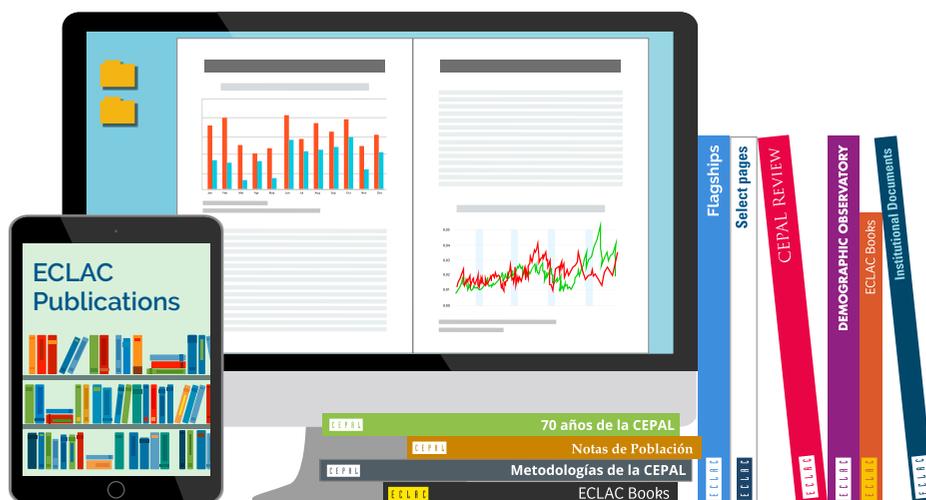
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MESOAMÉRICA

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Explanatory notes:
- The dot (.) is used to separate the decimals and the comma (,) to separate the thousands in the text.
- The word "dollars" refers to United States dollars, unless otherwise noted.
- The information presented was based on the most recent official, public and comparable data available for the ten countries that make up the Mesoamerica Integration and Development Project.

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Table of Contents

Boxes

Diagrams

Maps

Abstract/Resumen

This document is a contribution of the Economic Commission for Latin America and the Caribbean (ECLAC) to the information collection and the deliberations of the "XVII Summit of Heads of State and Government of the Tuxtla Mechanism of Dialogue and Cooperation". ECLAC, as a member of the Interinstitutional Technical Group, ratifies its commitment with regional integration. Furthermore, this third edition of the document "A glance at member countries of the Mesoamerica Integration and Development Project" (2012 and 2015), underlines its support for the integration and development activities carried out by the Mesoamerica Integration and Development Project (MP). This view offers a concise panorama of the economic, social and environmental reality of the Mesoamerican region. The document summarizes the main challenges and opportunities found in the different components of the MP portfolio: economic development; trade and investment; competitiveness, small and medium enterprises and information and communication technologies; logistics and mobility; energy; health; nutrition and food security; housing; and environment, disaster risk management and climate change. These challenges can be tackled more easily through regional coordination and cooperation and are reminders of the importance of coordinating strategies with regional integration institutions and national policies.

El presente documento constituye un aporte de la Comisión Económica para América Latina y el Caribe (CEPAL) al acervo informativo y a las deliberaciones de la "XVII Cumbre de Jefes de Estado y de Gobierno del Mecanismo de Diálogo y Concertación de Tuxtla". La CEPAL, como integrante del Grupo Técnico Interinstitucional, ratifica su compromiso con la integración regional. Asimismo, manifiesta su apoyo a las actividades de integración y desarrollo del Proyecto de Integración y Desarrollo de Mesoamérica (PM) mediante esta tercera edición del documento "Una mirada a los países del Proyecto de Integración y Desarrollo de Mesoamérica", publicado en 2012 y 2015. Esta mirada ofrece un panorama conciso de la realidad económica, social y ambiental de la región mesoamericana. El documento es de carácter informativo y resume los principales retos y oportunidades en los distintos componentes de la cartera del PM: desarrollo económico; comercio e inversión; competitividad, pequeñas y mediana empresas y tecnologías de información y comunicación; logística y movilidad; energía; salud; seguridad alimentaria y nutricional; vivienda; y medio ambiente, gestión de riesgo de desastres y cambio climático. Estos retos pueden abordarse más fácilmente desde la cooperación y la concertación regional, recordándose la importancia de la coordinación de estrategias con la institucionalidad de la integración centroamericana y las políticas nacionales.

Acronyms and Abbreviations

CABE	Central American Bank for Economic Integration
CAF	Development Bank of Latin America
CARICOM	Caribbean Community
CENAPRED	National Center for Disaster Prevention
CRIE	Regional Electricity Interconnection Commission
EAP	Eastern Asia and the Pacific
ECLAC	Economic Commission for Latin America and the Caribbean
EE	Energy Efficiency
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GCR	Global Competitiveness Report
GDP	Gross Domestic Product
GHG	Greenhouse gases
GWh	Gigawatt-hour
HDII	Human Development Index Inequality
HLZ	Holdridge Life Zones
IADB	Inter-American Development Bank
ICG	Global Competitiveness Index
ICT	Information and Communication Technologies
IDEAM	Institute of Hydrology, Meteorology and Environmental Studies
IPCC	Intergovernmental Panel on Climate Change
Km	Kilometre

LAC	Latin America and the Caribbean
LUC	Land use change
MCCA	Central American Common Market
MER	Regional Electricity Market
MP	Mesoamerica Integration and Development Project
MSMEs	Micro, small and medium enterprises
NCD	Non-communicable diseases
OECD	Organization for Economic Co-operation and Development
PAHO	Pan American Health Organization
PBI	Potential Biodiversity Index
PES	Payment for environmental services
REDD	Reducing Emissions from Deforestation and Forest Degradation
SDG	Sustainable Development Goal
SICA	Central American Integration System
SIEPAC	Electrical Interconnection System of Central American Countries
SMEs	Small and Medium Enterprises
TWh	Terawatt-hour
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
WHO	World Health Organization

Introduction

The Mesoamerica Integration and Development Project (MP) is an integration and development platform made up of the ten countries that are part of the Tuxtla Dialogue and Coordination Mechanism: Belize, Colombia, Costa Rica, El Salvador, Honduras, Guatemala, Mexico, Nicaragua, Panama and the Dominican Republic. In this area of work and dialogue, development priorities are agreed upon, and jointly, through regional working groups, projects are designed and executed for the countries' inclusive economic and social progress.

The Economic Commission for Latin America and the Caribbean (ECLAC), as a member of the Interinstitutional Technical Group of the MP, supports the development cooperation process undertaken by the Mesoamerican countries through the MP. ECLAC prepares studies and data with a Mesoamerican perspective that are useful for decision-making by the MP and its members, thus providing the public with a framework for understanding ongoing cooperation and regional interaction with Mesoamerican parameters.

The MP brings together various cooperation initiatives of the participating governments, accompanied by the efforts of multilateral organizations, both international and regional, including the Organs of the Central American Integration System (SICA). In addition to the funds provided by the countries, the Central American Bank for Economic Integration (CABEI), the Inter-American Development Bank (IADB) and the Development Bank of Latin America (CAF) have also provided financing. Added to this confluence of institutions is the non-financial cooperation of ECLAC, the Food and Agriculture Organization of the United Nations (FAO) and the Pan American Health Organization (PAHO) in response to the demands of the Executive Committee and the Executive Directorate of the MP.

In this context, the MP has deemed it necessary to have statistical information that concisely presents the economic, social and environmental reality of the member countries of the mechanism. For this reason and taking advantage of the XVII Summit of Heads of State and Government of the Tuxtla Gutierrez Mechanism for Dialogue and Concertation in 2019, ECLAC has proposed updating the documents of the *Mesoamerican Project Countries: Economic and Social Trends* (2012) and *A glance at member countries of the Mesoamerica Integration and Development Project* (2015).

This update is also an opportunity to present statistics and data that inform and support the definition of mandates, agreements and lines of work of the MP. Likewise, this document will serve as a base reference for the different policies of the portfolio of sectors served by the MP and will nourish the Mesoamerican academy with a valuable economic, social and environmental radiography.

The document is informative and summarizes in key messages the main elements of the different sectors of the MP portfolio.

The primary target audience is decision-makers in countries, as well as public policy makers, analysts, academics and informants. This document also serves as a source of information for a wide audience and can be used in a variety of institutional interactions.

Mesoamerica: a heterogeneous region with common challenges

The countries participating in the "Mesoamerica Integration and Development Project" represent a significant block in Latin America and the Caribbean (LAC), with 36% of the population and 33.6% of LAC GDP (see figure 1). The progress made by the MP represents a substantial contribution to the continent's socioeconomic improvement.

Figure 1
Latin America and the Caribbean: 2017 GDP compared to Mesoamerica, at current prices
(Billions of dollars and in percentages of total)
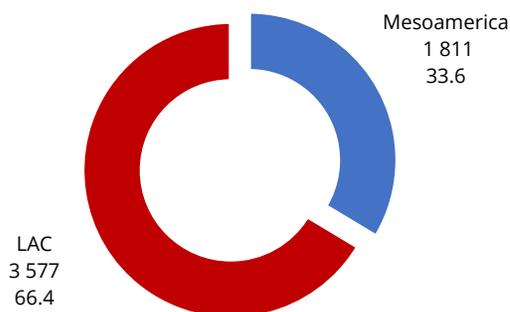
Mesoamerica
1 811
33.6

LAC
3 577
66.4

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.

The MP block of countries shares cultural ties because of the common history forged by its neighbourhood status. Nevertheless, the members of the MP register heterogeneous social and economic dynamics. In this sense, within the Mesoamerican bloc there are three realities that explain different performances in their social and economic indicators. This distinction is mainly based on the size of its population, as well as the size and characteristics of its economies.

A general characterization of the Central American Integration System (SICA) countries —Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and the Dominican Republic— whose characteristics are, despite an important internal diversity, their small size, their high degree of external openness and their great dependence on energy imports, mainly hydrocarbons, as well as on food in general.

Secondly, Colombia has unique characteristics within the bloc as it is a country of great weight due to its population and economy, an economic structure closely linked to the export of raw materials and to being part of the market of the Andean Community of Nations. Finally, Mexico exhibits the largest economy and population of the bloc, with a diversified economic structure around a strong manufacturing and export industrial base. These characteristics are clearly reflected in the size of the population (see figure 2) and GDP (see figure 3).

As for the SICA countries, Guatemala and the Dominican Republic are the largest economies and their GDP represents 46% of the total GDP of that subregion (see figure 4), followed by Panama (19%) and Costa Rica (17%). The smallest economies in the SICA bloc are Belize (1%) and Nicaragua (4%). Averages include El Salvador (7%) and Honduras (7%).

The size of per capita income also helps to understand the differences in the economic structure of the region.

The country with the highest income is almost six times higher than the country with the lowest income. The World Bank classifies MP members in lower-middle-income countries (El Salvador, Guatemala, Honduras and Nicaragua) and upper-middle-income countries (Belize, Colombia, Costa Rica, Mexico, Panama and the Dominican Republic) (see figure 5).

Figure 2
Mesoamerica: population in 2018
(Millions of inhabitants)
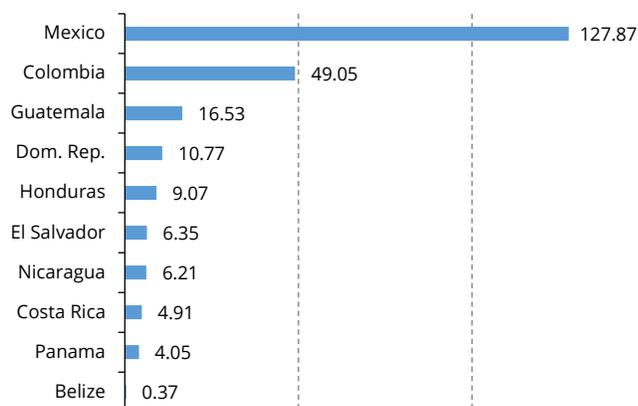
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.
Note: Population data for Colombia corresponds to the National Administrative Department of Statistics and for Honduras to the National Statistics Institute.

Figure 3
Share in Mesoamerica's GDP, 2017
(Percentages of countries relative importance)
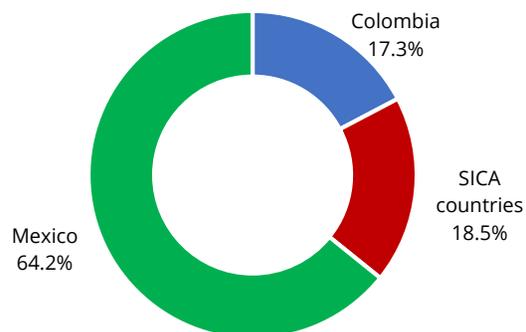
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.

Figure 4
SICA countries: relative weight of GDP by country, 2017
(Percentages of sub regional total)
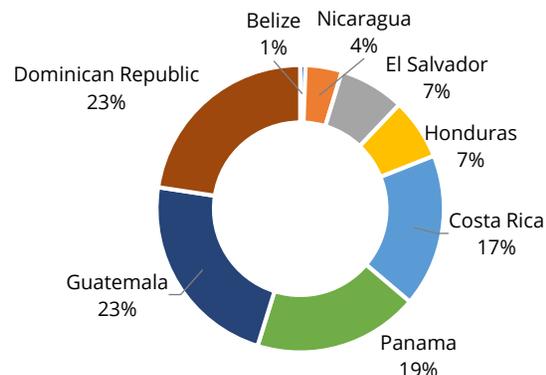
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.

Figure 5
Mesoamerica: 2017 GDP per capita,
constant prices at 2010 prices
(Dollars)
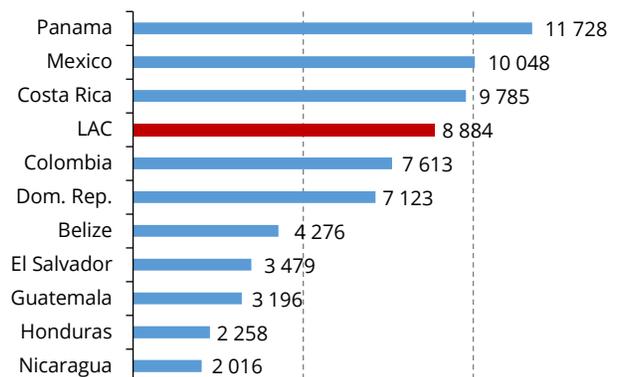
Country	Value
Panama	11 728
Mexico	10 048
Costa Rica	9 785
LAC	8 884
Colombia	7 613
Dom. Rep.	7 123
Belize	4 276
El Salvador	3 479
Guatemala	3 196
Honduras	2 258
Nicaragua	2 016

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.
Note: Data for Honduras corresponds to the Central Bank of Honduras, 2000s constant prices.

While the GDP per capita figure provides a notion of a country's well-being, it does so with limitations, as it does not contain information on the distribution of wealth and other factors affecting human development. Therefore, the data from the Human Development Report prepared by the United Nations Development Programme (UNDP) are considered with a view to better understanding the Mesoamerican reality. According to this classification, Belize, Colombia, Costa Rica, Mexico, Panama and the Dominican Republic are in the group of countries with high human development, while El Salvador, Guatemala, Honduras and Nicaragua are in the medium development category. Within this last group, in the period 2010-2017, Guatemala and Nicaragua show an average growth superior to that of the rest of the members of the MP (see table 1); despite the lag, the differences with respect to their more advanced partners are reduced.

In the 2010-2017 period, the MP countries recorded average annual HDI growth below the average for high and medium human development countries. This data is consistent with that registered in Latin America and the Caribbean, where the region's average annual growth remained below that of the countries with high and medium human development (see table 2).

Table 1
Mesoamerica: Human Development Index (HDI)[1], 2010-2017 and 2012-2017

Country	Ranking	Value	2012-2017 change in positions in ranking	2010-2017 HDI average annual growth (in percentages)
Costa Rica	63	0.794	1	0.74
Panama	66	0.789	-1	0.58
Mexico	74	0.774	-1	0.58
Colombia	90	0.747	2	0.55
Dominican Republic	94	0.736	8	0.66
Belize	106	0.708	-3	0.18
El Salvador	121	0.674	-4	0.07
Nicaragua	124	0.658	3	0.82
Guatemala	127	0.650	4	0.89
Honduras	133	0.617	2	0.50
Latin America and the Caribbean	--	0.758	--	0.51

Source: *United Nations Development Programme (UNDP), Human Development Report, 2018.*

Table 2
HDI average annual growth: results by region and development category

Country clusters	2010-2017 (Percentages)
Countries of high human development	0.76
Countries of medium human development	1.13
Latin America and the Caribbean	0.51
Arab Countries	0.51
East Asia & Pacific	0.83
Europe and Central Asia	0.71
Southeast Asia	1.26
Sub-Saharan Africa	1.09

Source: United Nations Development Programme (UNDP), *Human Development Report*, 2018.

Finally, the Mesoamerican subregion, like the rest of LAC, faces the challenge of overcoming economic inequality. Income inequality between households and individuals has declined significantly since the early 2000s. The simple average of the Gini coefficients of 18 Latin American countries fell from 0.543 in 2002 to 0.466 in 2017. However, the rate of reduction has slowed in recent years: between 2002 and 2008, the average annual decline in the index was 1.3%; between 2008 and 2014, 0.8%; and between 2014 and 2017, 0.3% (ECLAC, 2019).

The MP countries, except for El Salvador and Nicaragua, show significant setbacks in the human development index when adjusted for the level of inequality (see table 3). This negative performance contrasts with data for other countries with similar conditions in other regions of the world.

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[1] The HDI is an index that ranks countries according to their performance in areas considered key to human development: economic development, education and health. The result provides values between 0 and 1, where 0 is the lowest rating and 1 is the highest. Based on this value, countries are classified into four groups: i) Countries with very high human development: HDI greater than 0.80; ii) Countries with high human development: HDI between 0.70 and 0.79; iii) Countries with medium human development: HDI between 0.55 and 0.69, and iv) Countries with low human development: HDI less than 0.54.

Table 3

Mesoamerica: inequality-adjusted human development index HDII and Gini coefficient

Country	Ranking	HDI value	IDHD value	HDI ranking variation adjusting by inequality	Gini coefficient 2010-2017[a]
Costa Rica	63	0.794	0.651	-10	48.7
Panama	66	0.789	0.623	-14	50.4
Mexico	74	0.774	0.609	-13	43.4
Colombia	90	0.747	0.571	-12	50.8
Dominican Republic	94	0.736	0.581	-3	45.3
Belize	106	0.708	0.550	-7	--
El Salvador	121	0.674	0.524	1	40.0
Nicaragua	124	0.658	0.507	0	46.2
Guatemala	127	0.650	0.467	-5	48.3
Honduras	133	0.617	0.459	-4	50.0

Source: United Nations Development Programme (UNDP), *Human Development Report,* 2018.

[a] 0 represents absolute equality, 100 absolute inequality.

Inequality is a multidimensional phenomenon that, in addition to income, affects other key variables for human development: education, health, nutrition, socio-productive resilience, access to new information technologies or the acquisition of durable goods, among others. Associated with inequality, in the analysis of the reality of Mesoamerica the variable "inequity" must be considered. A development approach aimed at combating inequality focuses on improving equality of opportunities and rights, as well as on ensuring that enough income and other basic elements are obtained to escape poverty. The concept of equity refers specifically to groups that are of different status by nature or by social exclusion, denoting the importance of having public policies focused on youth, women, indigenous people, people with disabilities, migrants and rural populations, among others.

The countries of the Mesoamerican Integration and Development Project face multidimensional obstacles to strengthen their economic and social development strategy, which underscores the relevance of the MP's contributions to integration and development. Of special importance are the works of the PM in areas such as the insertion of micro, small and medium enterprises (MSMEs) in intra- and extra regional trade; the consolidation and modernization of the regional transport infrastructure; the creation of a sustainable energy infrastructure that guarantees the supply and access to electric service; the impulse for the conservation of the environment; and the universal access to basic services such as education, telecommunications, health or housing.

The preservation, from a sustainable development perspective, of the region's biodiversity is a matter worth special mention, since in addition to its incalculable global value, the income of large population groups working in the agricultural and tourism sectors depends

on it. Similarly, the geographical position of the region places it in a situation of physical vulnerability to natural hazards such as hurricanes, torrential rains, droughts, fires or earthquakes, among others, which can be exacerbated by socio-economic and environmental vulnerabilities. Consequently, strengthening the capacity to mitigate and adapt to climate change and promoting disaster risk management in the region are also part of the regional working agenda of the Mesoamerican countries. Complementarily, the diversification and sophistication of the productive structure are important tools for the creation of resilience.

The heterogeneity of Mesoamerica entails shared challenges, but with different capacities and achievements, where States that combine rich experiences and diverse programs and solutions for development coexist. This structural diversity and the existence of common challenges create a propitious scenario for maximizing national development efforts through intraregional cooperation.

I. The main economic data

A. Economic balance and outlook

The region is experiencing a moderate recovery after several years of slowing economic activity. Activity bottomed out in 2016, after a two-year contraction, and GDP grew by 1.3% in 2017, with a projected growth of between 2% and 2.5% in 2018. The global economic outlook has improved but is still far from the dynamism of the previous growth cycle. Given lower international commodity prices, stagnant trade expansion and unfavourable financial conditions, the forces that promoted LAC's economic expansion in recent years are no longer enough factors to sustain high rates of growth. This has had repercussions on social conditions and is prolonging the region's longevity in the middle-income trap (OECD, CAF and ECLAC, 2018).

Global growth projections are slightly lower for both 2018 and 2019 and downside risks to these forecasts prevail. In 2018, the global economy expanded by 3.2%. Likewise, in 2018 the synchrony in growth observed in 2017 ended, when the pace of growth accelerated in most countries. In 2018, this acceleration occurred in the United States (2.9%) and India, which grew by 7.4% compared to 6.7% in 2017 (ECLAC, 2019a).

Globalization and technological change are creating new challenges that increase uncertainty among citizens while offering new opportunities. After three decades of increasing openness, world trade and investment flows have slowed. World trade growth in 2016 was weak, at around 2.4%, and forecasts point to growth of 4% for 2017 and 2018, well below the average 7% growth since 1980 (OECD, CAF and ECLAC, 2018).

Like the rest of the Latin American and Caribbean countries, the countries of the Mesoamerican Integration and Development Project, except for Mexico and Nicaragua, have not been able to recover the growth rates recorded in the pre-crisis period 2003-2008 (see figure I.1). In the medium- and long-term, the subregion faces the challenge of boosting economic activity in an international context less favourable than that which characterized much of the past decade.

In addition, the so-called fourth industrial revolution is expected to transform the world of work, production and consumption, and the global economy. The process of automation is already under way and is intensifying and could lead to large transfers of employment between sectors, changes in the demand for skills, and the destruction and creation of many jobs. The results are uncertain and there is growing concern about the effects of new technologies and their distributive repercussions, with great uncertainty about who wins and who loses from these transformations (OECD, CAF and ECLAC, 2018). They also highlight the need to deepen efforts in human resource education and specialization, to diversify and sophisticate production structures, and to improve the coverage and quality of telecommunications services so that populations and companies can make productive use of these changes.

Figure I.1
Mesoamerica: average growth rate, 2003-2008 and 2009-2017, GDP at constant prices
(Percentages)
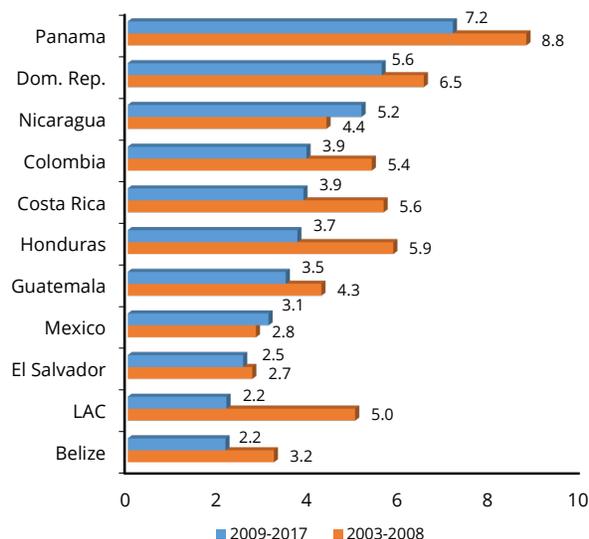
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html. Data for Honduras correspond to the Central Bank of Honduras.

Given the importance of the United States as a trading partner for the economies of the Mesoamerican region, its recovery will have a decisive impact on the performance of the subregion. In fact, all the Mesoamerican economies grew at a higher level than expected for Latin America and the Caribbean as a whole (1.3%), with significant variation in growth rates, ranging from 1.4% in Belize to 5.3% in Panama (see figure I.2).

Figure I.2
Mesoamerica: 2017 average growth rate, GDP at constant prices
(Percentages)
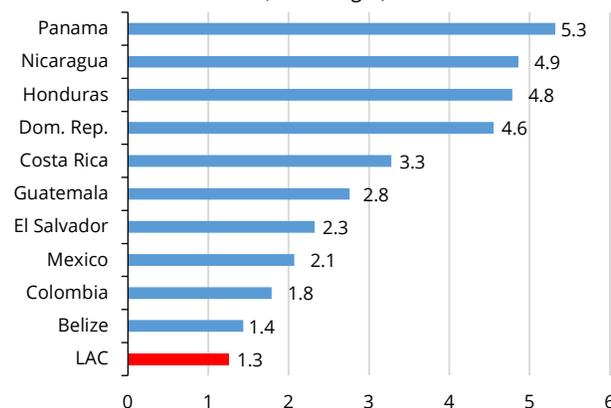
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [database on-line] http://estadisticas.cepal.org/cepalstat/Portada.html.

The Latin American and Caribbean countries face a complex global economic scenario in the coming years, which is expected to reduce the growth dynamics of both developed and emerging economies, accompanied by increased volatility in international financial markets.

Added to this is the structural weakening of international trade, aggravated by trade tensions between the United States and China (ECLAC, 2019a). This complex macroeconomic environment highlights the need for the Mesoamerican region to make progress in reactivating domestic demand and investment in the search for increases in productivity and competitiveness. To this end, it is necessary to create quality jobs, increase private investment, simplify processes and strengthen institutions in order to provide stable, secure and transparent environments for doing business. In this

process, the commitment to strengthen intraregional markets appears as a pragmatic strategy to advance in the diversification of the productive structure and the

export basket, as well as to increase resilience to external shocks.

B. Gross domestic product in the region

As indicated, the size of the Mesoamerican economies shows great heterogeneity; thus, Mexico's per capita GDP growth is almost double that of the second largest economy in the bloc (Colombia) and is located at a significant distance from the SICA countries.

Only Mexico exceeds the average level of per capita GDP growth in Latin America and the Caribbean. In 2005-2017, the evolution of this variable in the Mesoamerican region shows results below the regional average.

C. Costumer Price Index

A shared characteristic among the countries of the subregion is the adherence to prudent fiscal and monetary policy criteria, with a clear commitment to nominal macroeconomic stability. As a result, the countries of the region have low levels of inflation. Over the past nine years, the annual change in the consumer price index has remained in single digits. In 2017, there was a slight general upturn in inflation, but it remained below 10% (see figure I.3).

Inflation decelerated in the subregion during the first ten months of 2018 and was most pronounced in September and October. Once again, this has its origin in the evolution of the exchange rate and the price of crude oil, since the appreciation of currencies and the lower price of oil contributed to a reduction in the pace of price growth in the subregion (ECLAC, 2019a).

Figure I.3
Mesoamerica: 2009-2018 inflation rate in the MP countries
(Percentages)
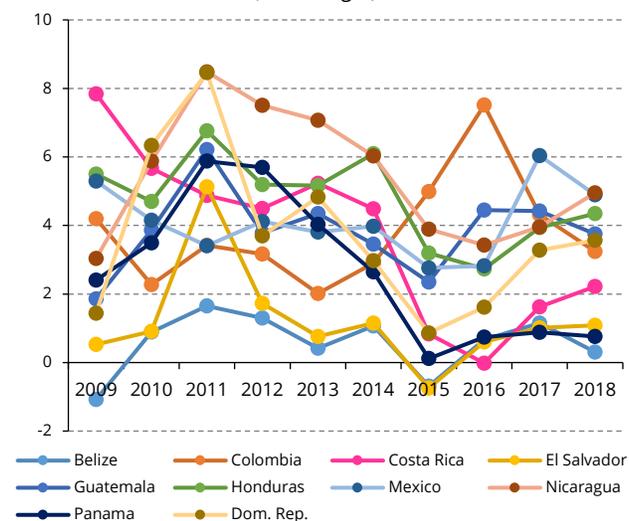
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.

D. Employment

In the post-crisis period, the countries of the subregion have shown progress in employment generation (see figures I.4 A and B). Stability of the unemployment rate at the regional level is reflected in the countries of the region: in most of them, changes in the unemployment rate are very small. Variations in participation and occupancy rates did not differ much in most countries.

Figure I.4
Mesoamerica: evolution of open unemployment rate, 2007-2018
(Percentages of total workforce)
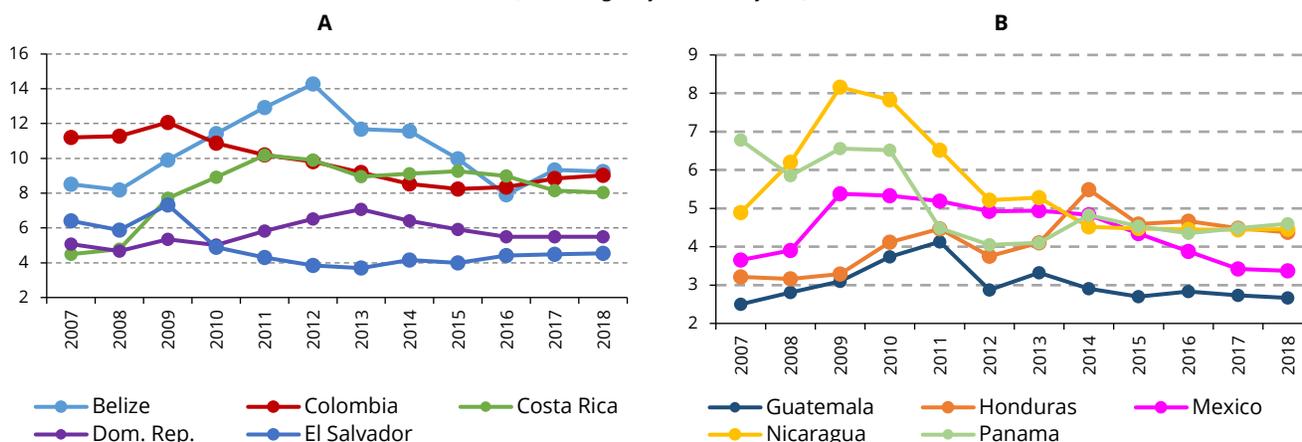
Source: ECLAC, based on World Bank, 2019.

As a result, the unemployment rate in these countries did not change dramatically either. The exceptions are, on one hand, Belize, Colombia and Costa Rica, where there was a relatively sharp increase in the unemployment rate, due to a fairly steep drop in the employment rate in the case of Colombia and marked increases in the participation rate in the case of the other two countries. In the region's two largest economies, Brazil and Mexico, the unemployment rate declined slightly as a result of an expansion of the employment rate greater than the participation rate (ECLAC, 2019a).

In Costa Rica and Mexico, registered employment increased at rates similar to the 2017 rate, while in El Salvador there was a moderate acceleration, although the rates are still not very dynamic. In Nicaragua, which experienced a strong expansion in the number of contributors to the Nicaraguan Social Security Institute for a prolonged period, the conflict triggered in 2018, precisely because of a proposal for social security reform, led to a marked contraction in the numbers of contributors. Costa Rica and Mexico show improvements in the total wage employment composition, given that the number of contributors

grows more than the wage employment as a whole. This situation may be since most of the new wage-earning jobs are generated in the formal sector or to informal employment formalization policies (ECLAC, 2019a).

E. Fiscal deficit and public debt

Public debt, as a percentage of GDP, is still at relatively moderate levels and below 50%, except for Belize (see figure I.5). Although the region has shown an improvement in the primary fiscal outcome, the macroeconomic environment could raise the cost of debt and push up interest payments and the level of public debt in 2019 (ECLAC, 2019a).

In Central America, the level of indebtedness fell by 0.1 percentage points of GDP and averaged 38.9% of GDP in 2018. Costa Rica had the largest increase in public debt, equivalent to 3.3 percentage points of GDP (ECLAC, 2019a).

In this scenario, Mesoamerican governments are faced with the dilemma of how to meet the growing needs of their population, without prominently increasing their debt or putting its sustainability at risk. In addition, growing international competition forces Mesoamerican economies to make costly investments in infrastructure. For this reason, supporting the creation of public goods of regional scope, such as those agreed upon in the framework of the MP, is presented as one of the most efficient solutions to address this complex challenge.

Figure I.5
**Mesoamerica: central government debt and fiscal deficit, 2017**
(Percentages of GDP)
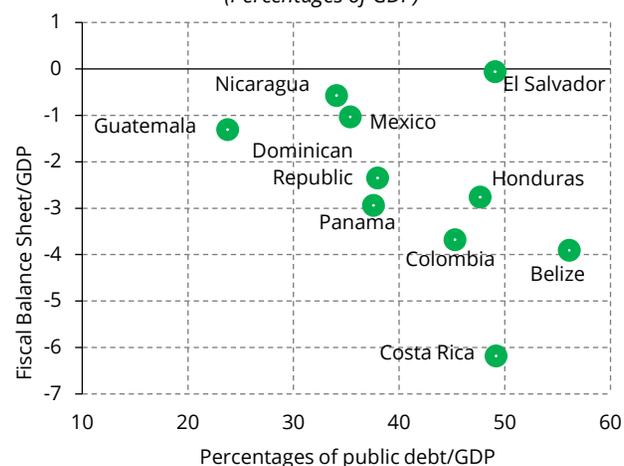
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.

F. Investment levels

The Mesoamerican region shows low levels of investment, measured by the gross formation of fixed capital, which is fundamental for growth. According to the United Nations Conference on Trade and Development (UNCTAD, 2003), the poorest countries require stable investment rates of about 20% of GDP in order to grow at the rates necessary to enable some convergence with developed countries. In developing and middle-income countries, like most Mesoamerican countries, the required amount is at least 25% as a proportion of GDP. In the Mesoamerican region, it is important to make efforts to raise investment levels in order to achieve sustained growth.

While all Mesoamerican countries experienced a fall in investment in the crisis period that began in 2008, even before the crisis their levels were lower than those of higher-growth countries such as China, Indonesia and the Republic of Korea (see figure I.6). An integrated region, with clear investment plans at the national and regional levels, broadens the investment incentives that are so necessary for the growth of the member countries of the MP.

Figure I.6
Mesoamerica and selected Asian countries: gross fixed capital formation, 2000-2017
(Percentages of GDP)
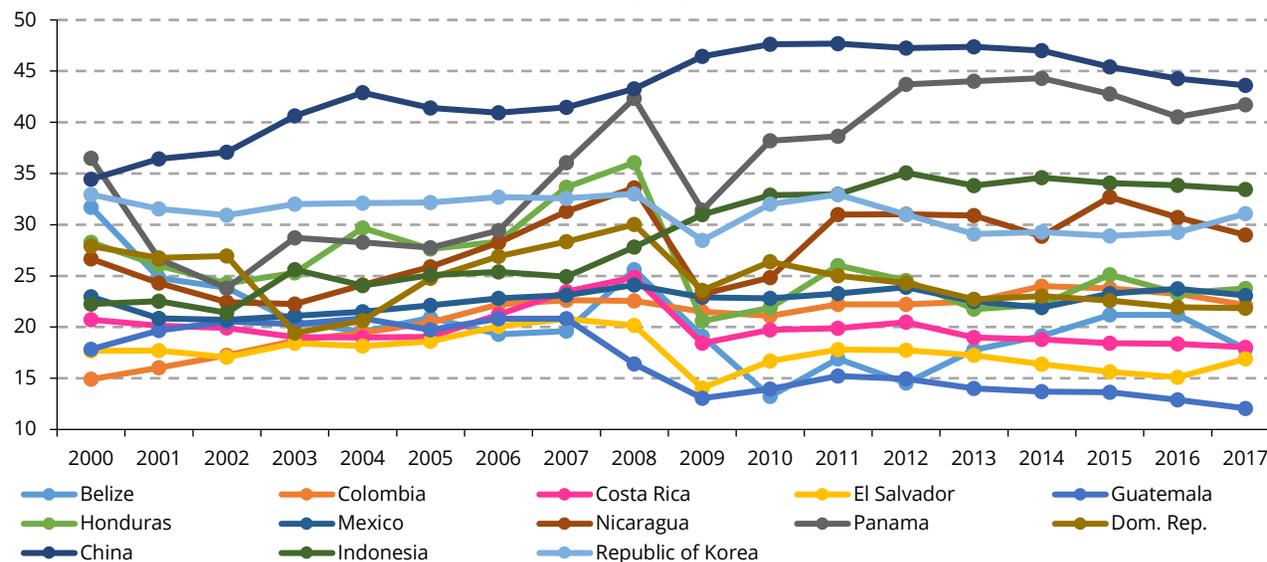
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on World Bank, 2019.

II. Trade and investment

A. Regional and world integration

The Mesoamerican region is characterized by open economies that are deeply integrated into the international trading system. These countries have maintained an open trade policy with the intention of expanding markets for their economies and thus interacting under preferential conditions with their main export and import partners.

As a result of this policy, table II.1 exemplifies the main free trade agreements available to the countries of the subregion, which are part of a wide range of bilateral and multilateral trade agreements.

Table II.1
Mesoamerica: participation in free trade agreements, 2018[a]

Bilateral agreements			Multilateral agreements	
Country	**Partner**		**Agreement**	**Member**
Colombia	Canada Chile Republic of Korea Costa Rica	Cuba United States Mexico Panama (S)	Pacific Alliance	Colombia Mexico
Costa Rica	Canada (IM) China Colombia	Peru Singapore	European Free Trade Association	Colombia Costa Rica Guatemala (F) Mexico Panama
Guatemala	Peru (S) Taiwan Province of China		CARICOM – Costa Rica[b] – Colombia	Belize Dominican Republic
Honduras	Canada Peru		CARIFORUM - European Community	Belize Dominican Republic
Mexico	Bolivia Chile Colombia Israel	Japan Panama Peru Uruguay	Central America – Chile – Mexico – Panama – Dominican Republic	Costa Rica El Salvador Guatemala Honduras Nicaragua
Nicaragua	Cuba Taiwan Province of China		Central America – Republic of Korea (S)	Costa Rica El Salvador Guatemala Honduras Nicaragua Panama

Bilateral agreements			Multilateral agreements	
Country	Partner		Agreement	Member
Panama	Canada Chile Colombia (S) Cuba United States Mexico	Peru Dominican Republic Singapore Taiwan Province of China Trinidad and Tobago	Central America – European Union	Costa Rica El Salvador Honduras Nicaragua Panama
Dominican Republic	Panama		Central America – United States – Dominican Republic	Costa Rica El Salvador Guatemala Honduras Nicaragua Dominican Rep.
			T-MEC CPTPP	Mexico
			North Triangle – Colombia	El Salvador Guatemala Honduras
			European Union	Colombia Mexico
			El Salvador – Honduras – Taiwan Province of China	

Source: Economic Commission for Latin America and the Caribbean (ECLAC) based on information from the Foreign Trade Information System (SICE) of the Organization of American States (OAS) and official information notes.
Note: I.M.= In modernization; S = Signing.
[a] To June 2018.
[b] Treaty currently in force with Belize, Guyana, Jamaica and Trinidad and Tobago.

Central America also has a consolidated integration mechanism that makes it an active common market, with great commercial dynamism and a regional network of organizations. This common market has deepened its relations with Colombia, Mexico and the Dominican Republic through various trade agreements. Belize does not have free trade agreements, as it has preferential access to US markets through the Caribbean Basin Initiative, and to the European Union through the CARIFORUM-EU Economic Partnership Agreement. As a member of the Caribbean Community (CARICOM), Belize participates in the agreements that this bloc has with MP countries such as Colombia, Costa Rica and the Dominican Republic. At bilateral level, Belize has a Partial Scope Agreement with Guatemala.

In addition, the Mesoamerican subregion has an extensive trade and economic cooperation agreement network. This wide range of agreements means that the progressive reduction of discriminatory measures for regional trade (both tariff and non-tariff) places the levels of trade openness of the MP countries above the average in Latin America and the Caribbean (see figure II.1).

The level of trade openness tends to be lower if the economy is larger. In this sense, the level of openness shown in figure II.1 does not measure the international weight or the level of openness of a country's trade policy, but rather the importance of exports and imports in relation to the country's total GDP.

Although the MP countries have not signed their own trade agreement to carry out their exchanges, important steps have been taken in terms of convergence of free trade agreements (FTAs) between Central America and Mexico. Thus, the technical negotiations for the convergence of the Single FTA between Central America and Mexico, which was signed on November 22, 2011, were concluded on October 20, 2011. Colombia has signed agreements with the countries of northern Central America and with Panama. Likewise, there are great efforts such as the Customs Union between Guatemala and Honduras, which effects could be expanded given the potential entry of El Salvador. However, there is still plenty of room to deepen trade agreements in the Mesoamerican sub-region. There are areas such as services where there is still much room to consolidate relations among Mesoamerican countries.

Figure II.1
Mesoamerica: trade openness level in current prices, 2017
(Percentages of GDP)
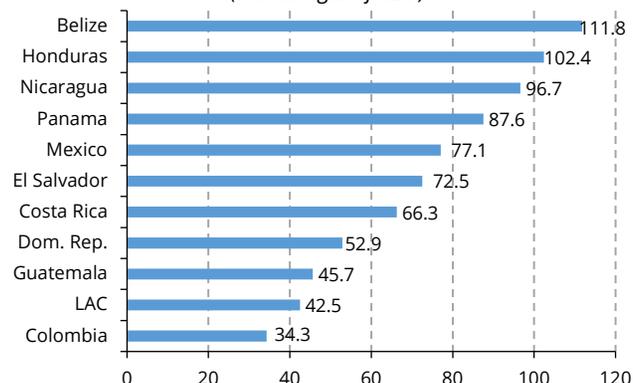
Country	Value
Belize	111.8
Honduras	102.4
Nicaragua	96.7
Panama	87.6
Mexico	77.1
El Salvador	72.5
Costa Rica	66.3
Dom. Rep.	52.9
Guatemala	45.7
LAC	42.5
Colombia	34.3

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.
Note: trade openness level understood as the ratio of the sum of imports and exports of goods and services to GDP.

B. Intraregional trade

Intraregional trade in Mesoamerica has expanded, reaching 32 billion dollars in 2017 (see figure II.2). Colombia, Costa Rica, Mexico and Panama have positive trade balances with the subregion (see figure II.3), a situation that has improved considerably since 2012, when only Mexico had a positive balance. However, the persistence of trade deficits within the subregion underscores the importance of the supply of final goods and inputs and indicates the need to create and consolidate Mesoamerican value chains.

The MP's intraregional trade dynamics show behaviours corresponding to the structural characteristics of its members (see table II.1). Smaller countries with a well-established integration framework belonging to SICA experience higher levels of trade between them. Mexico, on the other hand, has an export structure oriented towards the United States, while the Mesoamerican partners represent a minority portion of Mexican exports. Belize, Colombia and the Dominican Republic also

have an export structure more linked to non-member countries than to Mesoamerican partners.

In the case of Belize and Dominican Republic, in addition to the fact that their primary import and export destinations are the United States, the relationship with the members of the CARICOM bloc stands out. Colombia, on its part, is an important exporter of hydrocarbons whose sales are concentrated in the United States, although in recent years it has intensified its relationship with China, which increasingly occupies a more relevant role in the region.

Figure II.2
Mesoamerica: total exports, 2008 and 2017
(Millions of dollars)

Source: United Nations, based on UN Comtrade [online database] https://comtrade.un.org/.
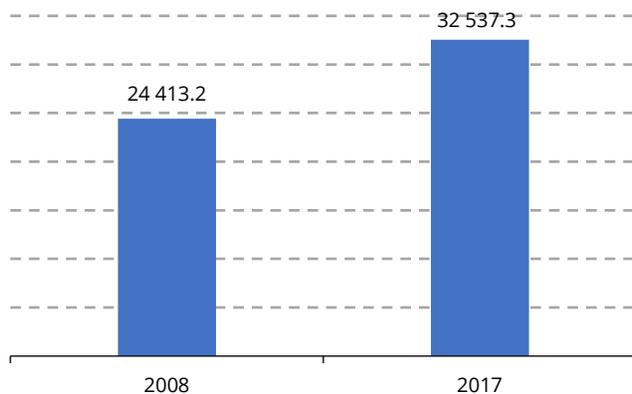
Figure II.3
Mesoamerica: intraregional trade balance, 2017
(Millions of dollars)

Source: United Nations, based on UN Comtrade [online database] https://comtrade.un.org/.
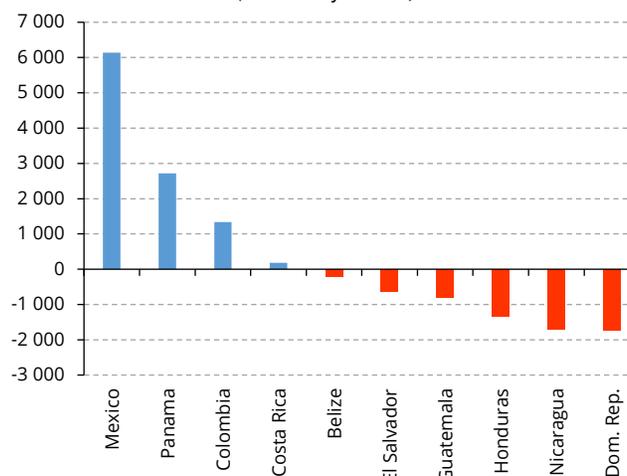
Table II.1
Mesoamerica: intraregional trade as a percentage of total trade, 2017

Country	Export	Import
Belize	7.9%	26.6%
Colombia	14.3%	8.8%
Costa Rica	25.9%	16.8%
Dominican Republic	2.7%	10.1%
El Salvador	56.5%	35.8%
Guatemala	37.6%	27.5%
Honduras	19.8%	26.9%
Mexico	2.4%	0.9%
Nicaragua	22.4%	36.4%
Panama	48.7%	11.2%

Source: United Nations, based on UN Comtrade [online Database] https://comtrade.un.org/.

As mentioned before, the members of the MP maintain a strong trade relationship with the United States which is reflected both in the volume of trade and in the sources of foreign direct investment (FDI) (see table II.2).

Table II.2
Mesoamerica: United States share of total exports and imports, 2017

Country	Export	Import
Belize	26.3%	35.6%
Colombia	29.1%	26.3%
Costa Rica	40.9%	36.4%
Dominican Republic	53.3%	44.4%
El Salvador	44.9%	31.8%
Guatemala	34.4%	39.9%
Honduras	40.2%	34.7%
Mexico	79.9%	46.4%
Nicaragua	58.6%	23.5%
Panama	20.2%	18.5%

Source: United Nations, based on UN Comtrade [online Database] https://comtrade.un.org/.

However, the concentration of commercial relations in a few partners generates vulnerability to possible external shocks. Therefore, geographic and sectoral diversification of their trade relations is a requirement to improve the international insertion of the MP countries, in addition to the fact that productive diversification is also a form of resilience. In this sense, together with the efforts that the members of the group are making to improve their position on the Asian continent, the intraregional market growth is also seen as a strategic option to consolidate commercial relations diversification.

There are several reasons to bet on the strengthening of the Mesoamerican regional market as an alternative to increase productivity and competitiveness of the countries as a whole. A sophistication and productive integration strategy would add value, improve health quality and promote innovation, both in new sectors and through modernization of traditional sectors. On one hand, the smaller economies of the bloc may find in the regional dimension the size and scales that their internal markets do not offer. On the other hand, the larger countries would benefit from the attraction of diversification of both partners and exported products. Finally, geographical proximity facilitates the formation of regional production chains that would allow to capture and add value and promote innovation at intraregional level.

C. Technological content of trade

An analysis of the technological content of intraregional exports reveals that the technological complexity of the exports of the Mesoamerican countries tends to be greater in the exports of the Mesoamerican intraregional market. Nevertheless, the technological level varies according to the countries' export structure.

Both Colombia and the members of the Central American Common Market (CACM) are a clear example of how exports made in the intraregional context have a greater technological component than extra regional exports. Although Colombia's export offer consists of almost 70% of raw materials (see figure II.4), exports to Central America have a slightly higher technological content than the rest of the world: the sum of low, medium and high technology manufactures represent 20% of bilateral trade.

Figure II.4
Colombia: technological intensity of exports to CACM (A) and to the world (B), 2017
(Percentages)
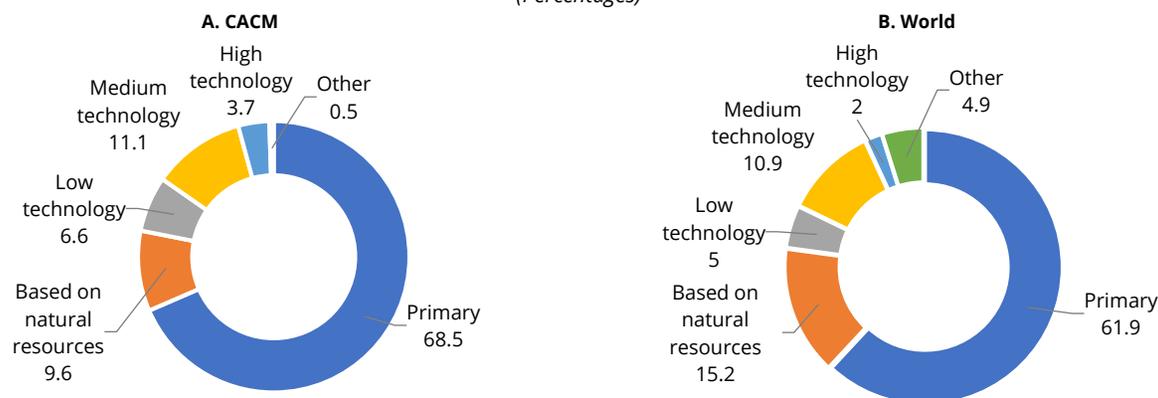
A. CACM

High technology 3.7
Medium technology 11.1
Other 0.5
Low technology 6.6
Based on natural resources 9.6
Primary 68.5

B. World

High technology 2
Medium technology 10.9
Other 4.9
Low technology 5
Based on natural resources 15.2
Primary 61.9

Source: Economic Commission for Latin America and the Caribbean (ECLAC); International Trade Information System (SIGCI Plus) [online] https://sgo-win12-we-e1.cepal.org/dcii/sigci/sigci.html.

In CACM countries it is more significant, while their world exports represent 22% of primary exports, the percentage drops to 9% when exports go to CACM (see figure II.5). Likewise, the content of low, medium and high technology exports represents 55% of international market exports, while in the intraregional market this amount reaches 64%. In addition, natural-resource-based manufactures (26%) have a greater importance than international exports (21%).

Figure II.5
CACM: technological intensity of exports to CACM (A) and to the world (B), 2017
(Percentages)
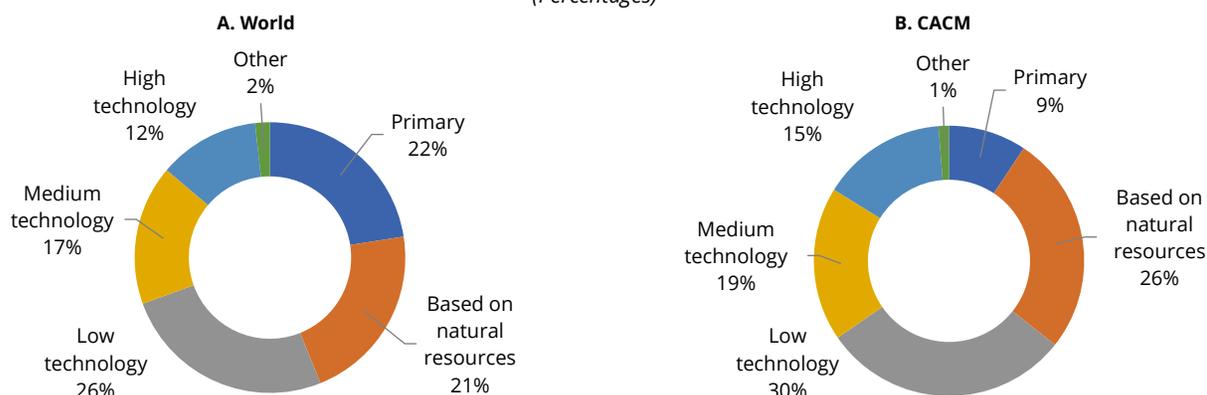
A. World

Other 2%
High technology 12%
Primary 22%
Medium technology 17%
Based on natural resources 21%
Low technology 26%

B. CACM

Other 1%
Primary 9%
High technology 15%
Based on natural resources 26%
Medium technology 19%
Low technology 30%

Source: Economic Commission for Latin America and the Caribbean (ECLAC); International Trade Information System (SIGCI Plus) [online] https://sgo-win12-we-e1.cepal.org/dcii/sigci/sigci.html.

In Mexico, as a result of its manufacturing base with a clear export vocation to the U.S. market, it is possible to indicate that the level of primary exports goes from 11% in international exports to 6% in exports made to the partners of the MP that are part of the CACM. On the other hand, natural-resource-based manufactures account for 8% of world exports compared with 20% of exports to the CACM, and low-technology manufactures account for 20% of exports to the CACM compared with 9% of the total exports to the world (see figure II.6).

Given this "detachment" effect of intra Mesoamerican trade, the strengthening of the regional internal market can act as a catalyst to facilitate the conversion of the Mesoamerican productive base towards sectors with higher added value and productivity. Organizations such as the Central American Economic Integration Secretariat (SIECA) corroborate the potential for geographical and sectoral diversification of intraregional markets. Neighbouring countries to Central America such as Colombia, Mexico or the Dominican Republic, among others, present opportunities for geographic and sectoral diversification that can be maximized through the elimination of obstacles that impede greater exchange between the Central American subregion and these Latin American neighbours (SIECA, 2014).

Figure II.6
Mexico: technological intensity of exports to CACM (A) and to the world (B), 2017
(Percentages)
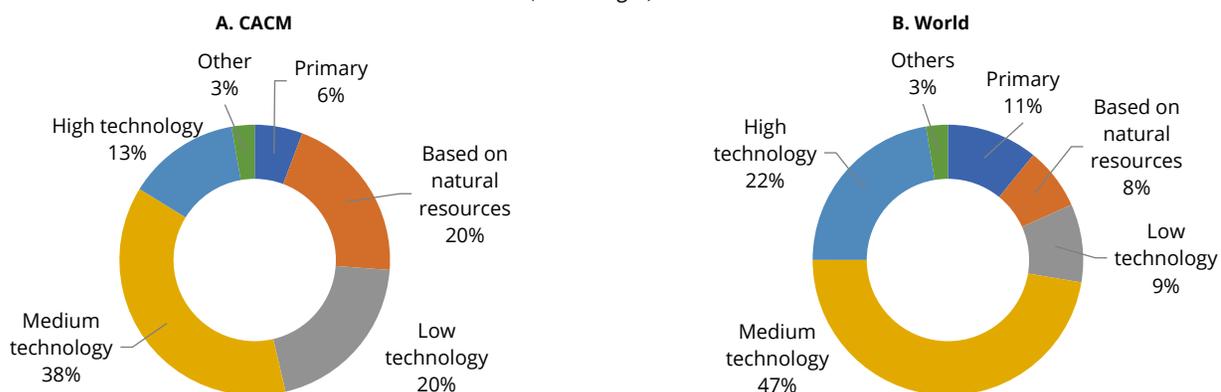
A. CACM

Other 3%
Primary 6%
High technology 13%
Based on natural resources 20%
Medium technology 38%
Low technology 20%

B. World

Others 3%
Primary 11%
High technology 22%
Based on natural resources 8%
Medium technology 47%
Low technology 9%

Source: Economic Commission for Latin America and the Caribbean (ECLAC); International Trade Information System (SIGCI Plus) [online] https://sgo-win12-we-e1.cepal.org/dcii/sigci/sigci.html.

D. Direct foreign investment

Foreign investment in the subregion responds to business strategies to expand markets, in some cases to the search for efficiency (low costs, including both wage costs and others related to production and taxes) and to the search for strategic assets. Any of these strategies emphasizes investor confidence in the growth of the subregion and security among countries and among private economic actors.

The subregion has proved to be an attractive destination for foreign direct investment (FDI). Flows to Mesoamerica have been growing despite the fluctuations that affect the region from time to time (see figure II.7).

Figure II.7
Mesoamerica: FDI inflows, 2000-2017
(Millions of dollars)
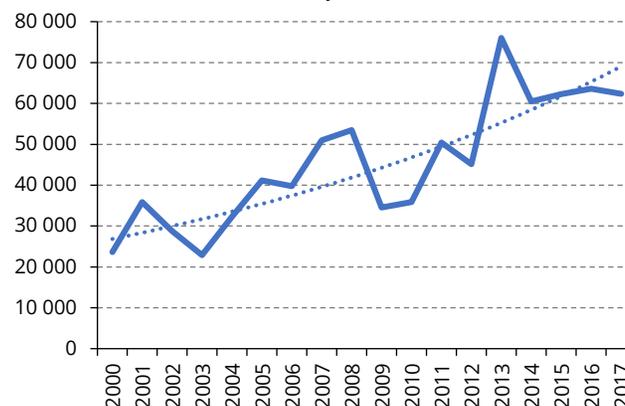
Source: Economic Commission for Latin America and the Caribbean (ECLAC), Foreign Direct Investment in Latin America and the Caribbean, (LC/PUB.2018/13-P), Santiago, Chile, 2018 and national sources.

There is a positive correlation between the stock of FDI in a country or region and its insertion in global and regional value chains, which shows an increasing contribution of Mesoamerica to global production. The subregion's insertion into global and regional value chains is done through strong connections with U.S. companies, but also through the growing participation of global regional companies.

Table II.3
Mesoamerica: intraregional FDI inflows as a percentage of the total, 2000-2002, 2005-2007, 2010-2012 y 2015-2017

Country	2000-2002[a]	2005-2007[b]	2010-2012	2015-2017
Belize	n.d.	n.d.	n.d.	n.d.
Colombia	5%	12%	23%	18%
Costa Rica	19%	9%	16%	12%
Dom. Rep.	3%	1%	8%	1%
El Salvador	12%	53%	107%	62%
Guatemala	n.d.	13%	20%	37%
Honduras	12%	18%	29%	37%
Mexico	0.1%	0.2%	1.1%	0.5%
Nicaragua	13%	33%	24%	n.d.
Panama	32%	5%	19%	19%
Total	1.7	4.6%	11.4%	8.4%

Source: Economic Commission for Latin America and the Caribbean (ECLAC), Foreign Direct Investment in Latin America and the Caribbean, (LC/PUB.2018/13-P), Santiago, Chile, 2018 and national sources.
[a] In the cases of El Salvador and Nicaragua, refers to the period 2001-2002.
[b] In the case of Guatemala, refers only to 2007.

Mexico and Colombia, both in terms of size and economic structure, are the largest recipients of FDI in the Mesoamerican region; they both account for 81% of the total FDI reaching the subregion. In smaller countries, the role of intraregional FDI stands out. In the 2015-2017 period, the case of El Salvador stands out, since 62% of its FDI originated in Mesoamerican

countries. Guatemala (37%) and Honduras (37%) also highlight the importance of intraregional FDI in their total FDI. These three cases demonstrate the growing importance of intraregional FDI flows (see table II.3).

Intraregional investment has increased by four times over the past ten years (see figure II.8), which shows greater dynamism than the global FDI received in Mesoamerica. This dynamism suggests the growth of the domestic market and the strengthening of trust between countries and firms and the creation of regional production chains.

Figure II.8
Mesoamérica: intraregional FDI, 2000-2017
(Millions of dollars and in percentages with respect to total FDI received)
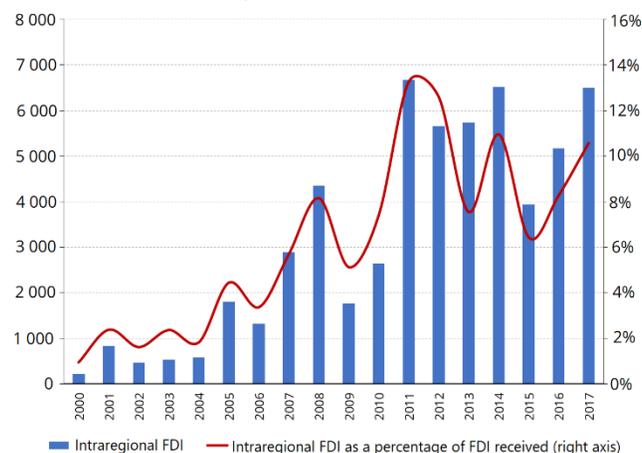
Intraregional FDI · Intraregional FDI as a percentage of FDI received (right axis)

Source: Economic Commission for Latin America and the Caribbean (ECLAC), Foreign Direct Investment in Latin America and the Caribbean, (LC/PUB.2018/13-P), Santiago, Chile, 2018 and national sources.

III. Competitiveness, SMEs and information technologies

Several elements influence a country's competitiveness to facilitate socio-economic development. Competitiveness is commonly divided into two main groups: static competitiveness, related to factors such as natural resource endowment, low labour costs or geographical position, among others, and dynamic competitiveness, which is constructed and changes over time in areas such as research, development and innovation, human capital formation or investment in economic infrastructure, among others. Two frequently used tools for measuring competitiveness are the World Bank's Doing Business report and the World Economic Forum's Global Competitiveness Index.

Doing Business (World Bank, 2019) emphasizes the ease granted by the regulatory framework to conduct business. Countries are evaluated in ten areas considered critical in the promotion of business activity, data are provided to analyse and compare the regulatory cost of each economy, and the times and processes of improvement in terms of regulation are analysed.

In 2019 the economy that ranked number one was New Zealand, while the first economy of the MP countries was Mexico (see figure III.1) when it reached 54th out of a 190-country classification. The rest of the MP countries are positioned as follows: Colombia (65), Costa Rica (67), Panama (79), El Salvador (85), Guatemala (98), the Dominican Republic (102), Honduras (121), Belize (125) and Nicaragua (132).

Figure III.1
Mesoamerica: classification in the *Doing Business* report, 2015-2019
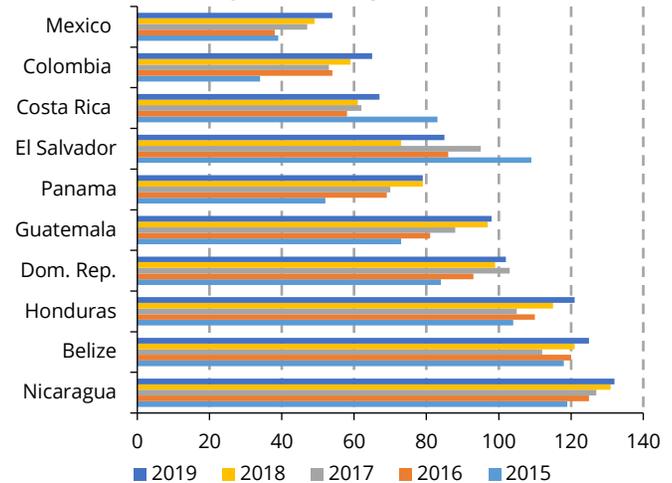
Source: World Bank, *Doing Business 2019: Capacitación para reformar*, Washington, D.C, 2019.

No Mesoamerican economy increased its position in the 2018-2019 period, partly because LAC was the second least reformed region in the 2017-2018 period. However, Panama remained stable at 79th place and improved business conditions were observed in El Salvador, Costa Rica and the Dominican Republic between 2017 and 2018.

In fact, in 2018 El Salvador was one of the ten economies that showed a notable improvement in the performance of their indicators and in the Dominican Republic, important changes were introduced to improve the reliability of the electric

system. Guatemala, Nicaragua and Panama experienced an annual decrease in their rating between 2015 and 2018, a similar situation occurs in Mexico between 2016 and 2019, and in Colombia between 2017 and 2019.

Comparing the countries of the MP with those of the Latin America and the Caribbean region (see figure III.2), the Mesoamerican region has three out of the five most favourable environments for doing business. Furthermore, Mexico, Colombia, Costa Rica, Panama and El Salvador are among the top ten in Latin America and the Caribbean.

Mesoamerica is 415.2 dollars which, although lower than the average for Latin America and the Caribbean (529.8 dollars), is higher than regions such as East Asia and the Pacific (382.2 dollars) or the countries of the Organization for Economic Co-operation and Development (OECD) (139.1 dollars).

The same difference applies to import costs, where the average for Mesoamerica is 458.8 dollars, below the Latin American and Caribbean average (647.2 dollars), although it exceeds costs in the East Asia and the Pacific region (415.8 dollars) and the OECD (100.2 dollars) (see figure III.3).

Figure III.2
Mesoamerica: ranking among 32 economies of Latin America and the Caribbean in the *"Doing Business"* report, 2019

Source: World Bank, *Doing Business* 2019: Reform Capacitation, Washington, D.C, 2019.

Figure III.3
Mesoamerica, Latin America, East Asia and the Pacific and OECD: import and export cost in dollars, 2019
(Dollars)
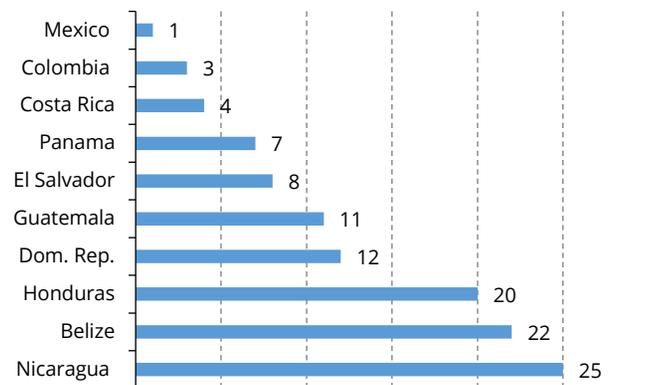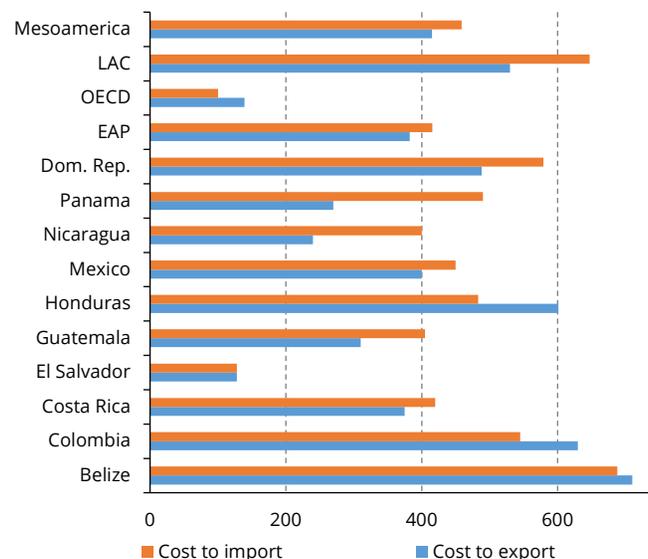
Source: World Bank, *Doing Business* 2019: Reform Capacitation, Washington, D.C, 2019.

Among the areas offering the greatest opportunity for cooperation at the Mesoamerican level is the facilitation of cross-border trade. Currently, the average cost of border compliance for export to

Figure III.4
Mesoamerica: border compliance, in days,
for export and import, 2019
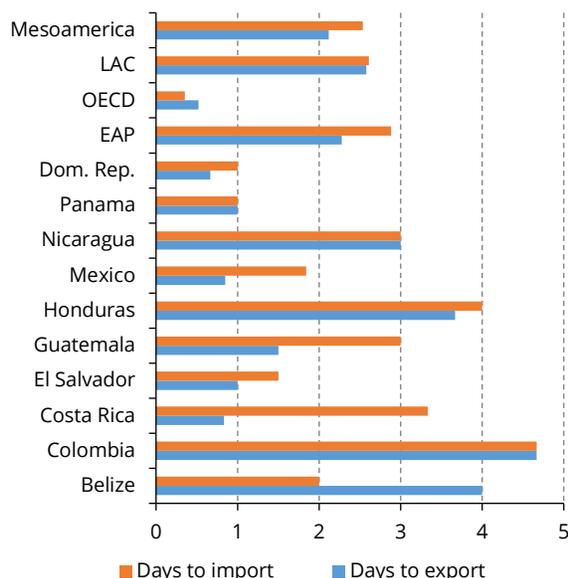
Source: World Bank, *Doing Business* 2019: Reform Capacitation, Washington, D.C, 2019.

The main problems in terms of trade facilitation in Mesoamerica and the high comparative costs with respect to other regions can be explained by the lack of efficiency in the logistics infrastructure and by the bottlenecks inherent in customs management (see table III.1). Formally, Mesoamerica's regulatory frameworks are comparable to those of other more advanced regions. However, their operability presents inefficiencies that would be corrected more effectively if they were addressed through policies that promoted greater regional cooperation.

Other competitiveness analyses different from the World Bank's *Doing Business* broaden its focus and include a transversal set of areas such as education, health, regulatory stability, institutional strength and quality, susceptible to be faced from different public policies, beyond those designed by the ministries of commerce, economy and industry.

An example of this systemic view of competitiveness is the World Economic Forum's Global Competitiveness Index (GCI). The GCI ranks 140 economies and builds on 12 competitiveness pillars (World Economic Forum, 2018):

a) Enabling environment: (i) institutions, (ii) infrastructure, (iii) ICT adoption, and (iv) macroeconomic stability.

b) Human capital: (v) health and (vi) skills.

c) Markets: (vii) product market, (viii) labour market, (ix) financial system, and (x) market size.

d) Innovation ecosystem: (xi) entrepreneurial dynamism and (xii) innovative capacity.

Table III.1
Mesoamerica: ranking by activity according to *Doing Business*, 2019

Assessed Areas	Classification									
	BE	CR	CR	ES	GU	HO	MX	NI	PA	DR
Starting a business	162	100	142	147	89	154	94	144	48	117
Dealing with a construction permit	119	89	74	173	122	116	93	177	108	80
Getting electricity	91	80	38	97	44	153	99	110	30	116
Registering property	135	59	47	73	86	95	103	155	81	77
Getting credit	172	3	12	22	22	12	8	99	22	112
Protecting minority investors	132	15	122	161	174	140	72	168	99	83
Paying taxes	52	146	57	62	102	164	116	160	174	148
Trading across borders	111	133	73	44	83	123	66	85	57	63
Enforcing contracts	133	177	121	109	176	152	43	87	147	149
Resolving insolvency	87	40	134	89	156	143	32	106	113	124

Source: World Bank, *Doing Business* 2019: Reform Capacitation, Washington, D.C, 2019.

Figure III.5
Mesoamerica[a]: ranking and score in the global competitiveness report, 2018

A more detailed analysis of the components of the index shows that the MP countries exhibit three common spaces for improvement: institutional system, security, and ICT adoption and innovation. The actions being undertaken at national level by the countries of the subregion through national instruments and plans for science and technology stand out. Nevertheless, at the moment there are no actions at regional level that make it possible to maximize their investments in science and technology.

Source: World Economic Forum, "The Global Competitiveness Report 2018", 2018 [online] http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobal CompetitivenessReport2018.pdf.
[a] Belize is not part of the economies assessed by the GCR.

Table III.2
Mesoamerica: position in the classification of total competitiveness and by pillar of competitiveness, 2018

Country and position in the GCR	Institutions	Infrastructure	ICT Adoption	Macroeconomic stability	Health	Skills	Product market	Labour market	Financial system	Market Size	Business dynamism	Innovative capacity
Mexico 46	105	49	76	35	56	86	54	100	61	11	41	50
Costa Rica 55	44	78	55	85	13	44	46	64	68	86	80	55
Colombia 60	89	83	84	56	35	80	85	80	53	37	49	73
Panama 64	83	66	81	50	33	85	52	87	41	79	71	66
Dominican Republic 82	99	77	82	77	63	90	84	51	70	69	90	94
Guatemala 96	123	96	112	75	89	101	40	110	74	74	91	100
El Salvador 98	131	90	103	69	60	107	87	104	64	95	111	123
Honduras 101	117	98	115	78	85	108	59	88	67	98	100	92
Nicaragua 104	122	104	111	79	36	113	89	103	90	107	122	121

Source: World Economic Forum, "The Global Competitiveness Report 2018", 2018 [online]
http://www3.weforum.org/docs/GCR2018/05FullReport/TheGlobalCompetitivenessReport2018.pdf

A. Small and medium-sized enterprises (SMEs) as competitiveness agents

Inclusive economic development requires a structural change that reallocates resources in an economy towards activities or sectors of higher added value and intensity of knowledge and technology. SMEs are the main actor for structural change due to their varied sectoral composition and their wide territorial and social distribution. Small and medium-sized enterprises are fundamental contributors to the promotion of inclusive economic growth in Latin America and the Caribbean, representing up to 99% of the region's enterprises and generating around 61% of formal jobs (Dini and Stumpo, 2018).

However, this importance, in quantitative terms does not translate into a similar contribution to regional GDP, since it is estimated that large companies generate up to 75% of the region's GDP, which reveals the big productivity gap between large companies and SMEs in Latin America and the Caribbean. It is estimated that large Latin American enterprises are 33 times more productive than microenterprises and six times more productive than small ones.

Data obtained from some Latin American countries emphasize that, although the productivity gap between SMEs and large companies exists both in Latin America and in Europe, in the case of Latin America the gap is greater, leaving a great deal of room for action for the implementation of public policies that strengthen the sustainability and productivity of SMEs (see figure III.6).

Figure III.6
Latin America and European Union (eight countries): internal relative productivity
(Percentages)
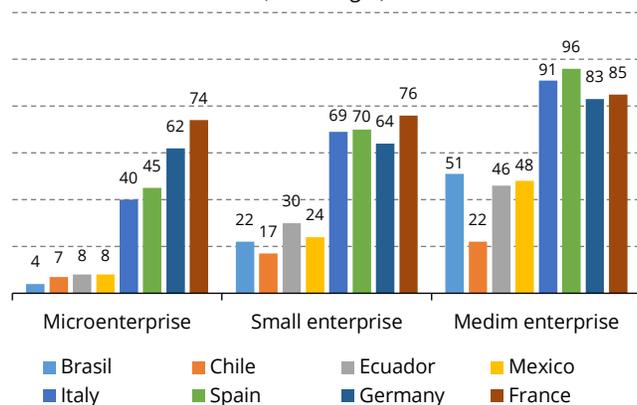
Source: M. Dini and G. Stumpo (coords.), "MSMEs in Latin America: a fragile performance and new challenges for promotion policies", Project documents (LC/TS.2018/75), Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 2018.
Note: The respective years are: Brazil, Chile and Ecuador, 2016; Mexico, 2013; Italy, Spain, Germany and France, 2015.

Given the important role of SMEs in job creation and in the total number of enterprises, improvements in their productivity are crucial for enhancing the overall competitiveness of economies. These improvements require public policies to strengthen their capacities to incorporate more capital into their productive processes, especially technology and human capital. As well as facilitating their connection to larger companies that ensure sales and transfer high production standards, and to regional and global chains that promote specialization and add value through innovation and knowledge. The promotion of their competitiveness and innovative capacity have the potential of contributing to the creation of jobs and improving their quality, to the sophistication of economies, and to the solution of major challenges, such as energy transition, environmental sustainability and insertion into the digital revolution, among others. Therefore, investment in education and training, research and development, and technology are key elements.

Box III.1
Main potentialities of SMEs as agents of structural change

Increased productivity through the introduction of technological and organizational changes, assisting in the creation and dissemination of innovations and new market development.
Complementarity with the economies of scale of large companies. With advantages in flexibility, SMEs can achieve lower transaction costs as a result of close contact with customers and faster decision making. SMEs would be able to access diversified markets and global value chains, benefiting from technology transfers.

Promotion and creation of productive agglomerations or clusters, this interaction allows the companies involved to achieve higher levels of production, incorporate technologies more easily, accelerate learning processes and, in short, achieve a level of collective efficiency that would not be achievable by an individual firm

Strengthening social inclusion by increasing microenterprise incomes and reducing their vulnerability. Many Latin American microenterprises have been created as a survival strategy due to the lack of dynamism of labour-intensive activities. These segments of the population are often not poor but include vulnerable sectors. Some policies to support microenterprises are effective and efficient in providing tools to raise incomes and give them stability.

Source: Organisation for Economic Co-operation and Development (OECD) and Economic Commission for Latin America and the Caribbean (ECLAC), "Perspectivas Económicas de América Latina 2013: Políticas de PYMES para el cambio structural" (Economic Outlook for Latin America 2013: SME policies for structural change) 2012 [online] https://www.cepal.org/es/publicaciones/1463-perspectivas-economicas-america-latina-2013-politicas-pymes-cambio-estructural.

B. Challenges: better information and access to funding

In order to exploit the potential for structural change represented by SMEs, the region must overcome several challenges. The first is to understand and capture the high diversity of SMEs in the region. At regional level, various definitions are applied which, in some cases, combine sales, employees and the economic sector, hampering the design of supportive policies at both national and regional levels (see table III.3).

Table III.3
Mesoamerica: SME definition by country

Country	Definition	Microenterprise	Small Business	Medium Business
Colombia	Employees	Up to 10	From 11 to 50	From 51 to 200
	Assets (at current legal monthly minimum wages)	Up to 50	From 51 to 500	From 501 to 3 000
	Gross sales	...	...	...
Costa Rica	Employees	From 1 to 10	From 11 to 35	From 36 to 100
	Assets (in colones)	Up to 65	> 65,1 <227.6	>227.7 <650.3
	Gross sales (in colones)	Up to 104	>104.1 <364.2	>364 300 <1 040.5
El Salvador	Employees	From 1 to 10	From 11 to 50	De 51 a 100
	Assets	...	...	...
	Gross sales (in dollars)	Up to 100	Up to 1 000	Up to 7 000
Guatemala	Employees	From 1 to 10	From 11 to 25	From 26 to 60
	Assets (in quetzales)	Up to 50	From 51 to 500	From 501 to 2 000
	Gross sales (in quetzales)	Up to 60	From 61 to 300	From 301 to 3 000
Honduras	Employees	From 1 to 10	From 11 to 50	From 51 to 150
	Assets	...	...	...
	Gross sales	...	...	...

Country	Definition	Microenterprise	Small Business	Medium Business
Mexico	Employees	...	...	...
	All	Up to 10	...	...
	Trade		From 11 to 30	From 31 to 100
	Service		From 11 to 50	From 51 to 100
	Industry		From 11 to 50	From 51 to 250
	Assets	...	...	...
	Gross sales (in Mexican pesos)	Up to 4 000	From 4 001 to 100 000	From 100 001 to 250 000
Nicaragua	Employees	From 1 to 5	From 6 to 30	From 31 to 100
	Assets (in cordobas)	Up to 200	Up to 1 500	Up to 6 000
	Gross sales (in cordobas)	Up to 1 000	Up to 9 000	Up to 40 000
Panama	Employees	...	...	...
	Assets	...	...	...
	Gross sales (in balboas)	Up to 150	>151 <1 000	>1 001 <2 500
Dominican Republic	Employees	From 1 to 15	From 16 to 60	From 61 to 200
	Assets (in millions of republican pesos)	Up to 3 000	From 3 001 to 12 000	From 12 001 to 40 000
	Gross sales (in millions of republican pesos)	Up to 6 000	From 6 001 to 40 000	From 40 001 to 150 000

Source: Martha Cordero and Guillermo Zúñiga, Trade in goods and services in Central America: a new look (LC / MEX / L.1081), Mexico, Economic Commission for Latin America and the Caribbean (ECLAC), 2012; National Council for the Competitiveness of Micro, Small and Medium Enterprises, Ministry of Economy of Mexico 2006-2012; Law 905 of 2004, Colombia.

In addition, quantitative information on Latin American SMEs is limited and of poor quality, which makes it difficult to quantify aggregate agents and workers, as well as to carry out comparative studies. The lack of information and common criteria causes difficulties in diagnosing, designing and evaluating policies to support SMEs. It also makes it difficult to measure the impact of public policies and development interventions, limiting opportunities for improvement or optimization. On the other hand, a better knowledge of SMEs would make it possible to design targeted policies for building resilience to climate change and disasters.

For example, the European Union has a uniform criterion —companies with fewer than 250 employees and an annual turnover not exceeding EUR 50 million or an annual balance sheet total of less than EUR 43 million—. Furthermore, social reality in the region indicates that self-employment is a widespread option given the lack of dynamism in labour markets, which leads to a large pool of one-person or family-owned microenterprises that respond to realities different from those represented by SMEs.

Another key element that blocks SMEs' potential as agents of structural change is access to funding. In Latin America and the Caribbean, only 40% of small businesses report having a bank loan or line of credit, a figure that reaches nearly 70% in the case of large businesses. The limited and unequal access of the productive sector to funding is a mechanism that

reinforces inequalities and forces companies with credit restrictions to rely mainly on their own resources (ECLAC, 2014), informal sources such as family and friends or the so-called "extra-banking" market that is estimated to supply a quarter of these companies (Lecuona, 2014).

Business surveys conducted by the World Bank show that the Mesoamerican region has two significant funding characteristics. First, regardless of size, the percentage of firms that identify funding as an obstacle to their operations is lower than the Latin American and Caribbean average. Except for Belize, Costa Rica and Honduras (see figure III.7), the differences in these parameters are due to very different public policy approaches to financial inclusion and financial structure, among other factors

Figure III.7
Mesoamerica: companies that identify access to funding as a major constraint, 2010
(Percentages)
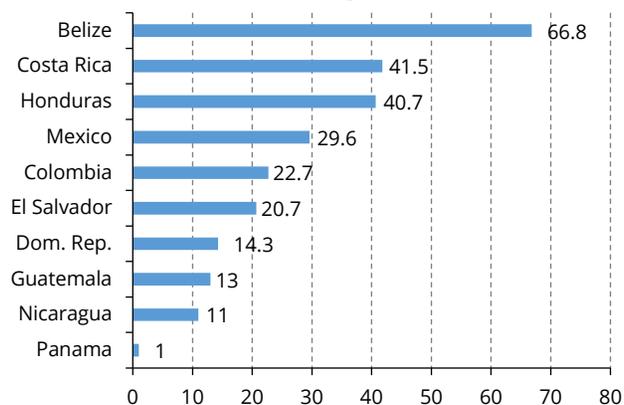
Source: World Bank, Enterprise Surveys, Washington, D.C., 2010.
Note: The corresponding years are Colombia and Guatemala, 2017; El Salvador, Honduras, Nicaragua and the Dominican Republic, 2016; and Belize, Costa Rica, Mexico and Panama, 2010.

Figure III.8
Mesoamerica: companies that identify access to funding as a serious constraint, 2010
(Percentages and size of enterprise)
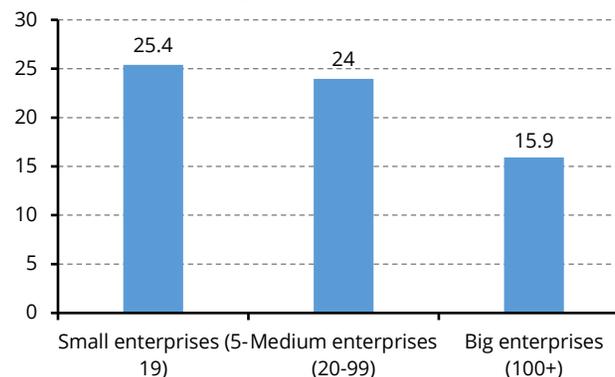
Source: Prepared by the author based on the World Bank, Enterprise Surveys, Washington, D.C., 2010.
Notes: Defined small businesses with 5 to 19 employees; the medium ones of 20 to 99 and the big ones of 100 or more.
The corresponding years are: Colombia and Guatemala, 2017; El Salvador, Honduras, Nicaragua and the Dominican Republic, 2016; and Belize, Costa Rica, Mexico and Panama, 2010.

The second characteristic of Mesoamerica is that difficulty of access to credit has an inverse correlation to the size of the company. The percentage of companies that encounter greater difficulties in access is greater as the size of the group asked is smaller. Therefore, the difficulty of access to funding is greater in small and medium-size countries than in large ones (see figure III.8). This is a repeated pattern in Latin America and the Caribbean.

The SME reality in Mesoamerica reflects the potential they must contribute to structural change and increase productivity in the region, offering spaces for public action at national or regional level. An ECLAC study for the cases of Colombia, Costa Rica and Mexico

(Lecuona, 2014) warns that among the main perceived limitations on granting institutional funding to SMEs are the following:

a) Availability and quality of financial statements.

b) High levels of informality and lack of credit history.

c) Lack of management skills professionalization and family ownership structures.

d) Regulation and legal environment: limits on interest rates and processes for the enforcement of guarantees.

Data for small, medium and large enterprises reflect the percentage of this type of enterprise that identifies lack of funding as a serious constraint.

Box III.2

Successful practices and challenges: the cases of Mexico, Costa Rica and Colombia

Leasing: When there is a systematic state program complemented by relevant legislative and public policy mechanisms, governments have the capacity to correct shortcomings in access to funding for SMEs. The Colombian administration's actions in the matter of guarantees and leasing instruments cause that country to present an extended and effective public guarantee funds scheme, which maintains a level of credit coverage to SMEs superior to that of Costa Rica and Mexico.

In a context where information on SMEs is deficient, state guarantees are critical for the SME credit system. Likewise, the use of leasing instruments, important to promote the investment capacity of SMEs, is more widespread in Colombia than in Costa Rica and Mexico, since Colombia has a public policy accompanied by a legislative and tax framework appropriate for the management and enforcement of guarantees.

Factoring: Development banking has the capacity to boost investment by SMEs. Mexico's experience in facilitating the introduction of factoring mechanisms demonstrates that the role of development banking has been vital to the creation of an electronic system in which SMEs that supply large companies and the government can obtain liquidity from their accounts receivable. This system, in addition to operating with very low costs, minimizes the risk because the debtors are of high credit quality. In addition, the system stimulates competition among financial intermediaries, which leads to an aggregated reduction in financial costs for SMEs.

Legal framework: the area of financial inclusion for SMEs, as in many other public policies aimed at fostering structural change, long-term vision, perseverance and consistency are vital to achieve the desired effects. The modest achievements made by the three countries in their programmes to set up venture capital funds show that structural aspects such as entrepreneurial culture and unfavourable legal frameworks can block the chances of success of public initiatives.

Information systems: Work on the SMEs specificity. In each of the three countries there are important advances in the constitution of information systems for the operation of the credit activity: credit bureaus, central guarantees or the project of a bureau of financial institutions in Mexico. However, there is no bureau yet with specific information on SMEs, so that providers, clients and financial intermediaries can make better informed decisions.

Source: Own elaboration based on Ramón Lecuona Valenzuela, Some lessons from the recent experience of SME funding: Colombia, Costa Rica and Mexico, Santiago de Chile, 2014 [online] http://repositorio.cepal.org/bitstream/handle/11362/37046/S1420371_es.pdf?sequence=1.

C. Information and communication technologies

Advances in information and communication technologies (ICTs) and the associated technological change are productivity drivers and therefore an important catalyst for countries' dynamic competitiveness.

The development of ICT, especially broadband internet, has revolutionized the processes of generation and exchange of information and changed the activities of everyday life. In addition to contributing to productivity, ICT advances can mean higher levels of social inclusion by providing public services such as education, health or government management, among others (see diagram III.1).

Diagram III.1
Broadband's economic contribution
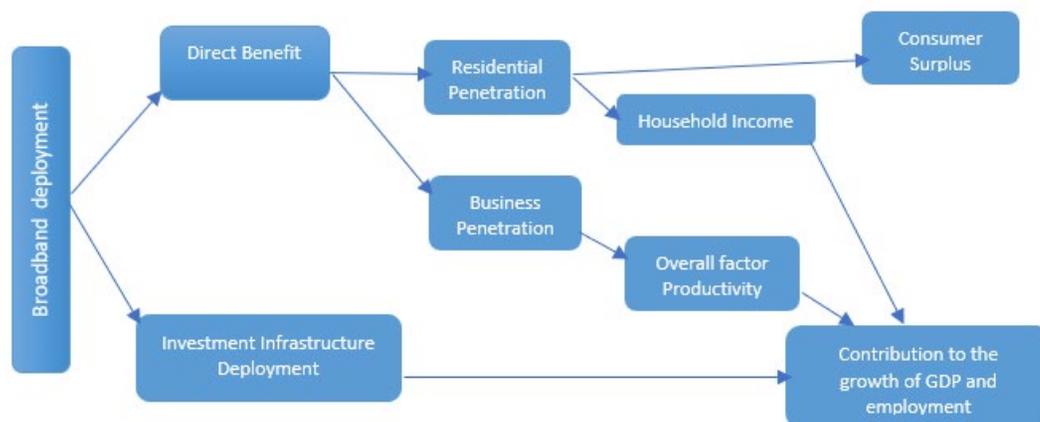
Source: Valeria Jordán, Hernán Galperin and Wilson Peres (coords.), Broadband in Latin America: beyond competitiveness, Santiago de Chile, Economic Commission for Latin America and the Caribbean (ECLAC) / Regional Dialogue Network on the Society of Information (DIRSI) and the European Union, 2013.

Empirical evidence shows that the higher the level of broadband penetration, the greater the impact on GDP growth. The implications in terms of public policy are therefore clear: maximizing the economic benefits of broadband depends on a significant increase of its penetration. Studies conducted for countries in Latin America and the Caribbean show that increases of 10% in the penetration rate imply GDP growths of around 0.03% and 0.08%.

Nonetheless, the impact on economic growth is subject to variables such as level of education and existing penetration (Jordan, Galperin and Peres, 2013). As shown in figure III.9, there is a direct relationship between the GDP contribution and the broadband penetration rate. In the case of the OECD countries, Panama, Colombia, Brazil and Latin America, it is noted that the higher the penetration rate, the greater the positive impact of broadband on GDP growth.

Figure III.9

Selected countries: comparative contribution of broadband to economic growth

(Percentages)
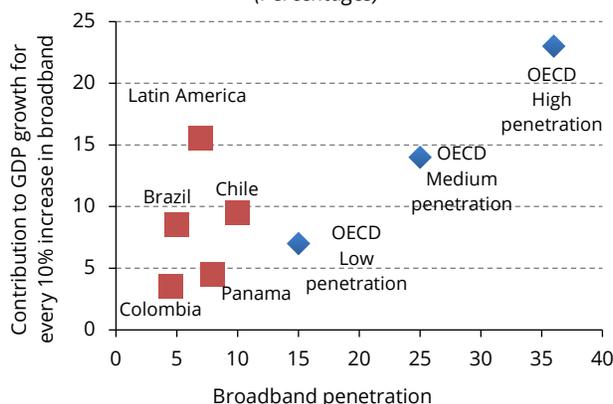
Source: Valeria Jordán, Hernán Galperin and Wilson Peres (coords.), Broadband in Latin America: beyond competitiveness, Santiago de Chile, Economic Commission for Latin America and the Caribbean (ECLAC) / Regional Dialogue Network on the Society of Information (DIRSI) and the European Union, 2013.

Figure III.10

Mesoamerica and selected countries: broadband subscriptions per 100 inhabitants, 2017
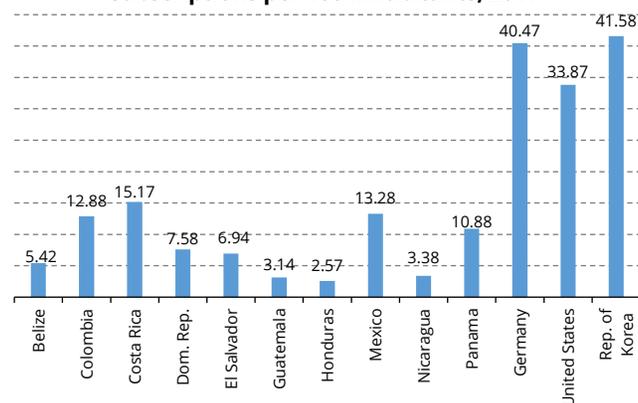
Source: United Nations, based on the International Telecommunication Union [online database] https://www.itu.int/en/ITU-D/Statistics/Pages/default.aspx.

Figure III.11

Mesoamerica and selected countries: percentage of population using internet, 2017

Source: United Nations, based on the International Telecommunication Union [online database] https://www.itu.int/en/ITU-D/Statistics/Pages/default.aspx.

As shown in figure III.10, broadband penetration levels in the Mesoamerica Integration and Development Project countries differ from those of the most advanced countries, limiting the ability of Mesoamerican economies to fully benefit from the potential of ICTs. The level of Internet use among the Mesoamerican population is low and medium, so the potential benefits of access to information are low (see figure III.11). Despite these limitations, it is worth noting the region's effort to expand telecommunications service coverage. Through the Mesoamerican Information Highway, more than 3,860 kilometres of optical fibre have been installed in 5,537 towers.

Given that the positive impact on economic growth depends on significant increases in the broadband penetration rate, public policy on Mesoamerican development is appropriate when seeking improvements in access to this service for the region's population and public institutions.

While telecommunication networks are key infrastructures for the countries' development, they can also deepen gaps between countries, as well as inequality between population groups within them. The benefits associated with ICT use can only be materialized if there are opportunities for access and use by the population, productive agents and public administration. This context calls for an adjustment in public policies in order to prevent the lag in digital development from having a negative impact on the population's ability to opt for a better life quality, a more promising future and greater enterprise competitiveness.

The use of broadband also requires work on facilitating access to other elements that are complementary to each other: access to the service, advanced content and applications, and devices and capabilities suitable for their use. It is not just another telecommunication technology or service, but a central element of a new system of social and productive relationships characterized by structural complementarities that are key to economic and social development with equity. In order to break the cycle of exclusion suffered by the poorest populations, it is necessary to facilitate access to these services and ensure the necessary complements for greater use.

IV. Transport

A. Transport and logistics infrastructure

Logistics infrastructure has a central role in economic development and in improving competitiveness by allowing the mobility of people, raw materials, inputs and products at an affordable cost for competitive goods and services production. Transport services also have a social role in providing the connectivity needed to access basic welfare, cultural, social and educational services for the entire population.

An advanced logistics gathers all those fundamental elements for the commercialization of goods from their point of production to the final consumer, integrating both the private sector's own activities and the State's action through its public policies of design, provision, facilitation and regulation of the activity.

In accordance with the requirements of greater competitiveness in international markets and economic development, the countries of the region have had to expand and modernize their infrastructure in accordance with new international technological needs and standards. However, this modernization has mainly focused on works aimed at foreign trade (e.g. ports, airports or major road corridors) and internal infrastructure has been neglected.

This has not only led to a progressive deterioration in the coverage and quality of people' lives but has also meant the loss of an excellent opportunity for the effective implementation of public policies, the full achievement of sustainable development goals and the realization of the very equality objectives.

In the region's ports and airports, the growth in the international traffic volumes, both cargo and passenger, respectively, causes great pressure on the available infrastructure. In general terms, this situation is being solved through a more productive use of historical investments, the optimization of processes and the incorporation of more technology, hand in hand with private investment. Furthermore, significant efforts have been made to have up-to-date information on the sector, such as the IABB'S Mesoamerican Regional Observatory for Freight Transport and Logistics. On its part, ECLAC brings together Latin American and Caribbean countries in its Maritime and Logistics Profile, an interactive tool with data and information on port activity, modal participation in international transport, and infrastructure endowment and performance.

However, continued demand for higher operating speeds, competitive tariffs and value-added services, together with an increase in the average size of transport equipment, mean that the demand for new infrastructure requires greater facilities. It may even be necessary to relocate these facilities, which may not only create a logistical bottleneck, but also a major source of conflict due to the relocation of these activities outside the traditional regional margins.

Regarding the crossing of land borders, there are some improvements in the physical infrastructure, where there even exist integrated controls between some countries. However, Central American logistics suffers from the lack of export support works, such as

refrigerated and consolidation zones, unloading, rest or phytosanitary control, which function quickly and safely for the cargo. It is also affected by weak technological infrastructure that does not allow optimal coordination of activities among the components of the logistics chain.

Likewise, regulatory discrepancies from one country to another make trade more expensive and hinder the development of interregional production chains. Logistical security is another important element, since interruption of a supply chain, whether by criminal acts, lack of inventory or any natural phenomenon that makes it impossible to distribute products, not only causes economic losses due to that particular failure, but also has an effect of spreading to the rest of the logistics chain.

Figure IV.1 shows a ratio of logistical performance based on the World Bank's Logistics Performance Indicator (LPI) for 2018 to per capita GDP according to the 2017 results. The distribution of the selected countries shows that there is a correlation between high GDP per capita and high logistical performance. In this graph, the Mesoamerican countries are agglutinated within the group of those with the lowest logistical performance and per capita GDP.

The required change to face the new logistical challenges imposes the need for a paradigmatic modification of sectoral public policy conception and design. It is necessary to stop thinking about modes of transport that use isolated infrastructures and to start thinking about integrated logistics and mobility systems. To this end, it is essential to apply the concept of co-modality, which should be understood as the optimal use of each means of transport and its combination with others, so that the entire journey is efficient and sustainable according to the particular needs of the service to be provided and the distance to be travelled.

The co-modal approach has great advantages in terms of emissions reduction compared to a unimodal system, as it allows for simultaneous implementation of actions that favour environmental and social sustainability while contributing to increased economic competitiveness.

Figure IV.1
Relationship between the logistics performance index and GDP per capita
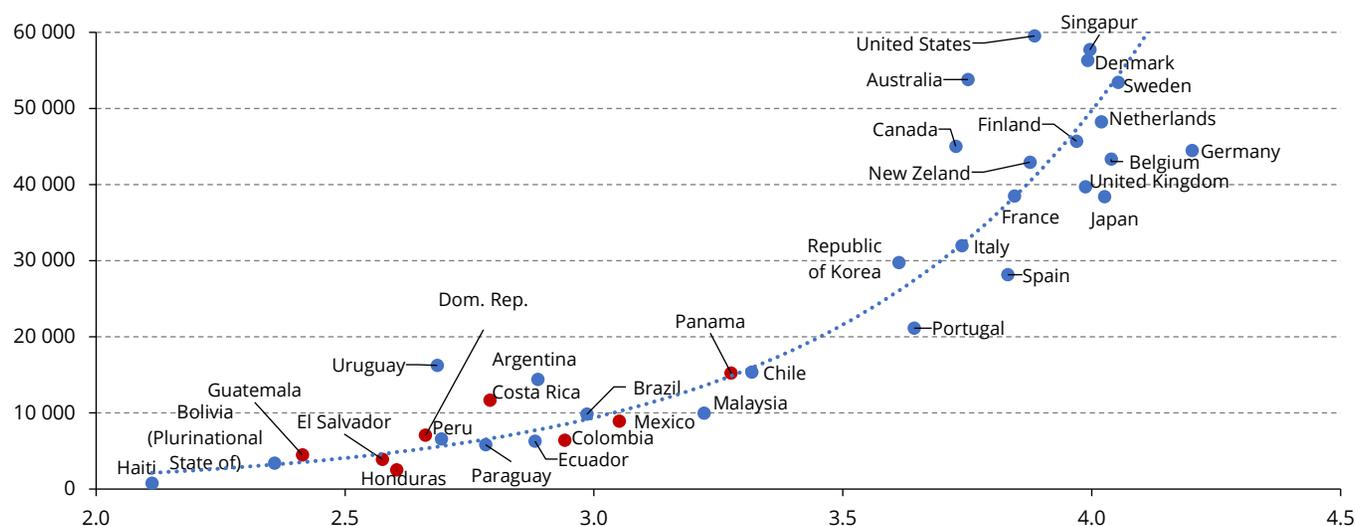
Source: Prepared by the author based on the World Bank, "Indicadores" [online database] https://datos.bancomundial.org/indicador?tab=all, 2018.
Note: GDP per capita data are for 2017 and are expressed in US dollars.

B. Investment in transport infrastructure

In the case of Mesoamerica, the Investment in Economic Infrastructure (INFRALATAM) database shows that countries are investing about 1% of their national GDP in the transport[2] sector. However, in order to meet the expected demand in the 2016-2030 period, they would have to invest around 2.2% of their GDP annually in transport infrastructure, including expenditure on routine maintenance and repairs. These values do not necessarily include design improvements or new materials and technologies. New investments associated with resilience, adaptation and mitigation of climate change referred to in the targets of the Sustainable Development Goals (SDGs) set out in the Agenda 2030 for Sustainable Development (see table IV.1) are not considered either.

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[2]   INFRALATAM is an initiative of the Inter-American Development Bank (IADB), the Latin American Development Bank (CAF) and ECLAC to create a database of public and private investment in economic infrastructure made by the countries of Latin America and the Caribbean. Available [online] http://infralatam.info/.

Table IV.1
**Mesoamerica: average investment
in transport sector, 2008-2015**
(Percentages of national GDP)

Country	Transport Investment
Belize	0.96
Colombia	2.56
Costa Rica	1.25
Dominican Republic	1.32
El Salvador	0.93
Guatemala	1.23
Honduras	2.21
Mexico	0.77
Nicaragua	1.99
Panama	3.68

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on data on Investment in Economic Infrastructure (INFRALATAM), 2018 [online] http://infralatam.info/.

As part of its effort to improve transportation infrastructure, the Mesoamerican International Highway Network has shown significant progress. 3.244 km (km) of the Mesoamerican Integration Corridor; 2.906 km of the Atlantic Corridor; 1.946 km of the Caribbean Touristic Corridor; and 4.255 km of regional branches and connections have been completed (see map IV.1).

Map IV.1
Co-modal transportation in Mesoamerica Project

COMODAL TRANSPORTATION
IN THE MESOAMERICA PROJECT

— Mesoamerican Integration Corridor (Pacific Corridor): 3 244 km
— Atlantic Corridor: 2 906 km
— Touristic Corridor (1 946 km), branches and regional connections (4 255 km)
······ Railway transportation: ten feasible connections
 ● Short Distance Maritime Transportation (SDMT): study of 49 ports and Chiapas-Quetzal pilot
══ SDMT routes priorized
 Mesoamerican Biological Corridor (MBC) – EMSA

Source: Mesoamerica Project.

C. Road network provision

In Latin America (17 countries), the road extension in relation to land area increased by just over 8% between 2007 and 2015, reaching 18 km of road per 100 km2. As shown in figure IV.2, the increase in road density for 2007-2015 occurred in all Mesoamerican countries, including Colombia, Costa Rica, Nicaragua and Panama.

The countries with the highest road density by land area in 2015 are Costa Rica, Dominican Republic and El Salvador. However, these relative stocks do not consider the infrastructure quality. Most of the roads in the region are not major roads, so their designs and treatments vary, and, among them, many do not consider a type of covering or layer (pavement), so they do not have a bearing surface suitable for transit (and the weight transported, whether by cargo or passengers).

Among these are the cases of El Salvador, Dominican Republic, Guatemala, Panama and Mexico, where the proportion of paved roads over the total exceeds 40%. Likewise, considering the paved road density in relation to the land area, Costa Rica also stands out (as does Dominican Republic and El Salvador) with over 20 km per 100 km2 (Chauvet, 2018).

Figure IV.2
Mesoamerica: total road network density, 2007 and 2015
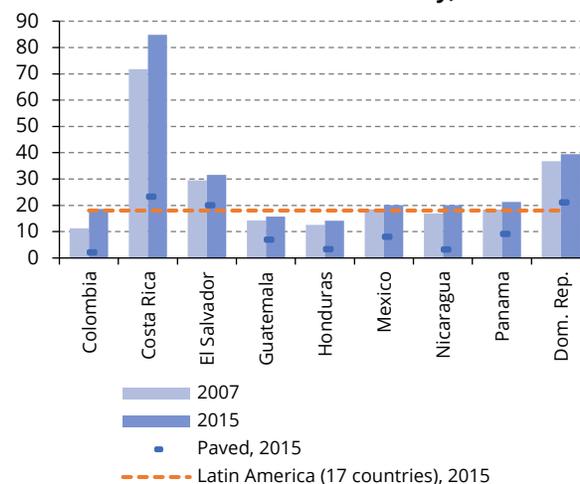
Source: Economic Commission for Latin America and the Caribbean (ECLAC), Preliminary Overview of the Economies of Latin America and the Caribbean, 2018 (LC / PUB.2019 / 1-P), Santiago, Chile, 2019a.

D. Port movement evolution

With Panama's exception, the region has many small ports, in many cases operated by public entities with low performance levels. Regional fragmented structure of the sector, dredging problems and lack of modern equipment have limited the scale of vessels serving the area, which has not stopped a significant increase in port activity in the Mesoamerican region, as well as the arrival of global port operators.

Table IV.2 shows that, in recent years, many countries in the region have seen significant increases in volume, some even doubling their total national movement (including empty and cabotage). These numbers reflect enormous challenges to the available port infrastructure and quality of national logistics services.

Table IV.2
Mesoamerica: containers mobilized,
quantity evolution in TEUS, 2005-2017

Country	2005 (TEU)	2013 (TEU)	2017 (TEU)	Evolution (between 2005 and 2017)
Belize	36 388	40 978	44 381	22.0%
Colombia	1 198 756	3 128 901	3 956 466	230.0%
Costa Rica	762 108	1 246 829	1 489 210	95.4%
Dominican Republic	642 988	1 446 402	1 842 616	186.6%
El Salvador	103 483	180 634	209 903	102.8%
Guatemala	685 538	1 211 561	1 389 751	102.7%
Honduras	553 013	671 467	831 555	50.4%
Mexico	2 133 452	4 875 281	6 375 338	198.8%
Nicaragua	46 300	98 155	171 881	271.2%
Panama	2 771 707	6 561 396	6 898 246	148.9%
Total Mesoamerica	8 933 733	19 461 604	23 209 347	159.8%

Source: Economic Commission for Latin America and the Caribbean (ECLAC), "Maritime and Logistics Profile of Latin America and the Caribbean" [website] http://perfil.cepal.org/l/es/start.html, 2019b.

Note: TEU= is a measure of maritime transport capacity in containers.

Mesoamerican supply chain logistics organization shows strong contrasts. Large companies with local or foreign capital carry out integrated management, control the entire logistics chain and achieve high efficiency levels (maquila, agriculture bulk, etc.). On the other hand, there are small producers and entrepreneurs who lack the training and scale to manage their logistics efficiently and therefore pay higher logistics costs, which makes them less competitive.

Demographic change, as well as labour productivity and structural changes are impacting long-term demand growth. The moderate global trade growth rate is also determined by several other factors such as increased protectionism, currency wars, near-shoring, downsizing of goods, saturation of container penetration (containerization) and the silent recovery of consumer spending (due to demographic changes).

Furthermore, the emergence of new global competitors and important technological transformations in the sector also mean direct and indirect threats to the industry due to interconnectivity, globalization and a great power concentration in a reduced number of actors, which could have negative effects on the region's competitiveness and connectivity (Sánchez and Barleta, 2018).

E. Policy recommendations

The integration of regional economic infrastructure represents a lower-cost alternative solution to close the infrastructure gap discussed in previous sections. This is due to the integration and specialization of some infrastructures to provide sub-regional services (ports, airports, energy integration or telecommunications services) that would allow the same level of service to be achieved, in terms of coverage and quality, with less investment and a lower operating cost, thanks to network economies.

It would also make it possible to provide and ensure a continuous and secure supply for the participating economies. In this way, a necessary redundancy would also be achieved in the network in the event of extreme natural phenomena or connectivity losses, which would be difficult to accomplish individually at a competitive cost. Lastly, this would release public resources that could be used for social spending or other national economic sectors.

Another highlight in the Mesoamerican region relates to the ongoing incipient expansion of existing modal options, aiming at increasing logistics operations' energy efficiency and promoting resilient regional infrastructure projects adapted to climate change.

To this end, the States, with the support of various existing integration initiatives, multilateral organizations and international cooperation, intend to improve regional connectivity not only through highways, as has been the case until now, but also through other modalities such as short distance mantime transportation cargo and passenger ferries, as well as the possibility of reactivating the Mesoamerican rail network.

Under this paradigm shift, a network of regional services could be designed to combine and integrate present and future infrastructures in order to improve people's mobility and cargo logistics, thereby reducing operation and maintenance costs, as well as the negative social and environmental externalities that arise.

Along with these technical aspects, it is essential to continue deepening political processes and to cultivate trust among the countries in order to gradually advance towards an integrated space, where infrastructure is the thread that connects and enables the full integration of the different territories and their inhabitants.

It is crucial for the management of a regional infrastructure to create an ad hoc regulatory organization, independent and well-structured for the type of tasks to be performed. This entity would have to promptly mediate possible disputes between participants in the system and transparently set access and operating tariffs that ensure competitive access for new participants and non-discrimination between actors of different sizes or offering different types of products.

Regardless of the operation selected or the infrastructure to be implemented, the State must not lose sight of the long-term vision. To this end, it must ensure from the beginning the rights of way or easements associated to other shared-use infrastructures that may be developed in the future (for example, optic fibre, power lines and oil pipelines).

ECLAC has been developing a series of studies in order to characterize regional infrastructure and provide countries with guidelines to help them improve their public policies and investment plans (Perez-Salas, 2018). Reducing the infrastructure gap is a necessary, though not enough, condition for the sustainable development of the region. It is not only necessary to invest more, but also to do it in a better way and incorporating sustainability criteria in the broadest sense.

Aiming to solve these deficiencies and achieve the SDGs, ECLAC has raised the need for a new infrastructure governance. It is intended to address in an integrated and sustainable way the infrastructure and the flows of services that use it, as the only way to ensure progress and the well-being of its current and future final users (Jaimurzina and Sánchez, 2017).

To move forward in this area, countries should coordinate infrastructure works and harmonize technical and regulatory procedures in order to promote complementarity among different economies. In that way the operating costs and negative externalities on the environment and society could be reduced. In this sense, ECLAC has emphasized the need to align the conception, design, execution, monitoring, supervision and evaluation of infrastructure policies and related services with maximization of their development impact.

This could be achieved through an integrated and sustainable logistics and mobility policy with a regional perspective (Pérez-Salas, 2008), which could solve the problems of providing infrastructure and services. It would be necessary to solve institutional and regulatory failures or obstacles, both in the conduction of policies and in the organization of markets that arise from the high dispersion and multiplicity of public visions regarding economic infrastructure and services in their different processes (conception, design, implementation and monitoring, inspection and evaluation).

In response to the mandates given to ECLAC by the Tenth Summit of Heads of State and Government of the Tuxtla Mechanism for Dialogue and Coordination, held in June 2008, ECLAC proposed a dialogue on the need for a regional framework policy on logistics and mobility, in order to improve the competitiveness and international integration of the regional countries in a context of cooperation.

Since then, numerous studies, national workshops and technical assistance have been carried out in order to design and adopt a regional logistics and mobility policy, which were embodied in the document *Logistics and Mobility Policies for Sustainable Development and Regional Integration: Conceptual Framework and Regional Experience* (Jaimurzina, Pérez-Salas and Sánchez, 2015). This document provides a set of recommendations for a national logistics and mobility policy, as well as its coordination at the Central American level, considering the situation of the regional countries and the convergence with the other integration initiatives existing in Latin America and the Caribbean.

For the framework policy to be a real tool for regional development, a series of actions and reforms must be undertaken to establish a process that will allow progressive advances in its implementation. Among these actions, the following stand out as urgent priorities:

a) Strengthen coordination among countries as a central aspect in achieving better integration, especially regarding the evaluation and funding of specialized infrastructure to provide regional services.

b) Involve the private sector and civil society as relevant actors in the process to ensure implementation and long-term commitment. This is essential if we want to promote the adoption of concrete measures that reflect the spirit of the framework policy in a true development tool, independent of the governments in power and their commitment to regional integration.

c) To establish methodologies and procedures that allow prioritizing and funding sub regional infrastructures, with a perspective to favour complementarity among the different economies.

d) Financing international works: much of the funding of infrastructure is done through loans that often make it difficult to apply a comprehensive perspective on the territory and infrastructure services.

e) To agree with the countries on a regional integration strategy which recognizes and values the existing differences in the prevailing model of society and, at the same time, can articulate the different technical and economic rules and regulations around an ideal of convergence that fosters logistical and productive integration.

f) ECLAC has highlighted the need to strengthen the progress made in trade liberalization. This could be achieved through the improvement of regional integration processes, as well as the harmonization and integration of existing trade treaties. The inefficiencies associated to failures in physical infrastructure coverage and quality, as well as the lack of harmonization in regulatory matters, constitute a determining limitation for the region's competitiveness and sustainable development. Likewise, infrastructure planning with a long-term perspective and stable sectoral investment makes it possible to efficiently accompany productive transformation and achieve a better adaptation to economic changes and to the new social and environmental concerns that arise with development (Pérez-Salas, 2017).

V. Energy

Members of the Mesoamerica Integration and Development Project have different energy profiles. On one hand, Mexico and Colombia have large reserves of oil and natural gas, and on the other, the SICA countries are net importers of oil and its derivatives (see figure V.1). Due to dependence on hydrocarbons imports, SICA countries have taken steps to diversify their energy matrices and promote greater use of renewable energies. Mexico, with a more diversified energetic matrix, presents as relevant tendencies the increase in the participation of natural gas and declining on oil production.

Figure V.1
Mesoamerica: primary energy production, 2000-2017
(Millions of barrels of oil equivalent)
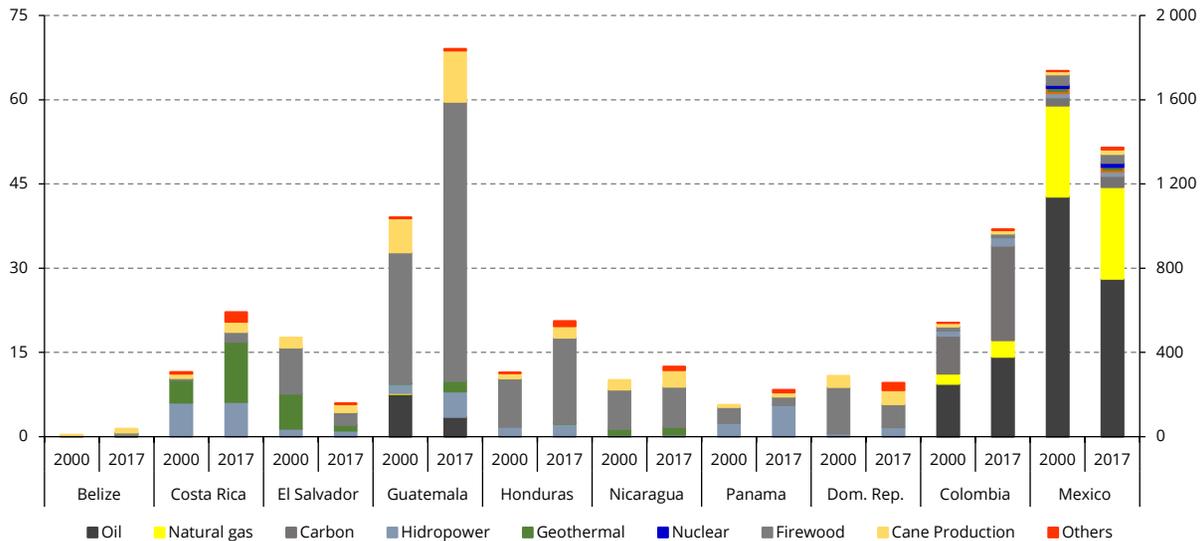
Source: Latin American Energy Organization (OLADE), based on the Economic-Energy Information System (SIEE) [online database] http://www.olade.org/producto/sie-regional-2/modulo-siee/.
Note: The right axis shows the figures for Colombia and Mexico.

A. Energy context: dependence on firewood as a source of primary energy in Central America

In Mexico and Colombia crude oil and natural gas have a significant role in primary energy production. Coal is also a key component of primary energy in Colombia due to the large coal reserves available that make it the largest coal exporter in Latin America.

For SICA member countries, firewood represents a significant part of primary energy production, mainly in Honduras, Guatemala, Nicaragua, Panama and the Dominican Republic. Firewood is consumed by families in rural areas, primarily for cooking. This is a cause of concern because of the harmful impacts on the environment and human health, since most stoves do not have adequate smoke removal systems.

Belize and Guatemala are the only SICA countries with small reserves of crude oil and production, which is exported almost entirely.

B. Dependence on oil products

Hydrocarbons are the largest source of final energy in the countries of the region. Mineral coal plays an important role in Colombia, while in SICA countries firewood is more relevant. Mexico's final energy consumption is substantially higher compared to the rest of the MP countries, about three and a half times higher than SICA countries, and these in turn surpass Colombia's consumption by 10% (see figure V.2).

Figure V.2
Mesoamerica: final energy consumption by source, 2000-2017
(Millions of barrels of oil equivalent)

Legend: Oil — Natural gas — Mineral carbon — Firewood — Cane Production — Electricity — Oil derivates — Charcoal — Others
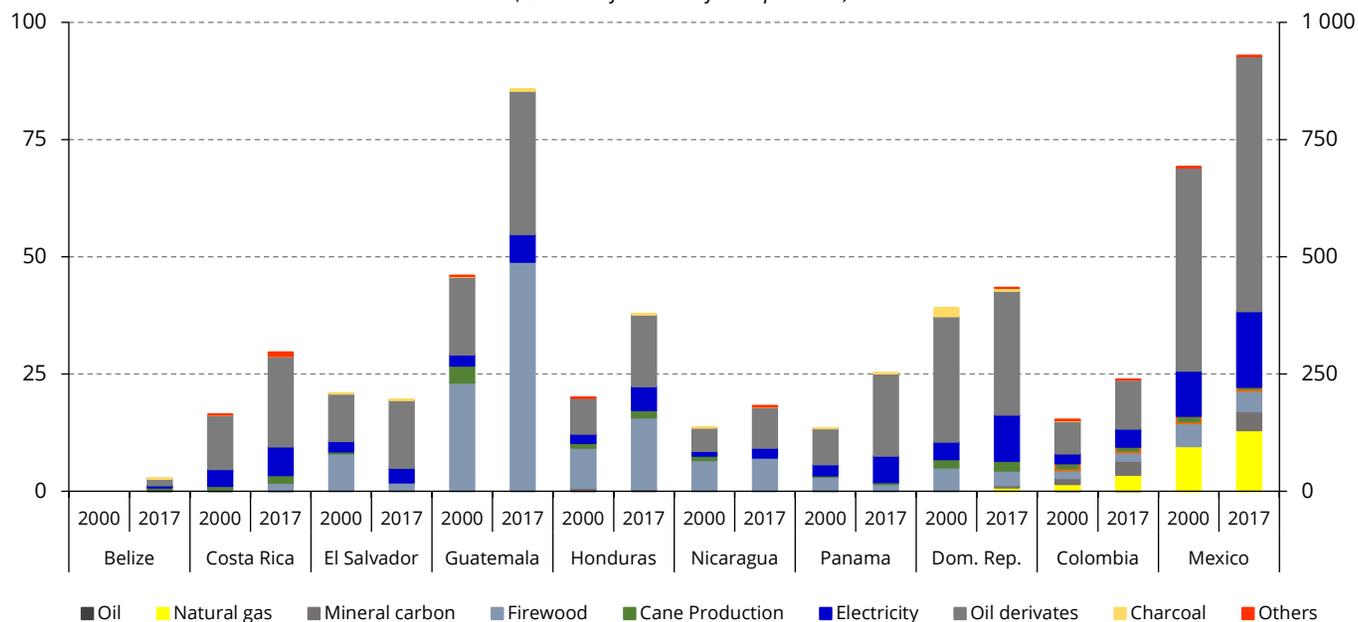
Source: Economic-Energy Information System (SIEE) of the Latin American Energy Organization (OLADE). Note: The right axis shows the figures for Colombia and Mexico.

C. Energy efficiency

In terms of energy efficiency, measured as the amount of energy needed to generate a unit of wealth (GDP), there is a 10% decrease across the region when total final energy consumption (total final consumption/GDP) is considered; only Guatemala shows a 5% increase in this indicator. It is observed that countries that are more dependent on firewood show higher energy intensity.

In the consumption of hydrocarbons, the decrease in oil intensity is evident, measured as the total consumption of hydrocarbons per unit of the GDP. The decrease reaches 28.4%. The most noteworthy cases are Honduras, with a decrease of only 1.1%, and the Dominican Republic, where the decrease is 51.9%.

As for electricity intensity, there has been a 7.9% increase in the region, although the trend is not generalized in all countries (see table V.1).

Table V.1
Mesoamerica: energy intensity, 2000-2017

Country	Energy Intensity (bep/1 000 dollars 2010)		Oil Intensity (barrel/1 000 dollars 2010)		Electricity Intensity (MWh/1 000 dollars 2010)	
	2000	2017	2000	2017	2000	2017
Region	0.815	0.736	0.744	0.532	0.179	0.194
Panama	0.814	0.530	0.656	0.578	0.286	0.217
Dominican Republic	1.173	0.566	1.495	0.719	0.327	0.195
Costa Rica	0.671	0.617	0.511	0.419	0.261	0.229
Colombia	0.796	0.638	0.474	0.408	0.185	0.168
Mexico	0.755	0.723	0.800	0.573	0.171	0.202
El Salvador	1.382	0.888	0.913	0.806	0.270	0.301
Nicaragua	2.080	1.454	1.240	0.981	0.336	0.351
Guatemala	1.544	1.623	0.709	0.613	0.176	0.199
Honduras	1.887	1.840	0.970	0.959	0.380	0.471

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on official data; Latin American Energy Organization (OLADE), on the base of Energy-Economic Information System (SIEE).
Note: Countries are presented by energy intensity in 2017.

D. Breakthroughs in the 2030 Agenda for Sustainable Development

Sustainable Development Goal 7 (SDG 7) of the 2030 Agenda for Sustainable Development seeks to ensure access to affordable, reliable, sustainable and modern energy for all, with the aim of achieving universal access to affordable, reliable and modern energy services; significantly increasing the share of renewable energy in the total of energy sources; duplicating the global rate of improvement in energy efficiency; and enhancing international cooperation to facilitate access to modern energy services.

SDG 7 matches the initiative launched by the UN Secretary General in 2011 (Sustainable Energy for All, SE4all). The information presented helps to sketch a synthetic picture of the progress of SDG 7 in the ten countries.

1. Access to modern energy services

Despite the advances in the electrification level, by 2017 Mesoamerica still lags in the universalization of electricity access. Costa Rica, with the highest level of coverage at 99.4%, is at a level where progress is more difficult and expensive. However, the country has the advantage of having well-located the few populations without access to electricity.

Mexico, with a coverage of 98.6%, still has a high population (about 1.7 million inhabitants) without access to modern energy.

Colombia, El Salvador and the Dominican Republic have high access to electricity in about 97%, followed by Belize with close to 95% of coverage. Guatemala, Nicaragua and Panama have coverage of over 92%. Honduras reports the lowest value of population with access to electric service with 77.2%. Despite their low coverage, there was some significant progress between 2000 and 2017 (see figure V.3).

The population without electric service in Mesoamerica exceeds seven and a half million inhabitants. Honduras exceeds two million; Mexico has 1.7 million. In Colombia there are 1.4 million and in Guatemala 1.2 million. The case of Nicaragua stands out, where an aggressive electrification program has been implemented in rural communities and service regularization has increased the number of electrified families considerably in recent years.

The numbers on the matter had an overestimation for many years, therefore the census carried out a few years ago helped to have real figures on electrification. The inaccuracy in the information could be due to different factors, among the main ones the outsourcing of the measurement and billing services of electricity consumption, and the high levels of electricity losses.

In the ten countries, most of non-electrified population is in remote rural communities that lack basic infrastructure. In places that are difficult for electricity grids to access, the alternative of coverage with isolated photovoltaic installations continues to become more popular and represents a viable opportunity for universalization due to decreasing costs.

Figure V.3
Mesoamerica: Electricity Coverage, 2000 and 2017
(Percentages of households with access to electricity)

Country	Year	Value
Costa Rica	2017	99.4
Costa Rica	2000	
Mexico	2017	98.6
Mexico	2000	
Dom. Rep.	2017	97.6
Dom. Rep.	2000	
Colombia	2017	97
Colombia	2000	
El Salvador	2017	96.7
El Salvador	2000	
Belize	2017	94.8
Belize	2000	
Panama	2017	92.9
Panama	2000	
Guatemala	2017	92.4
Guatemala	2000	
Nicaragua	2017	92.3
Nicaragua	2000	
Honduras	2017	77.2
Honduras	2000	

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on official data for the countries of the Central American Integration System (SICA); Latin American Energy Organization (OLADE), based on the Latin American and Caribbean Energy Information System (sieLAC) for Colombia and Mexico.

2. Participation of renewable energies in electricity generation

The participation of renewable energies has expanded in electricity generation in recent years, in addition to greater diversification in the countries of Mesoamerica, mainly in the so-called variable renewable energies (solar and wind power) and a greater use of biomass (agro-industrial cogeneration and use of biogas).

In 2017, 36.3% of the total energy generated (464.7 TWh) was generated with renewable energies. A quarter of the total generation was carried out with hydroelectric power stations. Wind energy generation participated with 3.1%, nuclear and biomass generation contributed 2.3% each one, geothermal generation participated with 2.1%. and photovoltaic generation and other minor sources contributed 1%.

Of the total energy generated in 2017 there are strong differences by country. Mexico participated with 70.8%; Colombia. with 14.3%; Dominican Republic, 3.5%; and the other seven countries together reached 11.3%. Costa Rica, Belize and Colombia are the leaders in integrating renewable energies into their electricity matrix (99.7%. 91.3% and 87%. respectively). The other five

Central American countries generated between 54% and 75% of their total electricity with clean energy.

The countries with the lowest participation of renewable energy are Mexico with 21.1% and the Dominican Republic with 16.8%. It is recognized that both countries have gradually and steadily reduced the percentage of participation on fossil fuels in recent years (see figure V.4).

Hydroelectric energy concentrates the largest share of renewable energies in the Mesoamerican region; it reaches 118.6 TWh and represents 70% of the total generation with clean energies (2017). This high-level carry vulnerability derived from unpredictable effects such as El Niño or La Niña climate phenomena.

Of the total generation by country, hydroelectric generation represents 86% in Colombia, 77% in Costa Rica, 70% in Belize, about two thirds in Panama, half in Guatemala and a third in El Salvador and Honduras. In Nicaragua, the Dominican Republic and Mexico it only represents 13.3%, 11.3% and 9.7% respectively (see figure V.5).

Electricity generation with geothermal power plants reached 9.6 TWh. Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Mexico have a share of this source in their generation matrix. In El Salvador, these power plants participated with 28.8% (1.46 TWh) of their total and in Nicaragua with 16.6% (0.68 TWh).

Figure V.4
Mesoamerica: sources for electricity generation, 2000 and 2017
(Terawatt/hour)
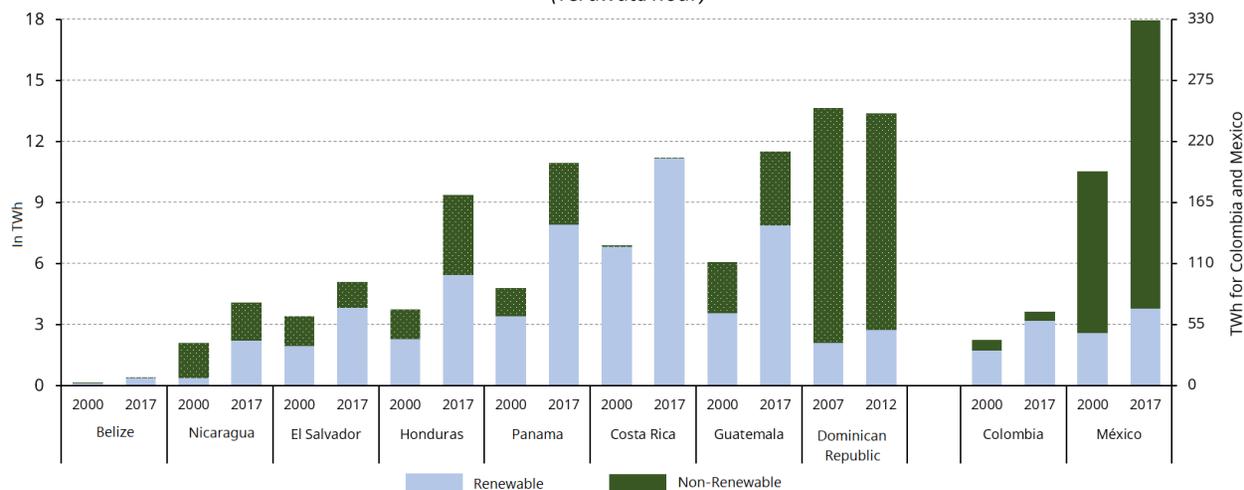
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on official data for the countries of the Central American Integration System (SICA) and the Latin American and Caribbean Energy Information System (SieLAC)-Latin American Energy Organization (OLADE) for Colombia and Mexico.
Note: Colombia and Mexico refer to the right axis.

Even though the region still has great potential to develop, geothermal energy continues to grow very slowly, a trend that is explained by the high costs and risks in the pre-investment (exploration) phases and, in some cases, by environmental conflicts. Mexico and El Salvador have used it since the 1960s and 1970s, respectively. Subsequently, Nicaragua (1983), Costa Rica (1994), Guatemala (1998) and Honduras (2017) began to use geothermal heat to produce electricity.

Wind energy has a growing presence in eight MP countries and there are projects under construction in El Salvador. The wind power plants generated 14.2 TWh. In Nicaragua the generation with this source was 0.62 TWh, 15.3% of the total; in Costa Rica 1.29 TWh,

11.5% of its total; and in Honduras it represents 9% of the total. Although Mexico has the largest wind power generation with 10.6 TWh, it only represents 3.2% of its total.

Photovoltaic power plant generation has grown by leaps and bounds in the region and reached 1.85 TWh in 2017. In Honduras it reached 0.92 TWh, which represents 9.6% of its total. In almost all the other countries it shows exponential growth, although its share is small. The reduction of costs in non-conventional renewable energies (especially solar and wind) and the abundance of these resources in the region suggest that the participation of these technologies will continue growing.

Figure V.5
Mesoamerica: disaggregation of renewables sources for generation, 2017
(Terawatt/Hour)
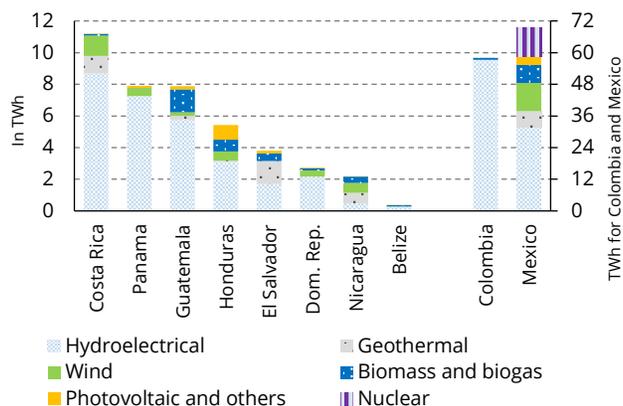
Source: Economic Commission for Latin America and the Caribbean (ECLAC) based on official figures for SICA countries, Mining Energy Planning Unit (UPME) is a special administrative unit, of a technical nature, attached to the Ministry of Mines and Energy of Colombia and Sener of Mexico.
Note: Colombia and Mexico refer to the right axis.

Mexico is the only country that participates with nuclear power generation with 10.9 TWh, which represents 3.3% of its total generation. Biomass generation is around 11 TWh. Belize generates 20.6% of its energy in its mills, Guatemala 12.3% and Nicaragua 10.3%. Biomass generation has a promising future in the region due to the amount of resources, but it is first necessary to quantify the potentials of the different biomass sources in a geo-referenced form. The SICA-Bioenergy platform, a statistical and geographic system for evaluating the energy potential of biomass resources, supported by SICA, UNAM and ECLAC, is noteworthy.

3. Energy efficiency

The slower growth in electricity demand experienced by several of the countries could reflect a more rational use of electricity. Unaccounted distributed generation could also have an impact on this effect. The irruption of efficient lighting technologies for more than a decade, as well as other measures taken by countries, suggest that there have been improvements in energy efficiency (EE).

An examination of the intensity of the electrical subsector (the electrical energy used to produce one million dollars of GDP), shows a gradual reduction of this indicator from 2005 onwards. In 2017, the SICA countries used 0.24 TWh to produce one million dollars of their GDP (10% less than in 2005). More information on electricity demand (by sector and subregion) and useful energy balances are needed to have conclusive information on these issues.

Electricity losses, specifically non-technical losses, influence the improvement of the EE. Despite the efforts of the ten countries, electricity losses remain a pending issue in several of them. In Colombia and Mexico progressive reductions in the amount of losses are observed. In Mexico, in 2017, non-technical losses were 18.3 GWh, equivalent to 7.6% of the energy received, with an economic value of 1.5 billion dollars.

The main actions to reduce and control non-technical losses are related with the implementation of new measurement technologies, the reinforcement of medium voltage meter verification programs, the replacement of electromechanical meters by electronic ones and the detection and attention of anomalies by means of statistical selection of services.

In SICA, with the exception of Belize, Costa Rica, El Salvador and Panama, the rest of the countries face heavy technical and non-technical electricity losses after net generation, which are very high and even exceed 20% in three countries: Honduras, Nicaragua and the Dominican Republic (see figure V.6).

Figure V.6
Mesoamerica: electricity losses
in selected years, 2000-2017
(Percentages of technical and non-technical
losses after net generation)
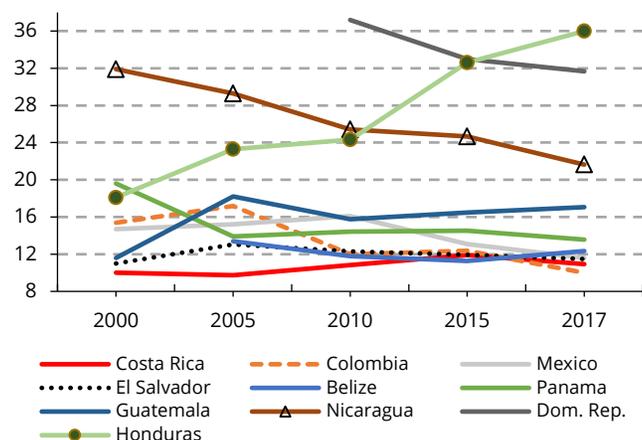
Source: Economic Commission for Latin America and the Caribbean (ECLAC) based on official data for the countries of the Central American Integration System (SICA); Latin American Energy Organization (OLADE) based on the Latin American and Caribbean Energy Information System (sieLAC) for Colombia, and Secretariat of Energy (SENER) for Mexico.

The problem of losses, in addition to causing a deficit in the financial statements of distribution companies and the electricity system, also leads to "financial outages", affecting the reliability of supply, which translates into additional costs for companies and other inefficiencies that harm the competitiveness of the economies of the subregion.

All MP countries acknowledge the relevance of this problem and therefore are working on strategies to reduce generation costs and provide accessible and enough energy, while reducing losses and lowering operational costs for companies. For example, in the context of the Central American Energy Strategy 2020, SICA countries agreed to reduce their level of electricity losses to 12% or less by 2020, although most have modest results by 2017.

Colombia and Mexico also pursue loss reduction goals established in national strategies and programs for rational and efficient energy use. A conservative estimate for the MP countries concludes that one percentage point decrease in electricity losses would allow benefits of the order of 130 million dollars per year. Reaching a target of 12% losses would provide the ten countries of the Mesoamerica Integration and Development Project with benefits estimated at more than 2 billion dollars per year, of which two thirds would correspond to Mexico, 22% to the SICA countries and 12% to Colombia.

E. Integration of electricity markets

The Central American Electrical Interconnection System (SIEPAC) is undoubtedly one of the most successful regional integration initiatives in Latin America and the Caribbean. The 400-kw regional electrical interconnection of almost 1,800 kms in length started with the first studies carried out in 1987. The commitment to Central American energy integration was embodied in the signing of the Framework Treaty for the Central American Electricity Market, signed at the end of 1996. This regional electricity market (MER) received subsequent international support with the interest of Colombia and Mexico in participating in the Treaty.

The infrastructure of the first circuit of the main interconnection of the transmission networks from Guatemala to Panama is fully completed. In September 2014, the last section of the SIEPAC line was powered up. With the operation of this section located in Costa Rica, SIEPAC's network allows the transaction of electricity between all countries in the region.

Through a resolution in 2014, the Regional Electricity Interconnection Commission (CRIE) set the minimum international exchange operating capacity between any pair of MER member countries at 300 MW. The regional electricity system was designed to transfer this amount of power between countries through the SIEPAC line, however, the current transfer limits between countries vary between 60 MW and 300 MW. The most critical restrictions are detected in the regional transmission networks of Honduras, Nicaragua and Panama, which cause limitations to energy transactions, a situation that becomes more severe in rainy months.

Since 2010, Guatemala and Mexico have had a binational interconnection that links the "Tapachula" and "Los Brillantes" substations. Belize and Mexico have also been interconnected since 1998. Colombia and Panama have advanced in the studies and agreements for the connection of their two systems. The MER has been operating since 2001, although regional market regulations were not approved until 2005. Member countries are currently studying how to strengthen and improve the functioning of MER to allow for long-term contracts and strengthen MER and SICA organizations, such as the Council of Energy Ministers. Introducing alternatives such as gas interconnection is also on SIEPAC's agenda for the near future.

Regional electricity trade has had an upward growth since 2012, rising from 536 GWh to 3260 GWh in 2017, driven by Mexico's growing exports to Guatemala. Progress in the integration of Central American energy markets has been favoured by the implementation of firm contracts in the MER. In addition, the lack of investments in some countries to replace expensive generation technology with high energy generation costs has caused the increase of their imports.

Regional electricity trade reached 3,260 GWh in 2017 using interconnections (see figure V.7). Belize imported 230 GWh from Mexico. In the MER the injections were 2,447 GWh, 25% more than the injections in 2016 (1947 GWh). Guatemala remains the largest exporter, responsible for 70% of exports to SIEPAC MER, followed by Panama (13%) and Costa Rica (8%). In importing positions are El Salvador (65%), Honduras and Nicaragua (both with 13%).

The evolution of MER transactions from 2013 to 2017 shows a clear growing trend of Guatemala as an exporter and El Salvador as an importer. Finally, electricity transactions between Guatemala and Mexico play an important role. In 2017, the first country imported from the second 816.5 GWh and exported 103.8 GWh, which gives a net importer balance to Guatemala of around 713 GWh, 38% higher than the value recorded in 2016. In conclusion, Guatemala's export position to MER (1,741 GWh in 2017) has been leveraged by imports from Mexico.

Figure V.7
Mesoamerica: electricity exchanges, 2017
(Gigawatts)
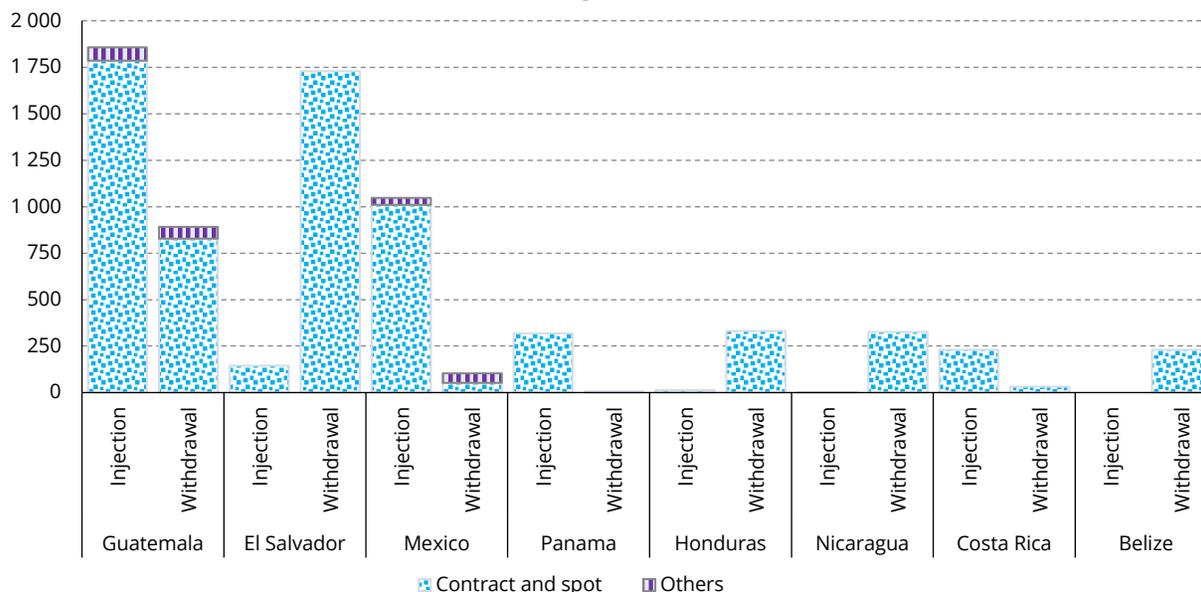
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on official figures; Ente Operador Regional (EOR) for Central America; Ministerio de Energía, Ciencia y Tecnología y Empresas de Servicios Públicos (MESTPU) and Belize Electricity Limited (BEL) for Belize.
Note: For Mexico only exchanges with Belize and Guatemala are considered (source is MESTPU and AMM, respectively). Energy "injections" represent the energy exported to neighbouring countries at the respective border nodes. Similarly, "withdrawals" represent imported energy. The heading "other" includes emergency exchange energy, unnoticed energy, bonuses and adjustments.

VI. Health

Between 2000 and 2018, the population of the countries of the Mesoamerica Integration and Development Project increased from 185 million to 235 million, and it is estimated that, according to this trend, in 2025 the total population of the countries mentioned would reach 256 million inhabitants, a figure equivalent to 37% of the total population of Latin America and the Caribbean.

The growth of the Mesoamerican population will be followed by its ageing. Based on the period 2000-2005, life expectancy has increased in all countries of the region (see table VI.1), in line with the trend in Latin America and the Caribbean as a whole. Population ageing will arrive earlier for Costa Rica, Mexico and Panama. These three countries are above the projected average for the region (77 years) between 2020 and 2025. The rest of the countries are in transition to their demographic bonus point.

According to the Latin American and Caribbean Demographic Center (CELADE), in 2043 the SICA countries would reach their maximum bonus point and its population between the ages of 15 and 65 would represent about 67% of the total. That number is currently 61%. The existing gaps and common challenges in health matters provide opportunities for greater regional cooperation in this sector.

Table VI.1
Mesoamerica: life expectancy at birth, 2000-2025
(Years)

Country	2000-2005	2005-2010	2010-2015	2015-2020	2020-2025
Belize	68.5	69.6	69.8	70.7	71.6
Colombia	71.8	73.0	73.8	74.6	75.5
Costa Rica	77.8	78.4	79.2	80.1	80.9
Dominican Republic	71.2	72.3	73.3	74.2	75.0
El Salvador	69.7	71.2	72.7	74.2	75.5
Guatemala	69.0	70.3	72.6	73.9	75.4
Honduras	71.0	72.0	72.9	73.8	74.7
Mexico	74.9	75.7	76.5	77.3	78.0
Nicaragua	70.9	73.0	74.6	75.8	76.8
Panama	75.6	76.4	77.4	78.2	79.1
Latin America and the Caribbean	72.1	73.4	74.6	75.7	76.7

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.

The persistence of infectious and contagious diseases, commonly related to poverty (malnutrition, leishmaniasis, trypanosomiasis, trachoma, onchocerciasis, helminthiasis, rickettsiosis and tuberculosis) as well as the healthy years of life lost as a result of violence, creates a stress scenario for public health systems. As can be seen in figure VI.1, in most MP countries the trend in public spending on health is slightly higher. However, population growth, combined with the phenomenon of ageing, will exacerbate financial pressures and challenges in the form of new health demands, that the respective Mesoamerican systems might face soon.

Figure VI.1
Mesoamerica: annual public expenditure on health, 2000-2016
(Percentages of GDP)
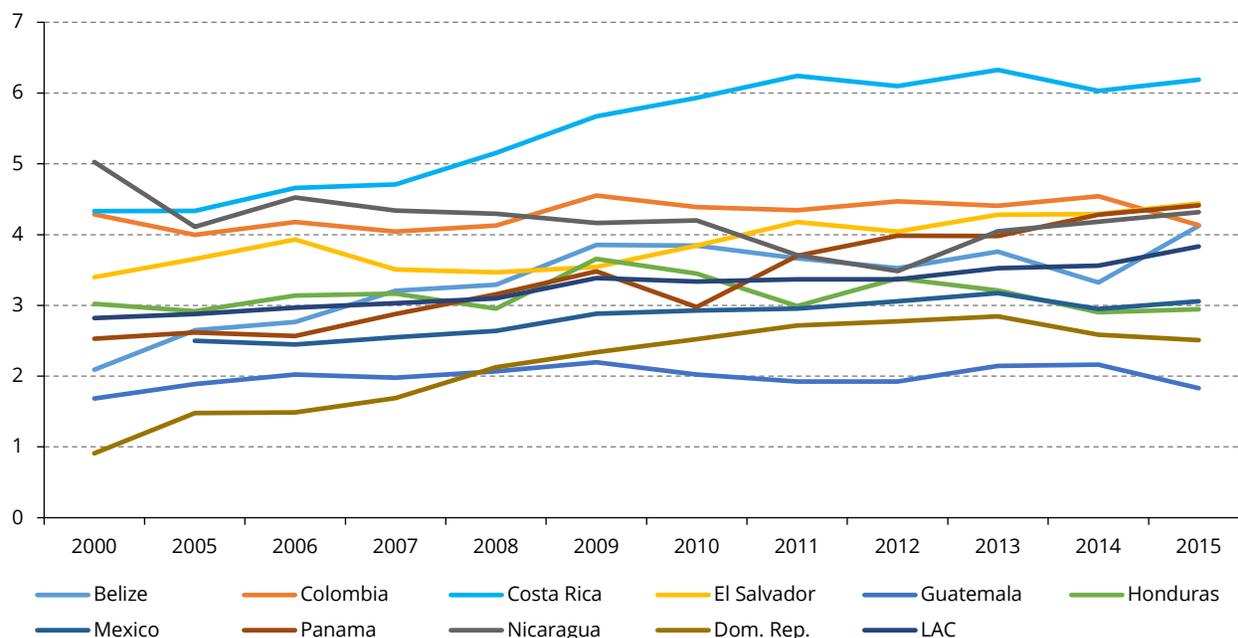
Source: World Bank, based on World Development Indicators [online database]
https://databank.bancomundial.org/data/source/world-development-indicators [date consulted: May 2019].

Figure VI.2
Mesoamerica: private spending on health, 2000-2016
(Percentages of current expenditure on health)
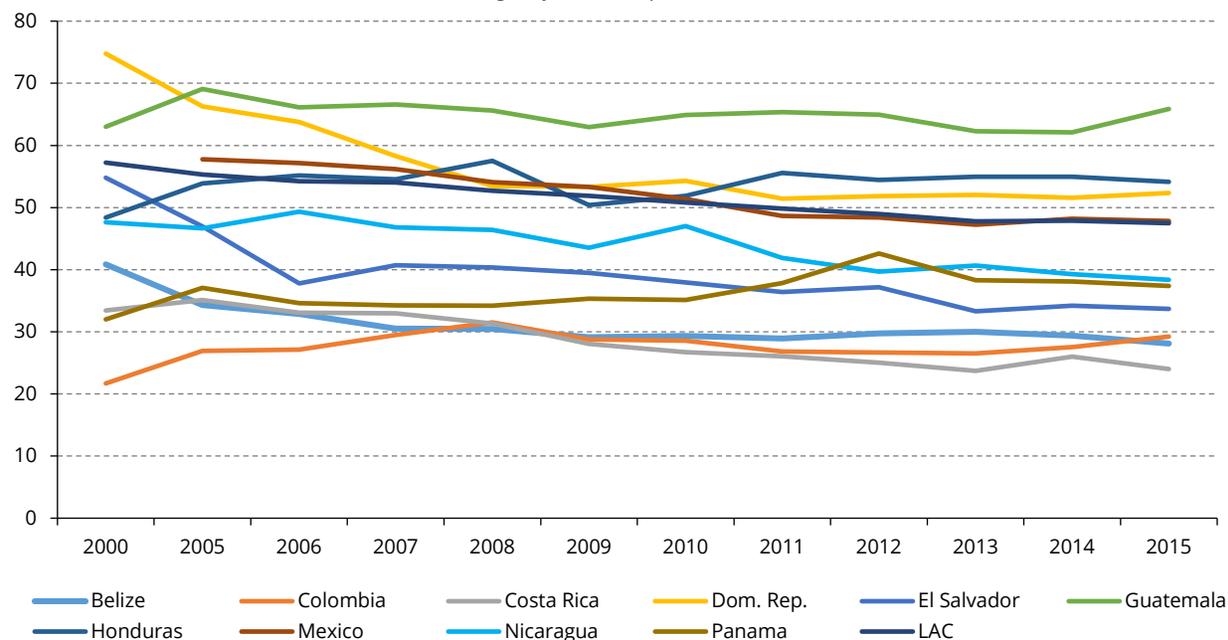
Source: World Bank, based on World Development Indicators [online database]
https://databank.bancomundial.org/data/source/world-development-indicators [date consulted: May 2019].

According to the World Health Organization's (WHO) global health estimations, most adult deaths in MP countries in 2016 were due to causes associated with cardiovascular diseases (25.8%), while malignant neoplasms and diabetes mellitus ranked second and third with 14.5% and 10.1% respectively (see figure VI.3).

Comparing these figures with global ones, while cardiovascular disease and malignant neoplasms are equally the first and second leading causes of death, diabetes mellitus, which is the third leading cause of death in the countries of Mesoamerica, falls to tenth place worldwide (see figure VI.4). This information is consistent with high rates of body mass (obesity) that occurs in a significant proportion of the population of the countries of Mesoamerica and is a high-risk factor precisely for cardiovascular diseases, diabetes mellitus and malignant tumours.

Figure VI.3
Mesoamerica: ten leading causes of death
(Percentages of total deaths)
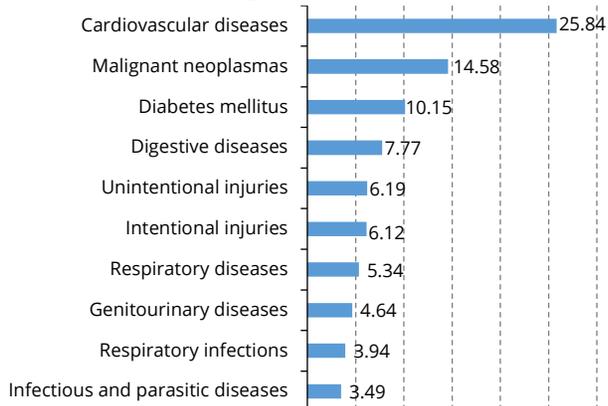
Cause	Percentage
Cardiovascular diseases	25.84
Malignant neoplasmas	14.58
Diabetes mellitus	10.15
Digestive diseases	7.77
Unintentional injuries	6.19
Intentional injuries	6.12
Respiratory diseases	5.34
Genitourinary diseases	4.64
Respiratory infections	3.94
Infectious and parasitic diseases	3.49

Source: World Health Organization (WHO), based on "Global Health Estimates" [online] https://www.who.int/gho/publications/world_health_statistics/en/, 2016.

Figure VI.4
World: ten leading causes of death
(Percentages of total deaths)
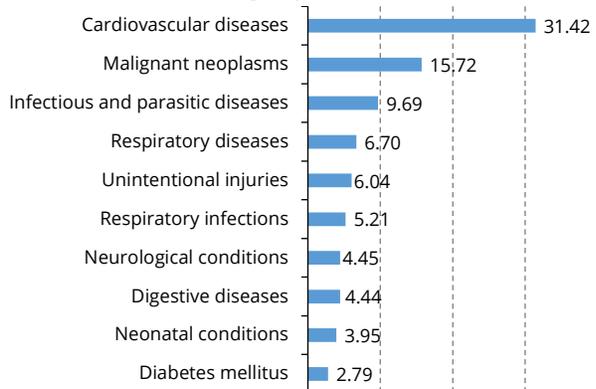
Cause	Percentage
Cardiovascular diseases	31.42
Malignant neoplasms	15.72
Infectious and parasitic diseases	9.69
Respiratory diseases	6.70
Unintentional injuries	6.04
Respiratory infections	5.21
Neurological conditions	4.45
Digestive diseases	4.44
Neonatal conditions	3.95
Diabetes mellitus	2.79

Source: World Health Organization (WHO), based on "Global Health Estimates" [online] https://www.who.int/gho/publications/world_health_statistics/en/, 2016.

The data presented reveal that the main causes of mortality in the Mesoamerican region are non-communicable diseases (NCDs). The increase in deaths caused by NCDs responds to a phenomenon of epidemiological transition that all countries are going through as they take effective measures against communicable diseases and increase the life expectancy and quality of life of their inhabitants.

The problems arising from NCDs are addressed through global programs working from various multilateral settings. In this regard, the MP offers a useful platform for regionally articulating the initiatives needed to address these issues. For example, the Mesoamerican Health Initiative managed by the IADB seeks to contribute to the fulfilment of Sustainable Development Objectives, especially access to health. The initiative contributed to improving access to quality health for 1.8 million women and children in Mesoamerican countries and includes a Regional Initiative for the Elimination of Malaria.

The progress level in the effectiveness of health systems can be seen in the indicators of maternal mortality and under-5-year-old children mortality. In both cases, there has been a substantial improvement in all the MP countries (see tables VI.2 and VI.3). However, it was not possible to achieve the Millennium Development Goals in a generalized manner, and in some countries a high number can still be observed in both indicators.

Table VI.2
Mesoamerica: maternal deaths, 2000, 2005 y 2015
(Maternal deaths per 100,000 live births)

Country	2000	2005	2015
Belize	53	52	28
Colombia	97	80	64
Costa Rica	38	31	25
Dominican Republic	79	64	92
El Salvador	84	68	54
Guatemala	178	120	88
Honduras	133	150	129
Mexico	77	54	38
Nicaragua	202	190	150
Panama	82	87	94
América Latina y el Caribe	99	88	67

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html [date of reference: January 2019].

Table VI.3
Mesoamerica: under-five mortality rate, 2000, 2005 and 2016
(Deaths per 100,000 live births)

Country	2000	2005	2016
Belize	24.1	21.0	14.9
Colombia	25.0	21.6	15.3
Costa Rica	12.9	10.5	8.8
Dominican Republic	41.0	36.8	30.7
El Salvador	32.5	24.7	15.0
Guatemala	51.9	42.7	28.5
Honduras	37.3	29.4	18.7
Mexico	26.8	20.6	14.6
Nicaragua	40.4	31.4	19.7
Panama	26.0	22.8	16.4
América Latina y el Caribe	33.4	26.2	17.5

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html [date of reference: January 2019].

VII. Food security and nutrition

Sustainable Development Goal (SDG) 2 seeks to end hunger. Its goals are to ensure access for all people, particularly the poor and those in vulnerable situations. In addition, to end all forms of malnutrition, and to address the nutritional needs of adolescents, pregnant and lactating women, and the elderly. It also seeks to promote sustainable agriculture and resilient agricultural practices.

Significant progress has been made in reducing undernutrition in the sub-region conformed by the countries of the Mesoamerica Integration and Development Project. The latest FAO estimations show that the proportion of undernourished people has decreased in most countries. However, there are significant differences. Great progress has been made in Panama and the Dominican Republic, where malnutrition levels have decreased significantly. However, in Guatemala, Honduras and Nicaragua undernourishment persists in more than 15% of the population. Likewise, in El Salvador the percentage has increased slightly.

Changes in the percentage may seem insignificant from a historical perspective, considering the continued growth of the population, but it implies that the number of hungry people has increased in recent years (see table VII.1). In 2017, FAO estimates that the absolute number of undernourished people in the region is about 14.3 million (FAO and others, 2018).

Table VII.1
Mesoamerica: prevalence of undernourishment, 2000-2017
(Percentages)

Country	2000-2002	2005-2007	2010-2012	2015-2017
Belize	5.0	4.9	5.8	6.5
Colombia	9.4	9.6	10.9	6.5
Costa Rica	5.3	5.1	5.2	4.4
Dominican Republic	27.1	21.9	14.6	10.4
El Salvador	9.3	10.8	12.5	10.3
Guatemala	18.1	15.8	15.8	15.8
Honduras	18.5	16.3	15.2	15.3
Mexico	4.4	5.0	4.6	3.8
Nicaragua	29.3	23.4	20.0	16.2
Panama	26.2	21	11.8	9.2

Source: Food and Agriculture Organization of the United Nations (FAO), 2019.

Simultaneously with the reduction in malnutrition, a significant increase in overweight and obesity has been observed in adults and children. Both problems of overweight and underweight (the double burden of malnutrition) coexist in the same communities and even in families.

Over the past few decades, development and health policies that address nutritional problems have been largely oriented towards reducing malnutrition. However, along with prevalent micronutrient deficiencies, rapid increases in overweight and chronic diseases are becoming a compelling problem in a changing regional context of high geographic mobility, urbanization and nutritional transition (Fernández and others, 2017).

Most recent estimations of the prevalence of obesity in the adult population over 18 are between 19% and 26% and between 27% and 34% among women over 18 (WHO, 2019) (see Figure VII.1). Obesity contributes to a higher incidence of disease, increasing costs and losses to families and to health and productive systems.

Figure VII.1
Mesoamerica: double burden of malnutrition, 2016
(Percentages)
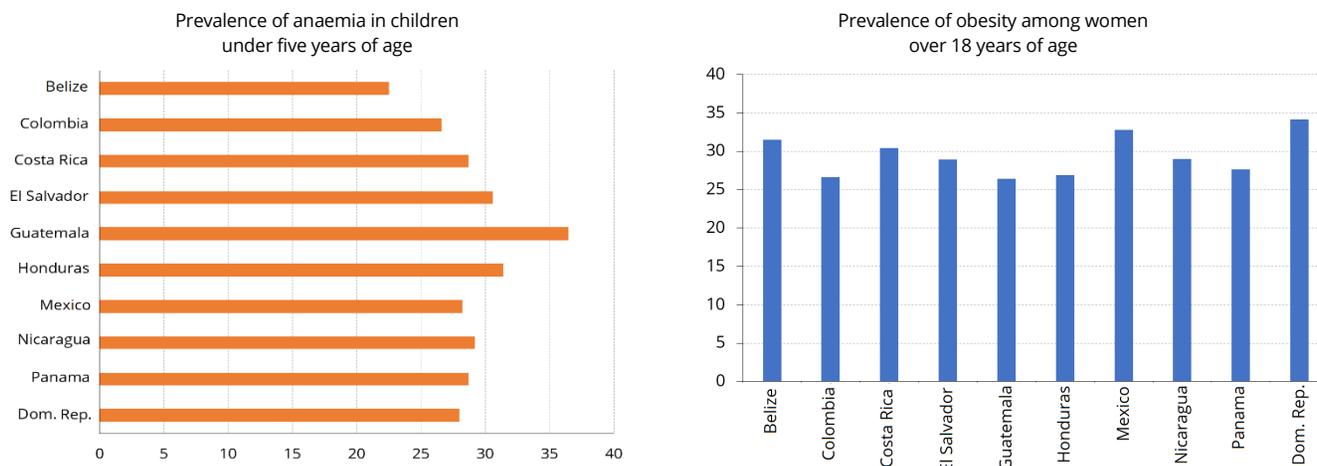
Source: World Health Organisation (WHO), 2019.

A food system should be able to provide the population with nutritious and sustainable diets, generate minimal environmental impact, protect ecosystems and the ability of future generations to meet their needs (intergenerational equity), and create decent livelihoods and incomes for the people who work in that system.

Most Mesoamerican countries have inherited a food system centred on the corn-bean pair and complemented by other crops that meet basic human nutritional requirements and generate minimal environmental impact. Currently, the three basic grains - corn, beans and rice - constitute the basis of the region's diet: they provide between 20% and 25% of the caloric supply of total food in Belize, Colombia, Costa Rica and the Dominican Republic; between 30% and 37% in El Salvador, Honduras, Mexico and Panama; 40% in Guatemala; and 47% in Nicaragua. In terms of protein supply, these basic grains provide between 20% and 26% in Belize, Colombia, Costa Rica, Panama and the Dominican Republic; 37% in Mexico; between 41% and 47% in El Salvador, Honduras and Guatemala; and 54% in Nicaragua (FAO, 2019).

Between 2000 and 2017, there was an increase in perceived consumption of these crops, especially in the case of corn, which grew at an average annual rate of 4%. Apparent consumption of beans and rice increased at an average annual rate of 2%. During the same period, the corn dependency ratio increased. Most of these imports are of yellow corn destined for livestock consumption or industry. The degree of dependence on rice and beans also increased (CEPALSTAT, 2019) (see figure VII.2).

Central America has a regional food and nutritional security policy that seeks to help the population to have access to, consume and use food in a permanent and appropriate manner, in sufficient quantity and with the variety, quality and safety necessary to meet their food needs and preferences, in order to lead to an active and healthy life. The implementation of this policy covers the period from 2012 to 2032. Meanwhile, the agricultural sector has established the Climate-Adjusted Sustainable Agriculture Strategy for SICA: 2018-2030, which directly links agricultural development with food and nutritional security and climate change.

Figure VII.2
Mesoamerica: dependency rate of basic grains, 2000 and 2017
(Percentages)
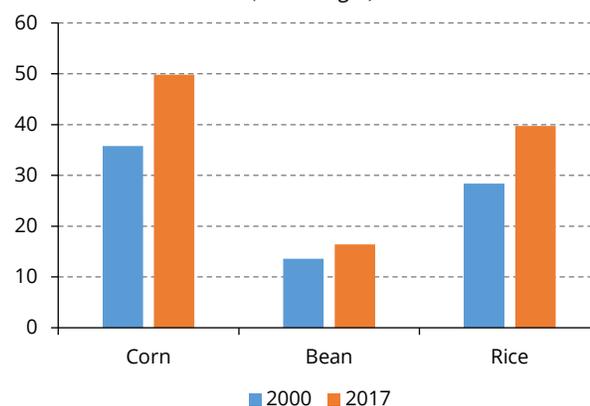
Source: CEPALSTAT, 2019.

The region also has the «Mesoamerica without Hunger» (MSH) initiative, which is a South-South triangular cooperation of the Government of Mexico to strengthen food and nutritional security actions in Belize, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama and the Dominican Republic. The actions of the MSH initiative are based on a Framework Cooperation Agreement signed between the Government of Mexico and FAO.

VIII. Environment, disaster risk management and climate change

A. Biodiversity and deforestation

The sub-region formed by the MP countries has been characterized by the gradual loss of its forest area. As shown in table VIII.1, forest area in Mexico, Central America, the Dominican Republic and Colombia amounted to 160 million hectares in 1990, fell to 152 million hectares in 2000 and fell back to 147 million hectares in 2016.

Forests and biodiversity are a fundamental asset of indisputable economic value, contributing to human well-being through different environmental goods and services used in production, distribution and consumption processes. The trend towards deforestation is almost generalized in the Mesoamerican subregion, except for Costa Rica.

Table VIII.1
Mesoamerica: forest area, 1990, 2000, 2005, 2010 and 2016

(Thousands of hectares)

Country	1990	2000	2005	2010	2016
Belize	1 576	1 489	1 441	1 393	1 361
Colombia	62 418	61 509	61 004	60 499	58 475
Costa Rica	2 545	2 376	2 491	2 605	2 786
Dominican Republic	1 972	1 972	1 972	1 972	2 016
El Salvador	373	332	309	287	261
Guatemala	4 694	4 208	3 938	3 657	3 504
Honduras	7 962	6 392	5 792	5 192	4 472
Mexico	69 937	66 751	65 578	64 802	65 948
Nicaragua	4 444	3 814	3 464	3 114	3 114
Panama	3 792	3 369	3 310	3 251	4 601
Total	159 713	152 212	149 299	146 772	146 538

Source: Food and Agriculture Organization of the United Nations (FAO), based on FAOSTAT [online database] http://www.fao.org/faostat/es/#home, 2018.

Land use is one of the most relevant issues in environmental policy and the estimation of impacts in climate change scenarios. Considering the studies on the economics of climate change for Central America (ECLAC and others, 2010; ECLAC, 2012) and trends on land use change, losses in forest cover of approximately 30% are expected. In addition, grasslands, savannas and shrubs would shrink by about 80%, while the area devoted to agricultural work would increase by 50% (see map VIII.1).

Map VIII.1
Central America: land use change scenario, 2005 (baseline) 2100 (trend)

A. Base scenario 2005

B. BAUª scenario, 2100
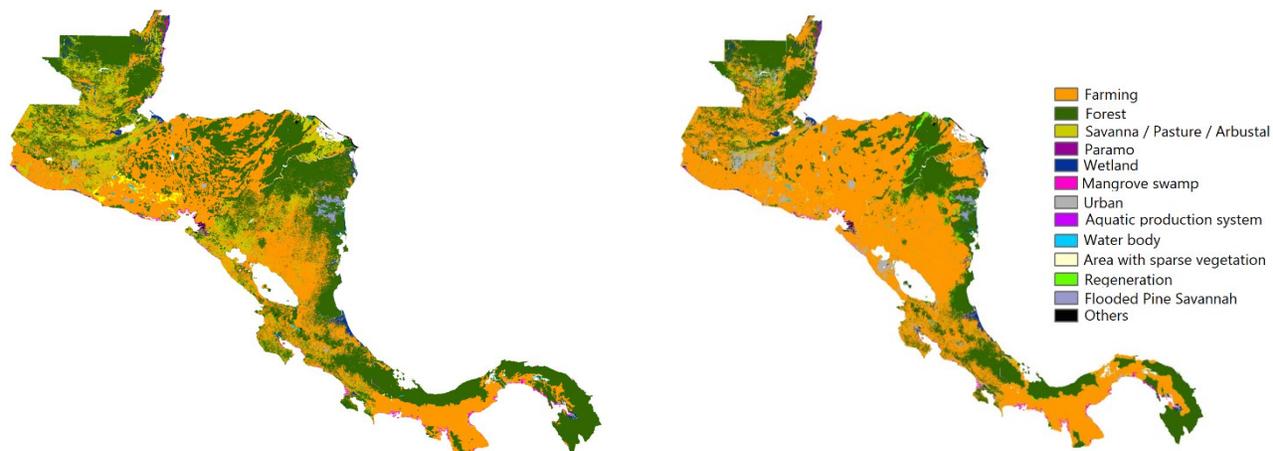
Legend:
- Farming
- Forest
- Savanna / Pasture / Arbustal
- Paramo
- Wetland
- Mangrove swamp
- Urban
- Aquatic production system
- Water body
- Area with sparse vegetation
- Regeneration
- Flooded Pine Savannah
- Others

Source: Economic Commission for Latin America and the Caribbean (ECLAC) and others, The economics of climate change in Central America: technical report 2011 (LC/MEX/L.1016), Mexico City, 2011a.
ª BAU: assumes that development follows past trends and there are no changes in public policies that affect them.

In the case of Mexico, the analysis was performed by estimating a transition probability matrix constructed with the 1976 and 2000 inventories with their respective conversion rates. From the results, it is concluded that grasslands and croplands have advanced and are the main cause of tree cover reduction, which contributes to plant degradation, desertification and biodiversity loss (see figure VIII.1).

Figure VIII.1
Mexico: projection of base coverage in the transition observed between 1976-2096
(Millions of ha)
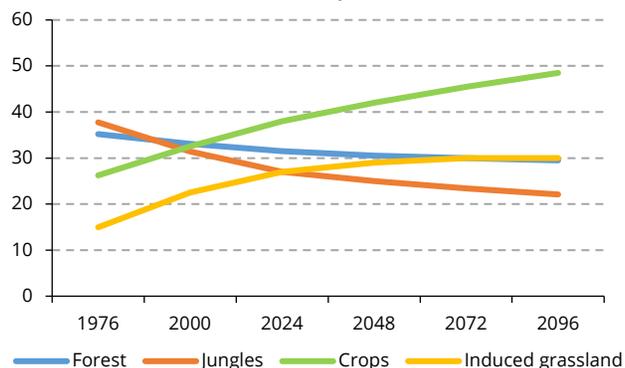
Source: Luis Miguel Galindo (coord.), *The economics of climate change: synthesis, Federal Government, Ministry of Finance and Public Credit (SHCP)*, Ministry of Environment and Natural Resources (SEMARNAT), Mexico, 2009.

In addition to its intrinsic value, biodiversity is an asset that provides different ecosystem goods and services to humanity. Despite having around 1% of the world's surface, Central America represents 7% of the world's biodiversity (INBio, 2004). For example, Guatemala has 14 terrestrial ecoregions with different ecosystems, more than 200 fluvial and terrestrial ecological systems and around 15,000 different species of flora and 100,000 of fauna (MARN, 2009). Costa Rica, in turn, has 94,753 known species, 5% of the biodiversity known in the world and has a system of protected areas that covers about 26% of its land area and 3% of its coastal-marine jurisdiction (SINAC, 2017). In addition, these two countries, as well as Colombia and Mexico, are part of the Group of Related Megadiverse Countries (GPMA)[3].

Forecasts of the impact of climate change on the potential biodiversity index (PIB) pinpoint the high vulnerability of Central America's biodiversity indicators to climate change. The baseline scenario estimates a reduction in the region's biodiversity potential with respect to the 2005 PIB, from 9% to 2030 and from 13% to 2100 (see map VIII.2).

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[3] The GMPA cooperation mechanism consists of 12 of the megadiverse countries (Australia, Brazil, China, Colombia, Ecuador, India, Indonesia, Madagascar, Malaysia, Mexico, Papua New Guinea, Peru, the United States, Venezuela (Bolivarian Republic of), the Congo and South Africa) plus five biodiversity-rich countries (Costa Rica, Guatemala, the Philippines, Iran (Islamic Republic of) and Kenya).

Map VIII.2
Central America: evolution of the potential biodiversity index, 2005,
base and climate change scenarios (B2 and A2) in 2100
(Five-level scale with dark blue representing a larger IBP)
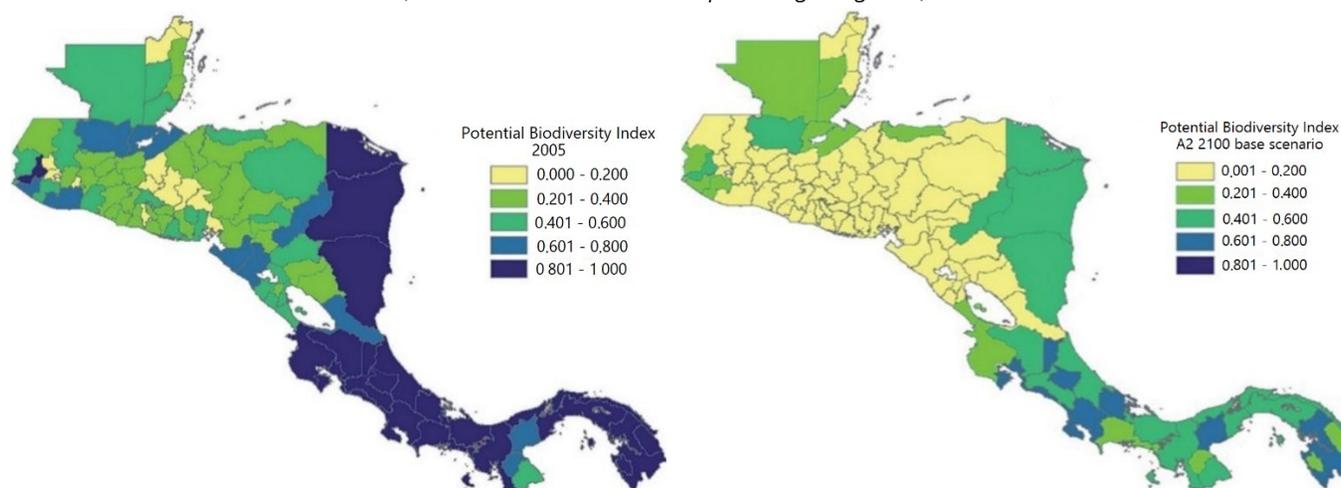
Potential Biodiversity Index
2005

- 0.000 - 0.200
- 0.201 - 0.400
- 0.401 - 0.600
- 0.601 - 0.800
- 0 801 - 1 000

Potential Biodiversity Index
A2 2100 base scenario

- 0,001 - 0,200
- 0,201 - 0.400
- 0,401 - 0,600
- 0,601 - 0,800
- 0.801 - 1.000

Source: Economic Commission for Latin America and the Caribbean (ECLAC) and others, The economics of climate change in Central America: Summary 2010 (LC/MEX/L.978), Mexico City, 2010.

Considering scenario A2[4] (temperature increase between 0.8 °C and 1.0 °C in 2030 and between 3.6 °C and 4.7 °C in 2100 with respect to the period 1980-2000), the PIB would decrease by 21% in 2030 and 58% in 2100 with respect to 2005. The most affected countries would be El Salvador, Guatemala, Honduras and Nicaragua, with contractions between 34% and 28% of the PPI in 2030 and between 75% and 70% in 2100 in scenario A2 (ECLAC and others, 2011).

Mexico and Colombia own almost 70% of the amount and diversity of animals and plants in the world. Mexico accounts for 8.5% of global biodiversity (Galindo, 2009).

Analyses of the impacts of climate change on biodiversity in Mexico shows that the estimated loss of biodiversity is significant and increasing over time, which in turn will have a negative impact on agricultural production (see figure VIII.2).

Colombia has the highest concentration of flora and fauna per square kilometre in the world; it is estimated that, with only 1% of the planet's surface, it concentrates 10% of its biodiversity. In the 3,000 km of coastline in the two oceans there are all the marine ecosystems of the tropics. 68.8% of the territory is composed of natural ecosystems, and the transformed

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[4]   The characterization of scenario A2 poses a very heterogeneous, self-sufficient and conservation world of local entities, with an economic development oriented to the regions, while the economic growth per inhabitant, as well as the technological change, are more fragmented and slower than in other evolutionary lines (IPCC, 2000).

areas represent only 31.1% of the territory. Transformations of natural ecosystems result from the expansion of the agricultural border, the growth of urban and rural settlements, deforestation, overexploitation of natural resources and pollution (ECLAC, 2013).

Figure VIII.2
Mexico: biodiversity index forecast under different climate change scenarios, 2006-2099
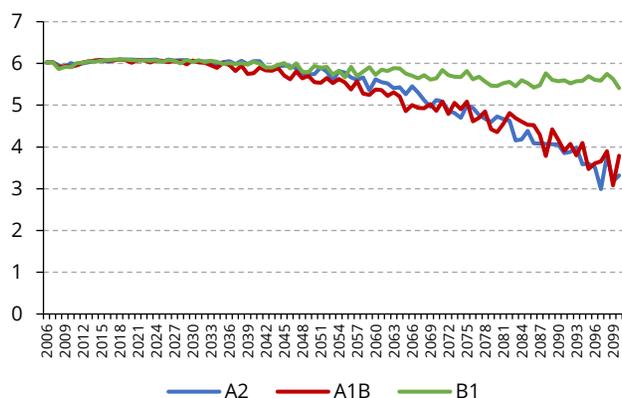
Source: Luis Miguel Galindo (coord.), The economics of climate change: synthesis, Federal Government, Ministry of Finance and Public Credit (SHCP), Ministry of Environment and Natural Resources (SEMARNAT), Mexico, 2009.

Central America has a great diversity of ecosystems, including its tropical forests. In 2005, these covered approximately 45% of the region's territory and contained about 7% of the planet's biodiversity. Estimations of the potential impacts of climate change on ecosystems using the Holdridge Life Zones (HLZ) indicate that in scenario A2 eight tropical humid forest types would reduce their extent, while four tropical dry forest types would increase from 11% to 39%. These two HLZs would represent almost 84% of the total natural area.

The economic appraisal of four types of ecosystem services (provision, regulation, support and cultural) of the tropical forests of Central America combining the land use change scenarios (LUC) and the A2 scenario to the 2050 and 2100 cuts indicates reductions of 11% and 29%, respectively, of the estimated annual value of ecosystem services of the HLZs relative to the LUC scenario. In this scenario, the drop-in appraisal is related to the reduction in the area of rainforests that have a higher value per hectare.

Figure VIII.3
Central America: surface of life zones of Holdridge, 2005 and stage A2 with cuts at 2100
(Millions of ha)
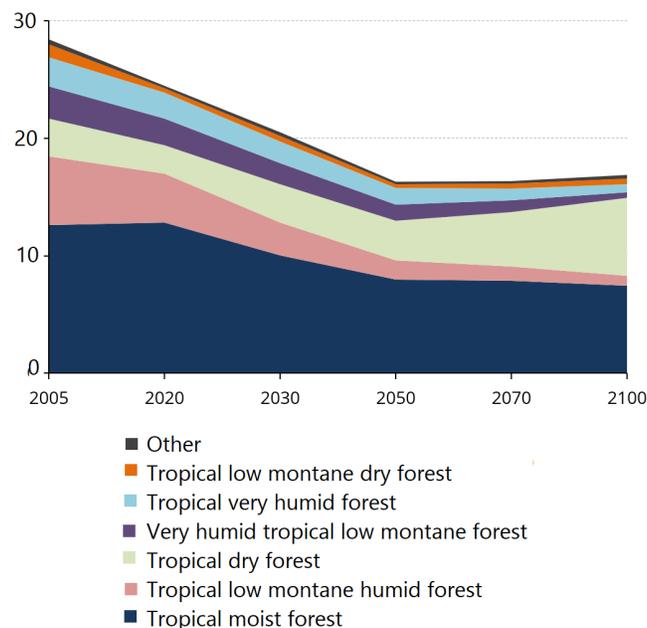
Source: Economic Commission for Latin America and the Caribbean (ECLAC) and others, Climate Change in Central America: Potential Impacts and Public Policy Options (LC/MEX/L.1196), Mexico City, 2015.

The available evidence indicates that the influence of human activities on ecosystems is significant because they modify their availability, structure and systemic behaviours (MEA, 2005). Along with their plant and animal reserves, the world's forests are threatened like never before, which has negative economic, social and environmental impacts.

However, there are some mechanisms such as payments for environmental services (PES) that can act as an economic solution to restrict the negative effects on natural resources by economically value its utility. In all countries of the sub-region there are already different PES experiences, mainly in water services, carbon absorption and REDD.

B. Greenhouse gas emissions

Mesoamerica, and Central America in particular, is not characterized as a large emitter of greenhouse gases (GHG). It is estimated that Central America produces less than 0.3% of global emissions without land use change and less than 0.8% of total gross emissions (ECLAC, 2011). However, it suffers severely from the consequences and impacts of climate change, given that climate is decisive for activities such as agriculture and hydropower generation, as well as for their inhabitants and ecosystems.

Worldwide, annual GHG emissions are estimated at 50 gigatons[5]. The global average per capita GHG emissions are seven tons. The Intergovernmental Panel on Climate Change (IPCC) predicts that to keep the

temperature rise below 2 °C by the middle of the 21st century, per capita emissions must fall to two tons.

As for the Mesoamerican region, until 2010 GHG emissions from changes in use of land - net of disposals - were estimated at 221 million tons (see table VIII.2), which have been drastically reduced to 56 million tons in 2016 as a result of reduced deforestation, particularly in Colombia and Nicaragua. This has resulted in decreases of approximately 12 percentage points per year. On the other hand, GG emissions from agriculture amounted to 183 million tons in 2016, equivalent to an average annual increase of 0.3% (see tables VIII.2 and VIII.3).

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[5]   One gigaton is equivalent to one billion tons.

Table VIII.2

Mesoamerica: greenhouse gas emissions from land use change
(net of takeovers), 1990, 2000, 2005, 2010 and 2016

(Millions of tons)

Country	1990	2000	2005	2010	2016
Belize	6.67	11.66	8.27	7.89	3.36
Colombia	147.76	150.32	167.68	161.05	40.50
Costa Rica	6.43	9.66	-7.45	-7.37	-10.95
Dominican Republic	-9.98	-9.94	-8.42	-8.71	-8.73
El Salvador	0.88	0.89	0.88	0.84	0.73
Guatemala	16.85	21.77	18.75	16.72	9.12
Honduras	1.02	3.63	2.63	0.60	1.60
Mexico	20.82	99.33	22.54	12.87	11.04
Nicaragua	29.38	30.42	30.28	29.55	1.33
Panama	8.74	8.78	8.97	8.20	8.35
Total	228.58	326.52	244.13	221.63	56.37

Source: Food and Agriculture Organization of the United Nations (FAO), based on FAOSTAT [online database] http://www.fao.org/faostat/es/#home.
Note: Most countries include emissions from forest land, cropland, grassland and biomass burning, except for El Salvador, Guatemala, Honduras and Mexico which only include forest land and biomass burning.

Table VIII.3

Mesoamerica: greenhouse gas emissions from agriculture,
1970, 1980, 1990, 2000, 2010 and-2016

(Millions of tons)

Country	1970	1980	1990	2000	2010	2016
Belize	0.1	0.1	0.2	0.2	0.3	0.4
Colombia	38.4	46.9	51.8	53.0	59.2	51.2
Costa Rica	3.0	4.3	4.4	3.2	3.3	3.6
Dominican Republic	3.0	4.8	5.4	5.3	7.9	8.0
El Salvador	2.7	2.7	2.8	2.5	3.0	2.4
Guatemala	3.3	4.4	4.8	6.0	8.0	9.2
Honduras	3.3	4.0	4.8	4.5	5.5	5.9
Mexico	56.3	70.3	81.4	79.4	83.1	89.5
Nicaragua	4.7	4.5	6.1	6.5	7.5	9.8
Panama	2.3	2.7	2.9	2.8	3.4	3.2
Total	117.1	144.4	164.9	167.0	180.5	183.2

Source: Food and Agriculture Organization of the United Nations (FAO), based on FAOSTAT [online database] http://www.fao.org/faostat/es/#home.

In Central America, changes in the use of land have had a significant impact on GHG emissions. As can be seen in figure VIII.4, 75% of emissions in 2000 were due to deforestation. Among the productive activities, the emissions generated by agriculture and livestock stand out with 12% of the total, followed by transport activity

with 5% and waste along with residential and services, 2% each.

The projections for 2030 attribute less emissions to deforestation (25%), equivalent to a decrease of 247 million tons to 78 million tons of CO_2. There would be a significant increase in emissions from agricultural and livestock activities (31%), from 42 million to 96 million tons of CO_2. Finally, emissions from transport (16%) and electricity (13% of the total) would be relevant).

Figure VIII.4
Central America: sectoral structure of estimated GHG emissions with land-use change, 2000 and 2030
(Percentages)
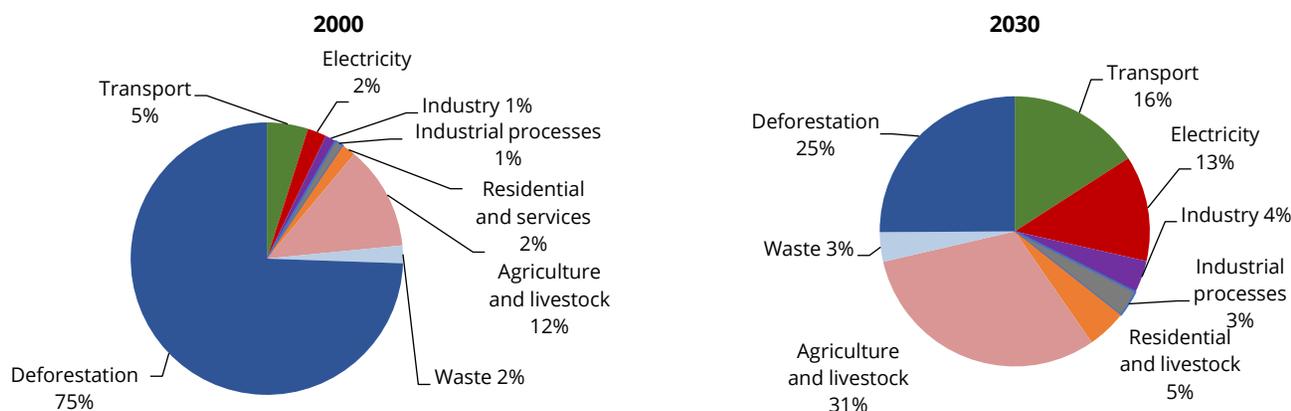
Source: Economic Commission for Latin America and the Caribbean (ECLAC) and others, The Economics of Climate Change in Central America: Technical Report, 2011a.

C. Scenarios in temperature, precipitation and aridity with climate change

Climate variability will also change in the future. If emissions continue their current trajectory, it is likely that the rainfall regime in the Central American subregion will be significantly affected. In the dry months of the year, an increase in aridity levels in the subregion is expected. The historical aridity index for the Central American subregion averages 1.6 for the period 1950-2000, if it is classified as wet.

In climate change scenario A2 the aridity index would drop to 1.4 in 2030 with 30 departments in sub humid-humid conditions and to 1.2 in 2100, falling into sub humid-humid ranges as a regional average (see map VIII.3). The performance of basic grains in the well-known Central American Dry Corridor would be adversely affected and the food and nutritional insecurity of the populations would increase.

Map VIII.3
Central America: historical aridity index and with climate change, scenario A2, 1950-2000, 2100 and 2030

A. 1950-2000

B. 2030

C. 2100

	0.90-1.25		1.25-1.60		1.60-1.95		1.95-2.30		2.30-2.65		2.65-3.00

Subhumid-Humid   Humid

Note: The limits and names shown on these maps do not imply official endorsement or acceptance by the United Nations.

In Mexico, analyses and projections confirm the presence of a gradual increase in temperature and a more oscillating behaviour in precipitation patterns (Galindo, 2009). These studies indicate that in scenario A2 of map 6, the change in mean temperature is projected between 2.5 °C and 4 °C, with a range of variation from 1 °C to 2.5 °C, depending on the region, with north western Mexico showing greater increases. In this scenario, the average annual precipitation could decrease for the whole country by 11%, with a range of spatial variation in the assembly from -5.7% to -17.8% (see map VIII.4).

In Central America, in scenario A2, temperature increases of between 3.6 °C and 4.7 °C are estimated for the end of the century, with marked variations in temperature within the region.

Under scenario A2, it is estimated that in the coming decades the bimodal precipitation pattern could change. There would be increases in both periods of high rainfall and decreases during the heat wave by 2030. Subsequently, rainfall in the first period would be gradually reduced, leaving a single annual peak between October and November (see figure VIII.5). The exceptions would be Costa Rica and Panama, which could experience an increase in rainfall at the beginning of the season over the next few decades and then a reduction to a level close to historical, resulting in a relatively stable pattern from June to November.

Map VIII.4
Mexico: projected changes in mean temperature and annual precipitation in scenario A2 (colour shading) and scatter between models (solid lines), 2100
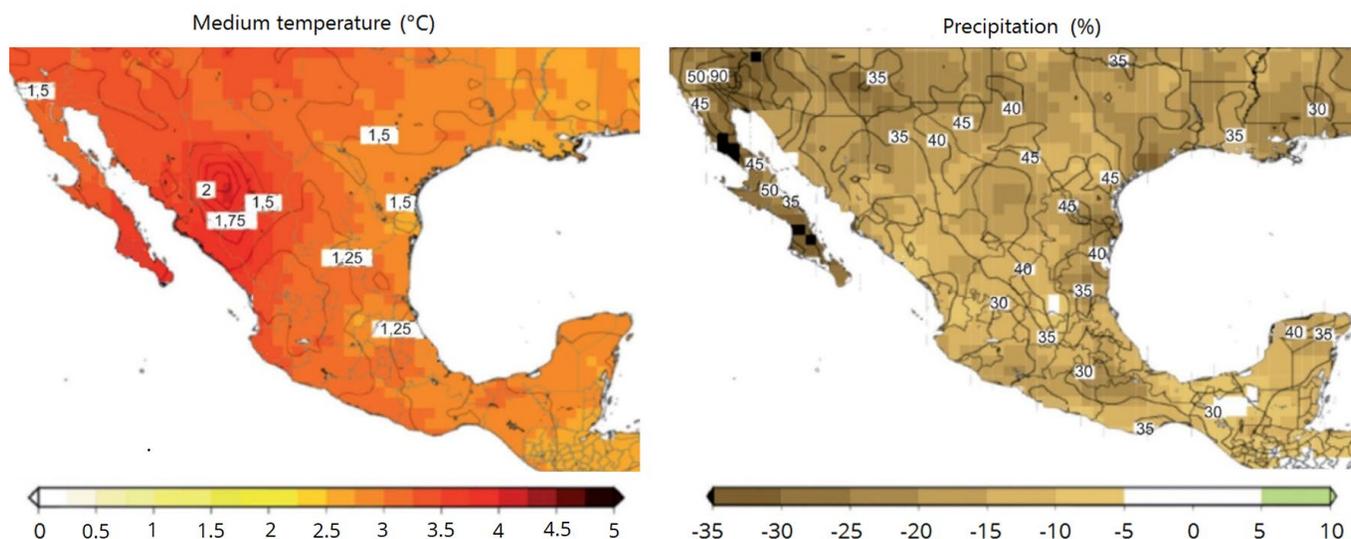
Source: Luis Miguel Galindo (coord.), The economics of climate change: synthesis, Federal Government, Ministry of Finance and Public Credit (SHCP), Ministry of Environment and Natural Resources (SEMARNAT), Mexico, 2009.

Map VIII.5
**Central America: average annual temperature (°C) per department 1950-2000 average
and A2 scenario with cuts to 2100, 1950-2000, 2020, 2050 and 2100**

A. 1950–2000 Average

B. 2020
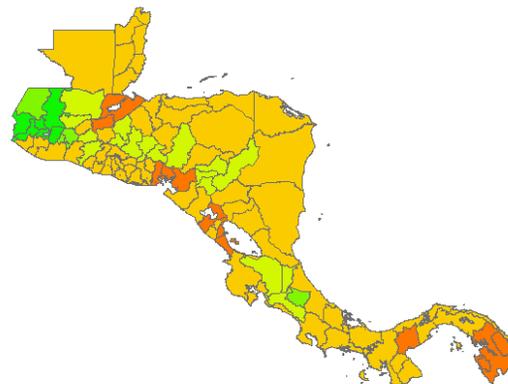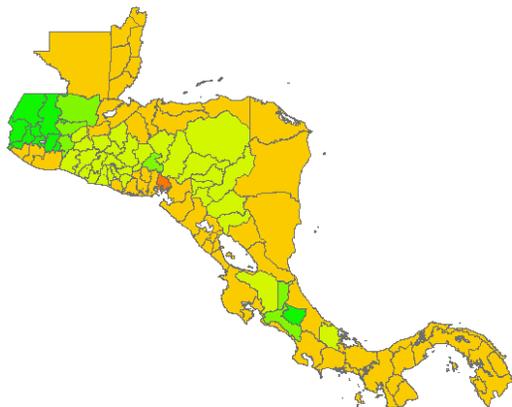
C. 2050

D. 2100
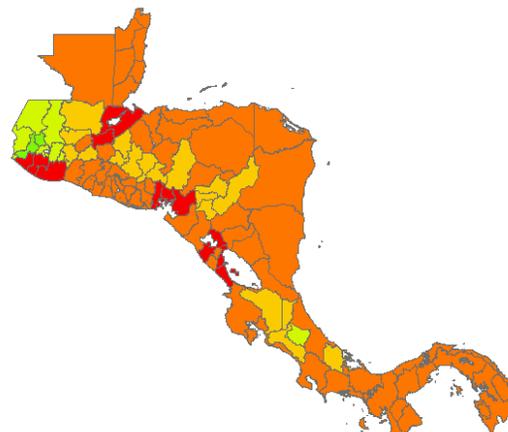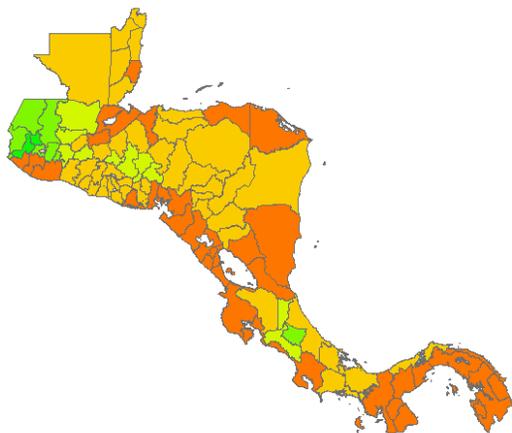
15 - 18	18 - 21	21 - 24	24 - 27	27 - 30	30 - 33

Source: Economic Commission for Latin America and the Caribbean (ECLAC) and others, The Economics of Climate Change in Central America: Potential Impacts on Intra-Annual and Spatial Climate Patterns. Technical Series 2012 (LC/MEX/L.1073), Mexico City, 2012b.

Figure VIII.5
**Central America: monthly precipitation, average
1980-2000 and scenario A2 with cuts at 2100**
(Millimetres)
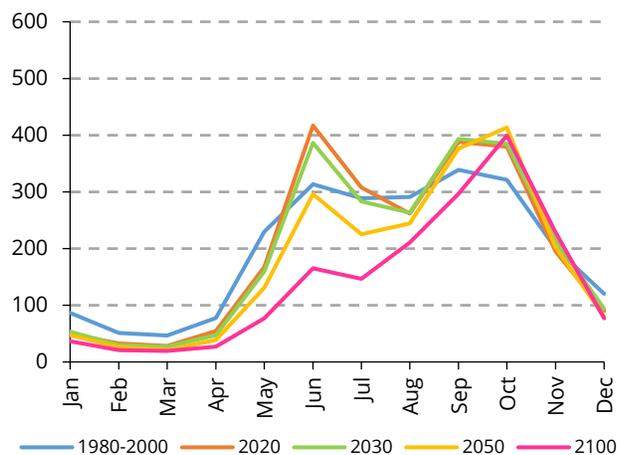
Source: Economic Commission for Latin America and the Caribbean (ECLAC) and others, The Economics of Climate Change in Central America: Potential Impacts on Intra-Annual and Spatial Climate Patterns. Technical Series 2012 (LC/MEX/L.1073), Mexico City, 2012b.

In Colombia, work performed by the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) shows that the average air temperature in the country would increase by 1.4 °C between 2011 and 2040; 2.4 °C between 2041 and 2070, and 3.2 °C between 2071 and 2100. Using the most emission-intensive scenarios (A2 families), IDEAM has estimated that Colombia will face significant reductions in precipitation, especially in the Andean and Caribbean regions (IDEAM, 2010).

Changes in rainfall and humidity would be more significant in the Caribbean region, as it would cease its current conditions of a semi-humid climate and move to a semi-arid climate, to be classified as arid at the end of the 21st century. In the Andean region, the most significant changes are predicted by a transition from semi-humid to semi-arid climate.

Thus, based on the scenario of rainfall and temperature (2071 to 2100) and the consequential estimation (water balance) from the results of the PRECIS model, IDEAM calculates that there would be reductions of around 30% of the average runoff in the basins of the Upper and Lower Magdalena, Cauca, part of the Caribbean Coast, Saldaña, César and Bogotá (ECLAC, 2013, based on IDEAM, 2010).

The preliminary calculation of the accumulated measurable cost of climate change in Central America for 2100 in scenario A2, based on impacts on the agricultural sector, water resources, biodiversity, hurricanes, storms and floods, is equivalent to 73 billion current dollars or 52 billion dollars at 2002 prices.

This figure is approximately 54% of regional GDP in 2008 at net present value at a discount rate of 0.5% (with a discount rate of 4% the equivalent value is 9% of regional GDP in 2008 to net). The greatest increase in costs would occur in the second half of the century, when the effects of emissions would be greatest in a scenario of inaction.

In Colombia, it has been estimated that the impact of climate change in four subsectors reduces growth in the following proportions: 23.7% (agriculture); 16.8% (fishing); 15.8% (livestock) and 4.6% (forestry) compared to its trend production. The cost of the impact of climate change on the agricultural sector means that in the trend scenario there will be an average GDP growth of close to 2.3% in the period 2000-2100.

The impact of climate change on agricultural sub-sectors will produce a potential GDP percentage difference of 2.6% lower during the simulation period. For the manufactured food sector, climate change would generate a 16.15% reduction in production compared to the baseline scenario. This implies an average decrease of 0.057 percentage points in GDP growth (ECLAC, 2013).

In order to estimate the impact of climate change on natural ecosystems, models of the potential distribution of some of Colombia's most representative ecosystems (Andean forest, humid forest, dry forest, moorland and savannahs) indicate that, in an IPCC (A2) worst-case climate change scenario, savanna and moorland ecosystems would be the most impacted by decreasing their coverage by 70% and 60%, respectively, by 2050.

Meanwhile, Andean forests and dry forests would also shrink their cover by 40% and 20%, respectively, while humid forests could expand it by up to 50% from the baseline scenario by 2050. In 2080, the reduction would be maintained for moors and savannahs, while for dry forest coverage could be recovered to reach an increase of 40% compared to the base scenario (ECLAC, 2013).

This study, The Economics of Climate Change in Mexico (2009), made a preliminary calculation of the costs of the impact of climate change on agriculture, water resources, land use, biodiversity and tourism. Costs are heterogeneous, not lineal and increasing over time. A slight increase in temperature may be beneficial in some regions of the country; however, the continuous rising of temperature has increasing negative effects on economic activities.

Accumulated costs up to 2100 with a discount rate of 0.5% in scenario A2 could represent 31% of 2000 GDP. In addition, the risks of very high damage associated with extreme events increase over time. The result presented shows that costs for impacts are higher than mitigation costs (Galindo, 2009).

D. Drought

In Central America, drought is not associated with extended periods without rain (one or two years), but with factors such as the lengthening of the summer or heat wave, the distribution of rainfall during the rainy season in few rainy events between long periods of dry days, the increase in air temperature, which depending on when it happens or for how long it is kept, will also affect crop development and the early end of the rainy season (Bonilla, 2014.).

The most commonly affected areas are the Central American Dry Corridor and the Arco Seco, located in Panama. Both zones frequently report water deficit conditions due to a drought of variable duration, often related to the El Niño phenomenon (Bonilla, 2014). According to Bonilla (2014), drought can be much more damaging in the small Central American properties in the Pacific area dedicated to smaller volume production for self-consumption and small-scale trade. This type of activity takes place in local economies that may involve bartering and conventional trade but are very significant in terms of the number of families dependent on them. It is common that these types of productive units have less technical and economic resources to respond and adjust to a reduction in rainfall that may prolong the dry season or modify the known patterns of the rainy season.

The most drought-affected crops in Central America include corn and beans. The losses mainly affect homes of small producers of basic grains, especially in Honduras and Guatemala, where the crop is used for self-consumption (GWP, 2014). Thus, the most recent drought in Central America, which struck on August 2014, caused important damages to the agricultural sector that according to FEWS NET (2014) included losses in corn of approximately 17% in Honduras, 14% in El Salvador and 14% in Nicaragua.

During the third week of August, the Ministry of Agriculture and Livestock of El Salvador delivered 53,299 packages of improved bean seed for last sowing to the same number of farmers in the eastern region (an area with the greatest damage due to rain deficit).

The delay and the lack of rainfall in Honduras have caused total and partial damage according to production areas in the first crops, according to the phenological state where they were during critical drought periods.

The Permanent Commission for Contingency Assistance of Honduras has identified 97 municipalities in the republic with damage, where the estimated affected population is 114,511 families.

In Nicaragua, according to the evaluation of the impact of the drought, there were total losses in the first crops, dry wells, sale of cattle due to high risk of death from drought and high risk of loss of last crops.

According to a report of the Mesoamerica Integration and Development Project (2014), the damage reported in Central America due to the 2014 drought includes general damage of 5% to 6% in the total production of corn and beans at the national level estimated in Guatemala. In El Salvador, out of an average of 278,942 hectares planted with corn, about 66,918 hectares have been lost as a result of water stress. With respect to beans, losses are estimated at 31,698 hectares, equivalent to 2.4 million hundredweights for the harvest. 2014-2015, which means almost 90% of total production if the production 2013-2014, which was 2.6 million hundredweights, is taken as a reference.

In Honduras 76,712 small producers' families (corn, beans and sorghum) were affected. In Nicaragua, 57,000 of the 275,000 blocks of corn were lost and, in the case of beans, 31,000 of the 100,000 blocks were totally damaged.

In Costa Rica, according to data from the Ministry of Agriculture and Livestock, losses in the sector are around 13 million dollars in the production of basic grains and 6.5 million dollars in the livestock sector. In Panama, 72,500 head of cattle were affected by weight loss for meat distribution.

E. Extreme events and cost of disasters

Tropical storms, hurricanes and flood

Global storm records reveal high volatility with an increase in the number of events over the last three decades in the Atlantic Ocean (see figure VIII.6); moderate to short-term storms are more likely to occur.

Another important breakthrough in the Central American subregion is related to changes in the occurrence of hurricanes and tropical storms. Although floods have risen due to storms and hurricanes in the Atlantic, in recent years there have been hurricanes that enter through the Pacific Ocean, although in previous years they did so towards the north.

In the Mesoamerican sub-region, in historical terms, most events with disaster potential have a climate background, according to the EM-DAT database of the Catholic University of Louvain. As shown in figure VIII.7, storms, floods, droughts, landslides, extreme temperatures and mudslides account for 55.1% of total records. In this sense, it is important to insist on the importance of information for decision making, disaster risk management and post-disaster assessment. The Mesoamerican Network for Disaster Risk Management and the ECLAC Methodology for Disaster Assessment are among the main efforts.

The constant updating of data and the use of monitoring tools would allow the design of interventions to reduce disaster risk, projections of potential damage and sectoral losses, prioritizing interventions in exposed or vulnerable sectors, and optimizing the response, among others. This information is also essential for designing financial protection plans and building comprehensive disaster risk management strategies, especially for regional micro and SMEs.

According to the EM-DAT, the total value of damage caused by disasters in the Mesoamerican region between 1950 and 2018 is 86.3 billion dollars. Disasters associated with meteorological events have contributed 59.7 billion dollars, equivalent to 69% of total damage, followed by earthquake disasters with 22.7 billion dollars, equivalent to 26% of total damage.

Disaster assessments conducted by ECLAC reach 23 billion at 2008 prices, four times the cost of expanding the Panama Canal, or the equivalent of El Salvador's GDP in 2013. The most affected sectors were the productive ones, with 11.2 billion dollars, equivalent to 48.5 per cent of the total, followed by infrastructure with 6 billion dollars and the social sectors with 3.8 billion dollars (see table VIII.4).

Figure VIII.6
Atlantic Ocean: number of hurricanes, tropical and subtropical storms, 1878-2018
(Number of events)
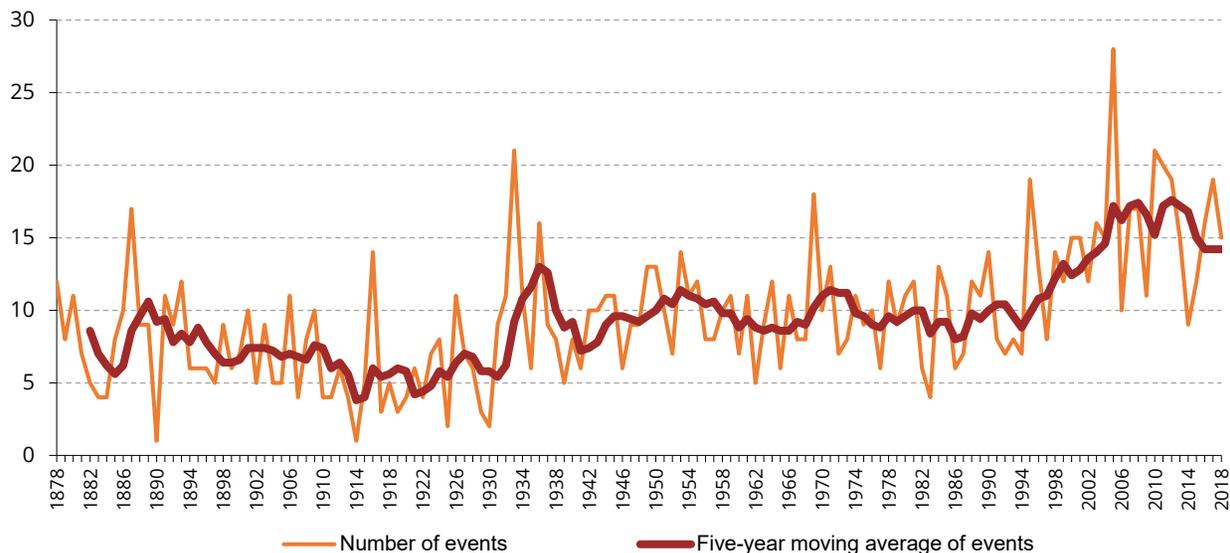
Source: Based on National Oceanic and Atmospheric Administration (NOAA) [online] https://www.noaa.gov/.

Figure VIII.7
Mesoamerica: major extreme events recorded, 1900 to 2018
(Percentages)
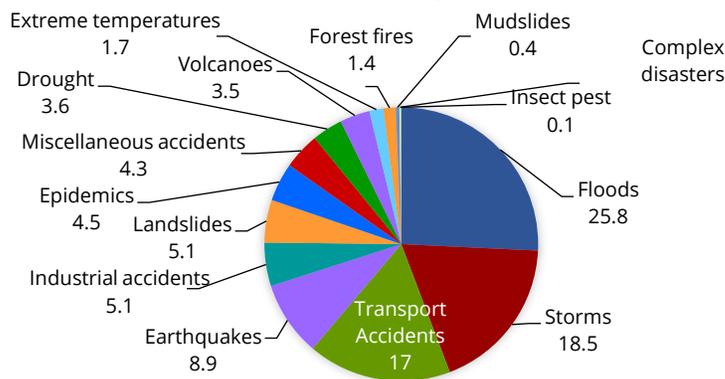
Source: EM-DAT, OFDA/CRED International Disaster Database, Université Catholique de Louvain.

From the losses registered in the productive sectors, 66% correspond to agricultural activities. This reflects the vulnerability of the rural areas, which deserves risk management oriented to mitigate frailty and expand the robustness of public and private infrastructure, as well as the resilience of production, of the institutions and of the population in poverty.

According to evaluations of disasters in Mexico carried out by the National Center for Disaster Prevention (CENAPRED, 2016), between 2000 and 2015 the costs of tropical cyclones, floods, extreme rains and droughts sum up to more than 26.3 billion dollars with more than 11 million people affected; in this case it includes events with minor impacts up to those with greater impact.

Likewise, it has been determined that, from the 153 coastal municipalities of the country, 25 exhibit the greatest historical vulnerability. In these 25 municipalities, the greatest potential economic and social costs of increasing the number or intensity of hurricanes are calculated, although the estimated economic costs of damage caused by hurricanes have averaged 0.12% of GDP in the period 1997-2005. The worst year in the series was 2005. An estimated cost of 0.59% of GDP has been accounted for.

The 25 municipalities that are most at risk from tropical storms and hurricanes have an estimated of 4,000,273 inhabitants at potential risk, including an estimated of 1,037,000 homes (owned or rented) and a production of 977 million dollars in the agricultural sector, 460 million dollars in livestock production and 2,905 million dollars in tourism activities (Galindo, 2009).

EM-DAT, disaster events have caused 7.2 billion dollars in damage between 1950 and 2018. Events related to meteorological factors have registered damages of 3.6 billion dollars, equivalent to 50% of the total, while volcanic events and earthquakes have reached damages of 3.3 billion dollars, equivalent to 46% of the total. These events have left 38,428 people dead and 18.2 million people affected.

Table VIII.4
Central America: economic losses due to major extreme events, 1974-2011
(Millions of dollars at 2008 prices)

Year	Event	Total by sector	Social sector	Infrastructure	Productive sector	Environment	Impact on women and others
1974	H. Fifi	523.1	102.6	16.6	403.9	-	-
1979	H. David and Federico	1 701.8	163.9	300.8	1 237.1	-	-
1982	Floods	975.6	111.5	451.3	412.8	-	-
1988	H. Joan	1 412.7	606.5	289.3	234.3	282.6	-
1996	H. César	270.9	59.6	146.5	63.9	-	-
1997	El Niño	110.0	1.6	28.7	71.7	8.0	-
1998	H. George	2 897.2	426.4	879.0	1 428.1	163.7	-
1998	H. Mitch	7 935.4	1 054.6	1 644.3	5 147.5	89.0	-
2000	H. Keith	398.9	55.4	65.2	242.4	35.9	-
2001	Drought	171.2	-	33.2	138.0	-	-
2003	Floods	49.7	3.5	9.8	36.4	-	-
2004	H. Jeanne	347.8	18.2	106.0	220.2	3.4	-
2005	TT. Stan	1 361.0	334.4	619.4	362.6	44.6	-
2007	H. Dean	108.0	20.7	7.1	76.2	4.0	-
2007	H. Félix/Floods	883.0	94.3	149.1	74.1	565.5	-
2008	TT. Noel	445.9	84.7	142.2	225.4	3.6	-
2009	TT. IDA	316.0	39.8	133.2	82.7	60.3	-
2010	TT. Agatha/Pacaya Volcano Eruption	1 087.7	238.0	401.8	151.1	270.2	26.6
2011	DT.12 E	1 884.7	362.3	640.1	575.1	299.5	7.7
	Accumulated losses	22 889.7	3 778.1	6 063.7	11 183.4	1 830.3	34.3

Source: Economic Commission for Latin America and the Caribbean (ECLAC), *Gestión integral de riesgos y seguros agropecuarios en Centroamérica y la República Dominicana: situación actual y líneas de acción potenciales* (LC/MEX/L.1122), México, D.F., 2013.
Note: Deflated by the U.S. Consumer Price Index (CPI). H = Hurricane; TT = Tropical storms; DT = Tropical depression.

IX. Housing

Household rights were recognized for the first time at the international level in the 1948 Universal Declaration of Human Rights. Therefore, the right to housing is a fundamental human right and as such should be understood in a wider context as the right to live in security, peace and dignity somewhere and not as the simple fact of having a roof over one's head. The importance of this right in Mesoamerica is reflected in the fact that its protection is established in the constitutions of nine of the ten countries of the Mesoamerica Integration and Development Project (see table IX.1).

Table IX.1
Mesoamerica: constitutional protection for housing rights

Country	Legislation
Colombia (1991)	Article 51
	All Colombians have the right to decent housing. The State will establish the necessary conditions to make this right effective and will implement social housing plans, adequate long-term financing systems and associative forms of execution of these programs.
	Article 64
	It is the duty of the State to promote progressive access to land ownership for agricultural workers, individually or in associations, and to education, health, housing, social security, recreation, credit, communications, marketing of products, technical and business assistance, in order to improve the income and quality of life of peasants.
Costa Rica (1949)	Article 65
	The State will create the construction of popular housing and will create the worker's family patrimony.
Dominican Republic (1966)	Article 8
	15 (b). It is declared of great social interest the establishment of each Dominican home not in land or own improvements. To this end, the State shall encourage the development of public credit on socially advantageous terms, designed to enable all Dominicans to have comfortable and hygienic housing.
	17. The State shall also provide social assistance to the poor. The State shall also provide social assistance to the poor in the form of food, clothing and, as far as possible, adequate housing.
El Salvador (1984)	Article 51
	The law shall determine the enterprises and establishments which, because of their special conditions, are obliged to provide the worker and his family with adequate rooms, schools, medical assistance and other facilities and services necessary for their well-being.
	Article 119
	The construction of housing is declared to be of social interest. The State shall ensure that as many Salvadorian families as possible become homeowners. It shall encourage every owner of rural properties to provide resident workers with a hygienic and comfortable room and adequate facilities for temporary workers; and to this end, it shall provide the small owner with the necessary means.

Country	Legislation
Guatemala (1985)	Article 105 The State, through the specific entities, will support the planning and construction of housing complexes, establishing adequate financing systems that allow for different programs, so that workers can choose adequate housing and meet health conditions. The owners of the companies are forced to provide their workers, in the cases established by law, housing that meets the above requirements. Article 119 (g) These are fundamental obligations of the State: to encourage the construction of popular housing as a priority, through adequate financing systems so that the greatest number of Guatemalan families can enjoy them as property. In the case of emerging or cooperative housing, the tenancy system may be different.
Honduras (1982)	Article 118 The family estate is subject to special legislation to protect and promote it. Article 123 Every child will be able to enjoy the benefits of social security and education. The right to grow and develop in good health, for which purpose it shall be provided, both to him and to his mother, special care from the prenatal period, having the right to enjoy adequate food, housing, education, recreation, sports and medical services Article 178 Hondurans are given the right to decent housing. The State shall formulate and implement social housing programs. Article 179 The State will support and regulate the creation of systems and mechanisms for the use of internal and external resources to be channelled towards the solution of the housing problem.
Mexico (1983)	Article 4 Every family has the right to decent housing. The law shall establish the instruments and supports necessary to achieve this objective.
Nicaragua (1987)	Article 64 Nicaraguans have the right to decent, comfortable and safe housing that guarantees family privacy. The State of Nicaragua has the obligation to fulfil this right.
Panama (1978)	Article 113 The State will establish a national housing policy aimed at providing the enjoyment of this social right to the entire population, especially to low-income sectors.

Source: Economic Commission for Latin America and the Caribbean (ECLAC) based on the constitutions of the countries.

As defined by UN -Habitat[6], housing can act as a catalyst for socio-economic development and poverty reduction. It is also a cross-cutting factor in almost every other human development indicator.

Ensuring access to decent and affordable housing prevents injuries, illness and premature death; at the same time, it increases national and household incomes. In addition, the population's access to decent and affordable housing ensures a better quality of life for citizens, providing States with social and political stability. Finally, secure housing provides financial protection and socio-economic resilience to the effects of climate change and natural hazards.

As an economic and social development indicator, housing is particularly important in Latin America and the Caribbean, as it is the most urbanized developing region in the world. According to CEPALSTAT data, 80% of the region's population were living in urban areas by 2015 and this number is projected to reach 84% by 2030. In this context, facilitating access to decent housing appears to be one of the great challenges that the region must overcome in its development process.

Another characteristic of the region's housing market is the high percentage of ownership status. As shown in figure IX.1, except for Colombia and the Dominican Republic, the levels recorded by countries in the region in this dimension exceed 60%, and in some cases, such as Panama and Nicaragua, 75%.

Among the reasons that explain this high percentage are the increase in credit facilities for the middle and upper classes, the social preference of

ownership over other forms of property ownership such as rent and the most worrying fact, the proliferation of informal constructions as a mechanism used by the most disadvantaged groups of the population to solve their problems of access to the formal housing market (see figure IX.2). This last challenge increases the vulnerability of these populations to the effects of climate change and disasters and affects their socio-economic and productive resilience also.

Figure IX.1
Mesoamerica and selected countries: households by tenure status, 2017
(As a percentage of total households)
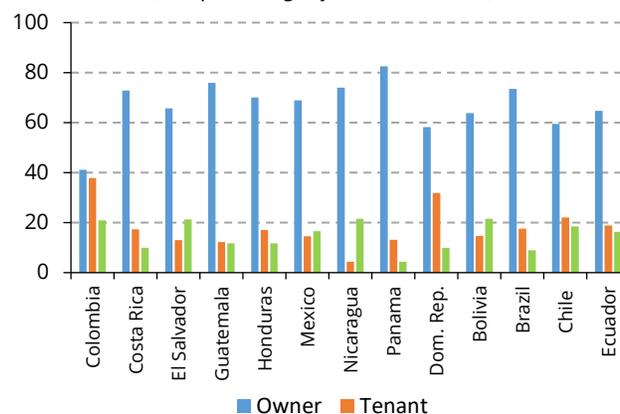
Owner · Tenant

Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html.
Note: There is no data available for Belize. Data for Colombia, Costa Rica, El Salvador, Panama, Bolivia (Plurinational State of), Brazil, Chile, Ecuador and the Dominican Republic are for 2017. Data for Honduras and Mexico are for 2016. Data for Guatemala and Nicaragua correspond to 2014.

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[6] The United Nations agency specialized in promoting the political, economic, social and environmental sustainability of human settlements and cities around the world.

Figure IX.2

**Latin America and the Caribbean: percentage of urban population living in slums, informal settlements or inadequate housing, 2000 and 2014**
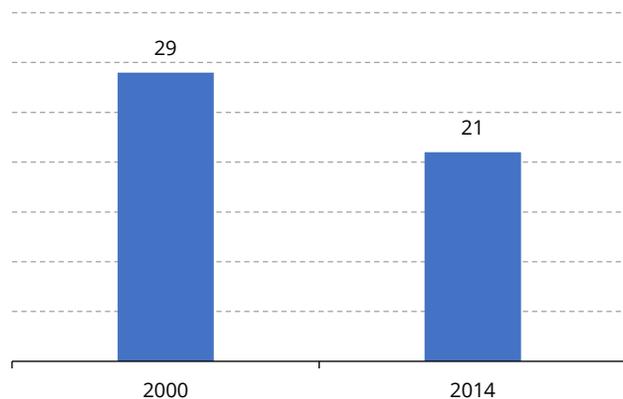
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html [consultation date: February 2019].

The countries of Mesoamerica also face the problems associated with accelerated urbanization and inequality in the region overall. Failures in areas such as urban planning, urban regulation, access to financing or difficulties in assigning property rights over land and properties, among others, impact the market's ability to offer decent and accessible housing to the entire Mesoamerican population.

As a result, the Mesoamerican housing market lacks a deficit that complicates the region's socioeconomic development and creates spaces of separation that create an environment of vulnerability and exclusion for its inhabitants (see tables IX.2 and IX.3).

Figure IX.3

Mesoamerica: urban population living in slums, informal settlements or inadequate housing, 2014

(Percentages of the urban population)
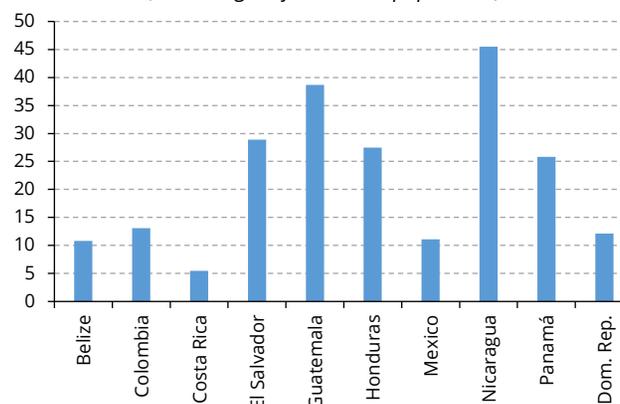
Source: Economic Commission for Latin America and the Caribbean (ECLAC), based on CEPALSTAT [online database] http://estadisticas.cepal.org/cepalstat/Portada.html [consultation date: February 2019].

Housing markets in Mesoamerican countries have significant deficits, not only quantitative -those that measure the number of households living in inadequate housing with no possibility of repair- but also qualitative -those that measure housing with a lack of building materials, overcrowding, infrastructure or secure tenure in particular (see table IX.2).

Table IX.2
Mesoamerica: total housing deficit by country, 2009
(Percentages of total households)

Country	National	Urban	Rural	I	II	III	IV	V
				Urban quintiles per household per capita income				
Colombia	37	27	71	47	32	26	19	12
Costa Rica	18	12	26	24	15	9	9	5
Dominican Republic	41	35	56	54	39	34	28	18
El Salvador	58	50	74	78	61	51	38	20
Guatemala	67	56	79	77	70	59	46	30
Honduras	57	42	72	65	55	44	30	18
Mexico	34	28	58	46	33	27	19	14
Nicaragua	78	70	88	87	83	72	68	41
Panama	39	37	58	62	46	31	26	14

Source: Patricio Bouillon (ed.), A Space for Development: Housing Markets in Latin America and the Caribbean, Washington, D.C., Inter-American Development Bank (IDB), 2012.
Note: No data available for Belize.

Numbers of total deficits in the countries of the Mesoamerican region show how, despite the economic progress experienced in recent years, large sectors of the population still live in places that do not meet the conditions guaranteeing that housing fulfils its basic function of serving as an axis for the socio-economic progress of its citizens (see table IX.3).

Table IX.3
Mesoamerica: urban housing deficit by country, 2009
(Percentages of total households)

Country	Quantitative deficit	Qualitative deficit				
		Total	Material	Overcrowding	Infrastructure	Lack of secure tenure
Colombia	9	19	7	4	9	10
Costa Rica	2	10	5	1	1	6
Dominican Republic	3	32	5	3	25	9
El Salvador	8	41	21	16	30	17
Guatemala	11	46	32	27	32	10
Honduras	2	41	18	14	26	12
Mexico	2	26	9	5	8	15
Nicaragua	12	58	33	28	52	10
Panama	8	29	7	6	22	13

Source: César Patricio Bouillon (ed.), *A Space for Development: Housing Markets in Latin America and the Caribbean, Washington, D.C., Inter-American Development Bank (IADB)*, 2012.
Note: No data available for Belize.

One major obstacle to access to the formal housing market is the reduced ability to access to formal mortgage loans and their cost. In addition, lower income sectors of the population are excluded from accessing mortgage loans, as the proportion of housing-income price of formal housing in Latin America comes in a ratio of 6 to 1 (UN-Habitat, 2011).[7]

Addressing the housing problems of people with lower incomes is one of the pending tasks of governments at the global level. In this sense, some financial inclusion and microfinance policies offer windows of opportunity to extend the formal housing market to the most disadvantaged. Such is the case of CABEI's Financial Intermediation Program, which has benefited 7,700 families in Costa Rica, El Salvador, Guatemala, Honduras and Nicaragua.

Besides funding, there are also several areas of regulatory improvement to provide a favourable environment for the purchase and access to decent housing, improve the housing conditions of pre-existing substandard housing and advance in the improvement of neighbourhoods and urban areas of the region.

Despite heterogeneity in the behaviour and size of the different housing markets in Mesoamerica, all the countries of the subregion experience similar problems in guaranteeing access for their citizens to decent housing. This highlights the importance of the tasks undertaken by the governments of the Mesoamerican countries to put an end to the areas of segregation and exclusion that are the slums without basic services, and which are still found in most of the Mesoamerican urban areas.

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[7] The house-income price ratio is typically defined as the ratio of the average price of the completed dwelling to the average household income.

X. Conclusions

Country members of the Mesoamerica Integration and Development Project constitute an important cluster of the LAC region, in terms of economic importance and population. Although there is heterogeneity among the magnitudes and economic structures, these countries share several challenges in social and economic matters, including trade, transport, energy, environment, risk management, health, housing, among others, which can be addressed easily through regional cooperation and coordination.

Furthermore, to maximize the efforts made within the framework of the MP, regional strategies available to SICA members should be considered and synergies should continue to be generated that provide infrastructure and public policies at the service of the regional reality.

Projections for 2019 suggest that for the international context there will be an environment of low economic growth, although within an environment where risks persist that may obstruct this trend. In this context, facilitating the strengthening of intraregional markets appears as a strategy to diversify both the export basket and the international buyers of the region. Unclogging the technical and physical barriers that prevent further development of the intraregional market also has a positive impact on increasing the inclusion of SMEs in export markets and generates a virtuous circle that improves the competitiveness of the Mesoamerican economies.

Efforts to consolidate fiscal and restrictive public expenditure policies in the region have led to low levels of public investment in transport infrastructure. This lack of public investment has not been replaced by private investment, which has resulted in the deterioration of existing infrastructure and a reduced capacity to meet the demands of economic growth.

Adding the regional vision for the construction and planning of public transport works facilitates access to resources, as well as increased levels of usage and larger dimensions, which strengthens the interest of investors and operators in supporting regional projects and allows Mesoamerican countries to renew and create a transport infrastructure that promotes a more competitive and sustainable productive environment.

Regarding the energy sector, which is an important pillar for enhancing Mesoamerican competitiveness, the MP countries have shown different energy matrices, mainly in terms of the level of consumption and origin of primary energy production. However, there are common challenges in the region in terms of the high dependence on hydrocarbons and low level of participation of renewable energies, the lack of access by large population groups to electricity and the high levels of electricity losses that the current infrastructure has. The completion of SIEPAC by the members of SICA is one of the great advances in energy in the Mesoamerican region as an entire region.

Among the great assets of the Mesoamerican region is the biodiversity and richness of its natural environment. Deforestation and other phenomena deriving from or promoted by climate change (droughts, increased aridity of soils and the greater preponderance of extreme events, among others) place

the region in a situation of vulnerability that must be mitigated through preventive strategies of Disaster risk management and response to climate change. However, it also offers opportunities for building resilience and fostering competitiveness through innovation.

Aside from a more prepared approach to reducing vulnerabilities and risks and responding to the impacts of events such as fires, storms, hurricanes or earthquakes, the region can move towards multidimensional risk prevention and management strategies, including from adapting infrastructure to plans to minimize the economic impacts of these phenomena on the economic and productive structure of the countries, with special attention to micro and SME's in the region. These measures have the potential to increase socio-productive resilience, encourage investment and innovation, and protect public and private investments in a context of environmental sustainability.

Activities, such as agriculture, electricity production and tourism, that depend on their economic viability on climate conditions are affected by climate change, which could deteriorate the economic and social situation of the MP countries. Both agriculture and tourism play an important role in the economic structure of the Mesoamerican countries, as well as being the main sources of income for a large part of the rural world in Mesoamerica. These challenges call for rethinking and modernizing these sectors so that they continue to act as generators of employment, entrepreneurship and well-being in the

context of the changes and opportunities offered by the digital revolution, climate change and disasters.

Demographic growth and urban development in Mesoamerica also create health and housing challenges that provide opportunities for regional cooperation. The region's health systems are going to be pressured by population increases and aging. On the other hand, the region's health systems face joint challenges in the form of improved access to primary health care, the elimination of dengue fever and other regional health threats such as chikungunya.

An issue that deserves special attention is the high mortality rates related to road traffic, in addition to a matter of improving transport infrastructure, the high number of people who lose their lives on Mesoamerican roads represents an incalculable cost and requires immediate and decisive action. It also invites to redefine regional mobility, taking advantage of the opportunities offered by co-modality, efficient systems, and inclusiveness.

Rising population and increasing urbanization in the region have led to a disorderly and unequal development of Mesoamerican urban centres. In this context, large concentrations of population have been cantered in slums and other informal housing solutions built without following structured urban development plans.

All major cities in Mesoamerica experience this phenomenon and therefore collaboration on best practices of urban planning and the construction of decent residential areas is a challenge that reaches regional dimension.

Lastly, the space for dialogue and cooperation around the MP provides the region with a forum for coordination, dialogue, joint work and exchange of good practices and lessons learned. This space should be valued since it allows member countries to generate regional public policies that facilitate national strategies for growth and socioeconomic development. Approaching such development from a regional perspective will help to make it more efficient and inclusive.

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This document is a contribution of the Economic Commission for Latin America and the Caribbean (ECLAC) to the information collection and the deliberations of the "XVII Summit of Heads of State and Government of the Tuxtla Mechanism of Dialogue and Cooperation." ECLAC, as a member of the Interinstitutional Technical Group, ratifies its commitment with regional integration. Furthermore, this third edition of the document "A glance at member countries of the Mesoamerica Integration and Development Project" (2012 and 2015), underlines its support for the integration and development activities carried out by the Mesoamerica Integration and Development Project (MP). This view offers a concise panorama of the economic, social and environmental reality of the Mesoamerican region. The document summarizes the main challenges and opportunities found in the different components of the MP portfolio: economic development; trade and investment; competitiveness, small and medium enterprises and information and communication technologies; logistics and mobility; energy; health; nutrition and food security; housing; and environment, disaster risk management and climate change. These challenges can be tackled more easily through regional coordination and cooperation and are reminders of the importance of coordinating strategies with regional integration institutions and national policies.

| Housing | Transport | Health | Telecommu- nications | Environment | Trade Facilitation | Energy | Food Safety | Risk Management |