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## Forest loss in Latin America and the Caribbean from 1990 to 2020: the statistical evidence

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Forests play an important role as providers of sustenance and livelihoods for people living in forested areas and are the largest repository of terrestrial biological diversity on the planet.

They play a key part in climate change mitigation and adaptation because of their capacity to absorb carbon dioxide (CO<sub>2</sub>) and fix it in the form of biomass. They also provide environmental services by regulating the water cycle, protecting soils and supplying resources such as timber, medicines, food and fibres.

According to the *Global Forest Resources Assessment 2020* (FAO), the total area of forest in the world is 4.06 billion hectares (ha), or 31% of the planet's land surface. More than half the world's forest area is in just five countries, with one country in the region, Brazil, being the world's second most forested.

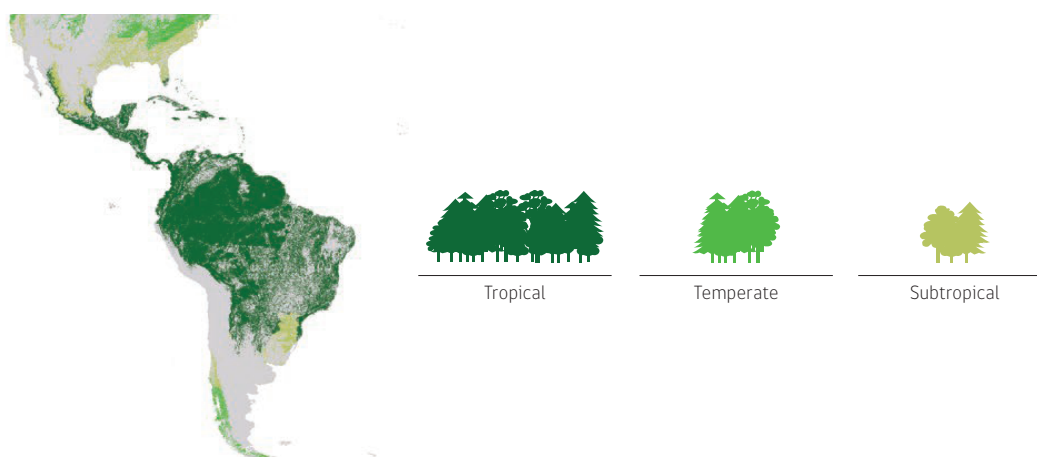
Given the importance of the study of forests, this paper will analyse topics such as forest cover, forest composition, land-use changes and mangrove cover at both the regional and national levels.

## 1. The region's forest cover is declining

In addition to their important role as providers of sustenance and livelihoods for people living in forested areas, forests are the largest repository of terrestrial biodiversity on the planet. Forests play a key role in climate change mitigation and adaptation because of their ability to sequester atmospheric carbon. They also provide environmental services by regulating hydrological cycles and stabilizing landscapes, contribute to soil and water conservation in fragile ecosystems and provide opportunities for recreation and tourism.

The Latin American and Caribbean region is home to 23% of the world's forests. Map 1 shows the spatial distribution of tropical, temperate and subtropical forest cover in the region as of 2020.

### » Map 1. Forest cover in Latin America and the Caribbean by climatic domain, 2020



Source: Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020: Key findings, 2020* [online] <http://www.fao.org/3/CA8753EN/CA8753EN.pdf>.

Note: The boundaries and names shown on this map do not imply official endorsement or acceptance by the United Nations.

However, the region's forest area has decreased over the past 30 years, and in particular it has lost natural forest, both in absolute terms and in relation to land area (see figure 1).

Between 1990 and 2020, forest cover in the region declined steadily from 53% to 46% of its land area. Whereas the region's forested area totalled some 1.07 billion ha in the early 1990s, it had shrunk to 960 million ha by 2010 and to 932 million ha by 2020. Thus, the total loss of forest cover across the region between 1990 and 2020 was 138 million ha, equivalent to just over the entire area of Peru or half the area of Argentina.

## » Figure 1. Latin America and the Caribbean: forest cover, total forested area and areas of natural forest and forest plantations

(Millions of hectares and percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT, on the basis of Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020*: [online] <https://fra-platform.herokuapp.com/>

Note: The Forest Resources Assessment totals differ slightly from the sum of the disaggregated figures because values for forest plantations are lacking in some countries.

## 2. Natural forests are shrinking and plantations are expanding

The forested area is composed mainly of natural forests, which accounted for 97.7% of the total in 2020, and of forest plantations (2.3%).<sup>1</sup> The statistics show a decrease in the total forested area resulting from a considerable drop in natural forest cover that has not been offset by the expansion of forest plantations. Considering the whole region, the area covered by natural forest decreased by 150 million ha between 1990 and 2020, while forest plantation cover increased by only 14 million ha.

According to the trends observed in the region, the loss of forest area is explained by new uses of land for agriculture, forestry and stockbreeding and, to a lesser extent, by the expansion of cities and highway building associated with a variety of economic activities.

However, the pattern is very uneven in the region. Forest cover dynamics at the national scale are described below.

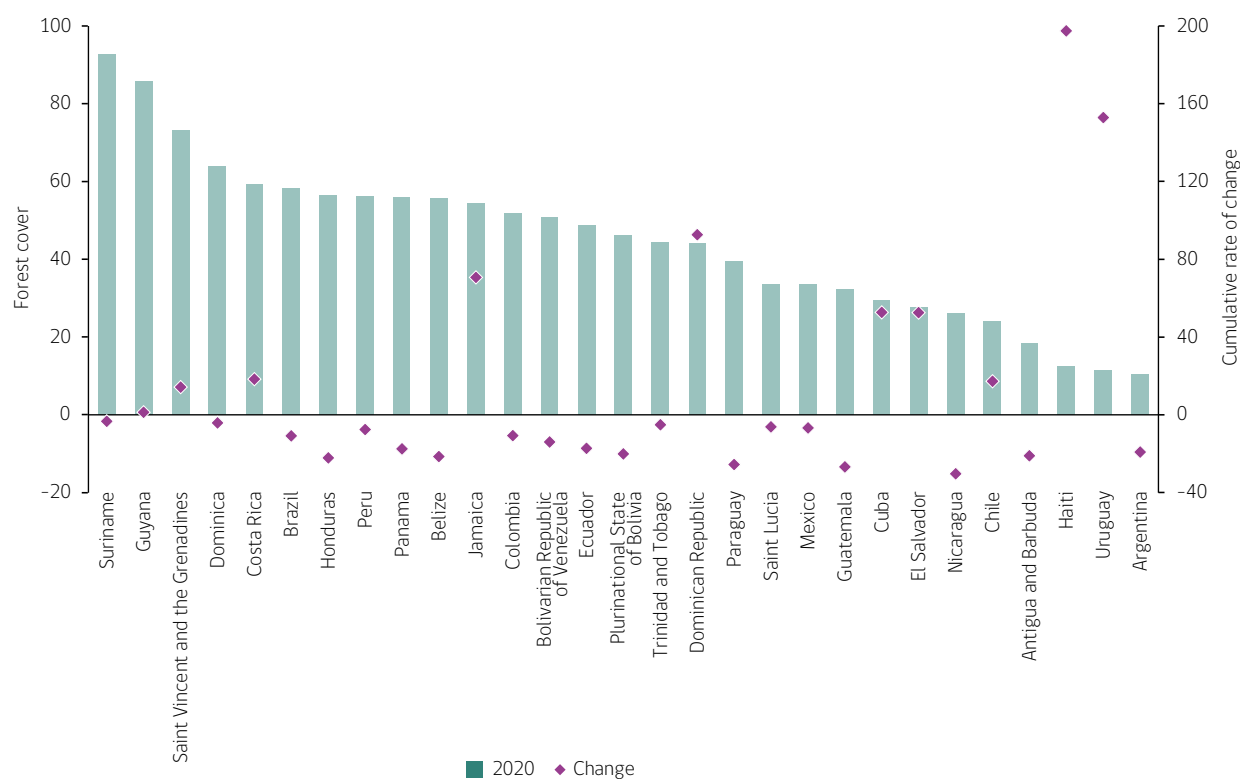
<sup>1</sup> There has also been a change in the composition of forests, since in 1990 natural forests accounted for 99% and plantations for only 1%.

### 3. Changes in forest cover at the national level

The degree of forest cover in relation to the territory of the region's countries varies greatly depending on their size and their particular ecosystemic and geographical conditions. As of 2020, forests covered more than 40% of the land area in 17 countries, between 20% and 39% in 8 countries and less than 19% in the remaining 4 countries (see figure 2).

» **Figure 2. Countries of Latin America and the Caribbean: forest cover in 2020 and cumulative rates of change, 1990–2020**

(Percentages)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT on the basis of Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020*: [online] <https://fra-platform.herokuapp.com/>

The downward trend in the region's forest cover is explained mainly by the decline in the large forested countries over the past 30 years. Brazil, home to 53.3% of the whole region's forests, has lost 92.3 million ha of forest in the last 30 years, while the Plurinational State of Bolivia has lost 7 million, Argentina 6.6 million, Colombia 5.8 million and Paraguay 9.4 million ha. Although the areas involved are smaller, the rates of negative change in forest cover have been very high in Nicaragua (30.3%), Guatemala (26.9%), Paraguay (25.7%) and Honduras (22.3%).

Over the same period, the area of forest and the proportion of land covered by it increased in 10 countries (Chile, Costa Rica, Cuba, the Dominican Republic, El Salvador, Guyana, Haiti, Jamaica, Saint Vincent and the Grenadines and Uruguay). Cumulative growth in the proportion of forest cover was particularly rapid in Haiti (197.4%), Uruguay (152.9%), the Dominican Republic (92.6%) and Jamaica (70.7%).

Since countries where forest cover is increasing account for only 5.2% of the region's forest area, however, the prevailing trend in the region as a whole is one of forest loss.

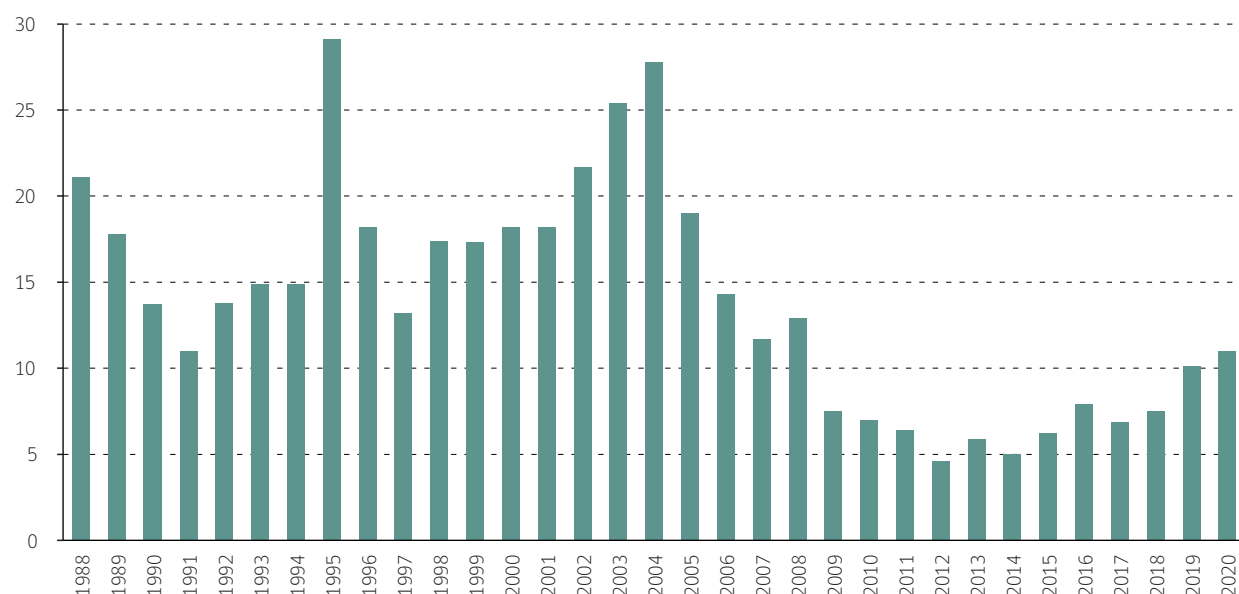
## 4. Land-use change: the movement between natural forest and crop-livestock-forestry activities

Statistics from Brazil and Costa Rica show land use and land cover moving in opposite directions.

As mentioned above, Brazil is home to more than 53% of the forest area of the entire region (497 million ha) and is the country with the second largest area of forest in the world after the Russian Federation.<sup>2</sup> Satellite imagery has been used to monitor the annual rate of deforestation by logging in the Brazilian Legal Amazon between 1988 and 2020 (see figure 3). Although the area deforested each year decreased significantly between 2004 and 2012, deforestation has accelerated since 2012, and particularly in recent years, with 11,088 km<sup>2</sup> being deforested in 2020.

» Figure 3. Deforestation in the Legal Amazon, 1988–2020

(Thousands of km<sup>2</sup>/year)



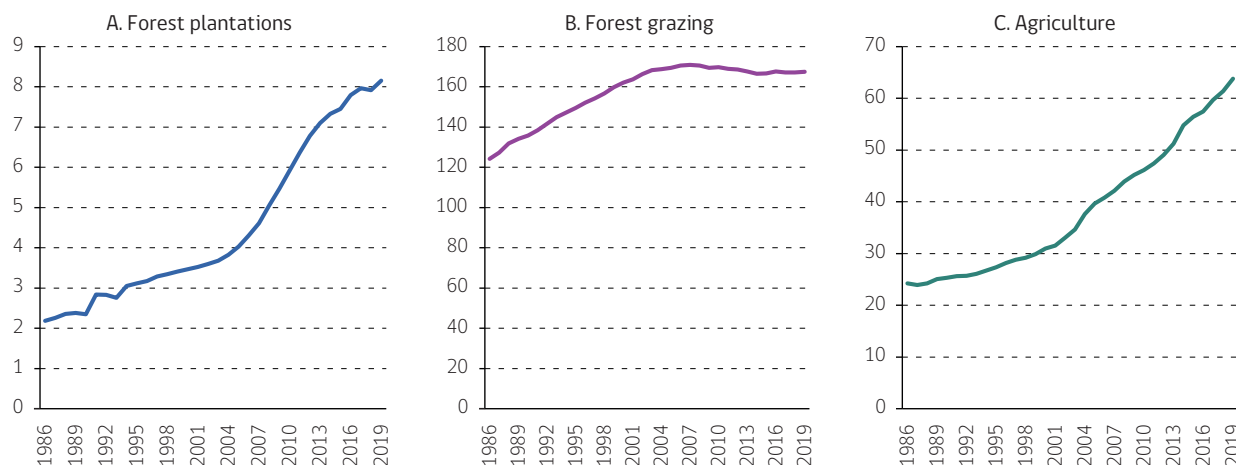
Source: National Institute for Space Research (INPE), Satellite Monitoring of Deforestation in the Legal Amazon Project (PRODES), 2019.

In parallel, most of the forest lost in Brazil between 1986 and 2019 was replaced by agriculture, plantation forestry and livestock (grazing) activities (see figure 4). The agricultural and grazing sectors are the ones that use the largest percentage of land relative to the forestry sector. Analysis of how different activities have evolved during the period under study shows that the sectors that have grown the most are forestry, with an increase in surface area of 274% in the period, and agriculture, with an increase in surface area of 160%. The use of land for grazing, associated with the livestock sector, grew strongly until 2000, but growth has slowed and even gone into reverse during the last decade.

<sup>2</sup> See Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020: Key findings, 2020* [online] <http://www.fao.org/3/CA8753EN/CA8753EN.pdf>.

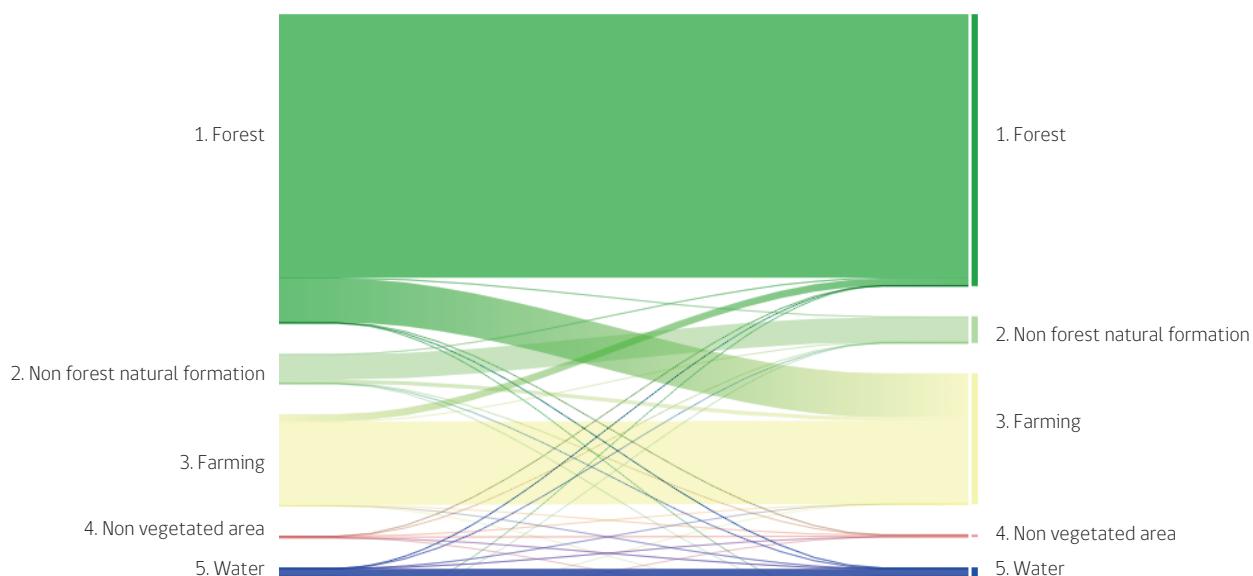
## » Figure 4. Land area given over to forest plantations, grazing and agriculture in Brazil, 1986–2019

(Millions of hectares)



Source: MapBiomas, "Collection v3.1 of Brazilian Land Cover & Use Map Series" [online] <http://mapbiomas.org/> [date of reference: 13 May 2013].

## » Figure 5. Conversion of forested areas in Brazil, 1985–2019



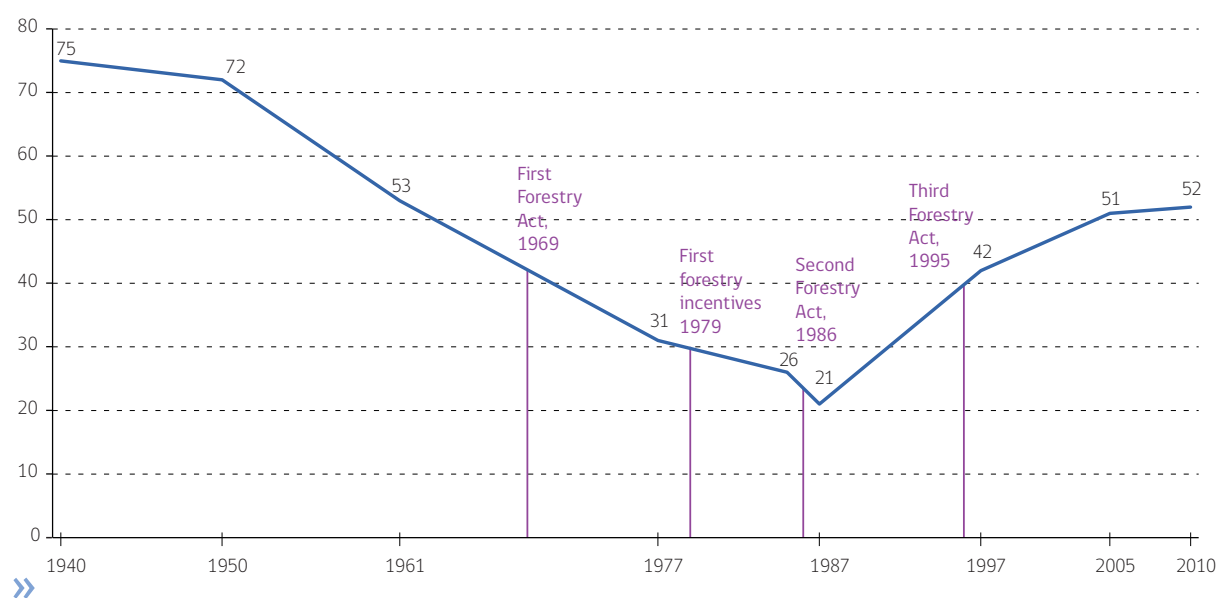
Source: MapBiomas, "Collection v3.1 of Brazilian Land Cover & Use Map Series" [online] <http://mapbiomas.org/> [date of reference: 13 May 2013].

Thus, most of the land where forest was lost in Brazil between 1985 and 2019 was turned over to forestry and livestock farming.

- Commercial plantations increased by 274%.
- The farmed area grew by 160%.
- The area used for livestock stopped growing in the early 2000s.

By contrast, in Costa Rica, which accounts for 0.32% of the region's forest, figure 6 shows a period of forest loss between 1940 and 1987 followed by an increase in forest cover and changes in land cover and land use due to recovery and reforestation policies. Thus, forest cover increased in Costa Rica, replacing land previously given over to farming and livestock activities.

» Figure 6. Forest cover in Costa Rica



Source: Central Bank of Costa Rica, on the basis of data from the National System of Conservation Areas (SINAC) "Cuentas de bosque y sus aplicaciones", paper presented at the fifth regional webinar, Santiago, Economic Commission for Latin America and the Caribbean (ECLAC), 16–17 August 2018.

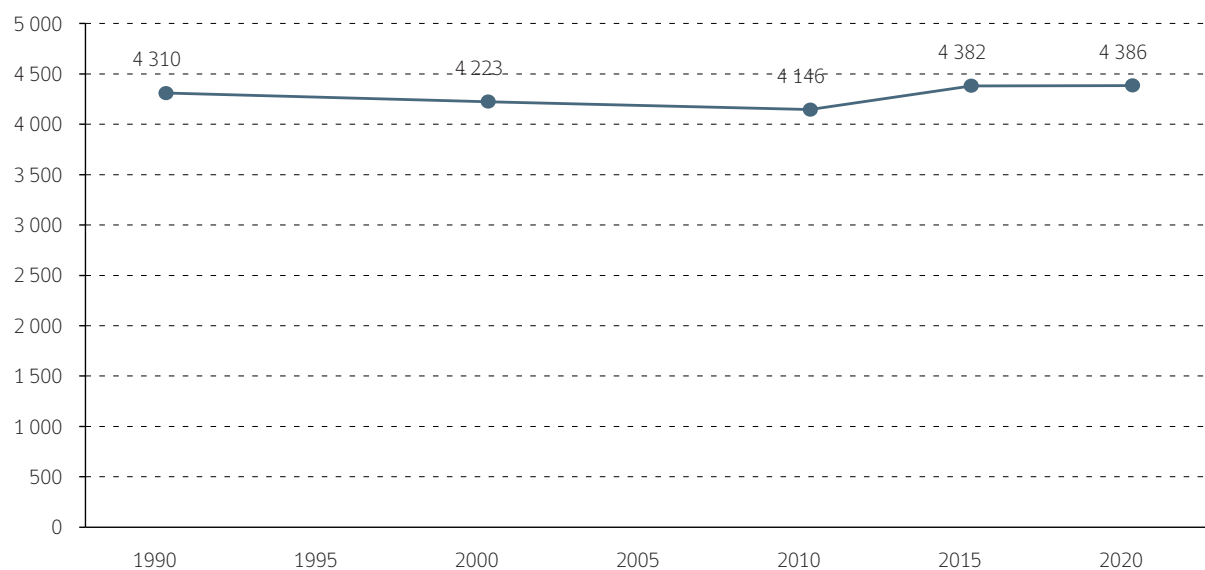
As has been seen, forest cover in Costa Rica has been increasing since 1992, at the expense of farmland.

## 5. The recovery of the area covered by mangroves in the region

Mangroves are a type of salt-tolerant forest ecosystem usually found along sheltered coasts and riverbanks in tropical and subtropical areas with brackish water. They supply nearby populations with timber and non-timber forest products (firewood, charcoal, food and medicines) and play an important role in preventing and reducing coastal erosion by providing protection against the effects of wind, waves and water and extreme climatological, meteorological and hydrological events and disasters. Mangroves also harbour biodiversity and provide spawning grounds and nurseries for fish, shellfish and marine fauna.

In contrast to the reduction of overall forest cover observed in the region, the area covered by mangroves is greater than it was three decades ago. Between 1990 and 2010, the average area covered by mangroves was around 4.1 million ha, but between 2005 and 2020 this average increased to 4.4 million ha. This means that 250,000 ha of new mangroves were added between 1990 and 2020, with Guyana and Cuba making the largest contributions: 195,000 and 115,000 ha, respectively. The area of new mangroves contributed by these countries, added to that of others where there was a lesser expansion, more than compensated for the decline in the area covered by mangroves in the Bolivarian Republic of Venezuela (120,000 ha) and Brazil (109,000 ha), the net result being an increase in mangrove area of 6.1% between 1990 and 2020.

» **Figure 7. Latin America and the Caribbean: area covered by mangroves, 1990–2020**  
(Thousands of hectares)



Source: Economic Commission for Latin America and the Caribbean (ECLAC), CEPALSTAT, on the basis of Food and Agriculture Organization of the United Nations (FAO), *Global Forest Resources Assessment 2020: Key findings, 2020* [online] <http://www.fao.org/3/CA8753EN/CA8753EN.pdf>.

### » Box 1. Technical note

Measurement of the surface area covered by forests has a strong spatial and territorial component. Hence, data collection is based on remote sensing (mainly satellite imagery) supplemented by ground truthing.

Forest indicators are thus expressed in terms of the land area covered or of biomass when what is being measured is the volume of forest. Because of their origin in geospatial data, forest indicators are often also represented cartographically or geospatially as an integral part of geographic information systems. This primary information is an input for the forest registers or inventories that the various countries in the region produce and update periodically. Since a substantial portion of forests are associated with farms, questions about forestry and silvicultural variables are also included in crop-livestock-forestry censuses.

#### **Global compilation of forest indicators**

This document was prepared by compiling official data on the Latin American countries from the Food and Agriculture Organization of the United Nations (FAO).



At the global level, FAO is the institution that compiles statistics and coordinates the Global Forest Resources Assessment (FRA), which has been carried out every 5 to 10 years since 1946, by gathering national data from United Nations Member States, its national counterparts usually being in the ministries or authorities responsible for forestry and agriculture. This exercise has helped to produce, improve and harmonize globally accepted definitions, concepts and classifiers, thus contributing to comparability over time and between countries.

### Statistical definition of forest (FAO)

Definition of forest: this is "land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use [...] Forest is determined both by the presence of trees and the absence of other predominant land uses."

### This definition

**includes:** areas with bamboo and palms, forest roads, firebreaks, forest in national parks, nature reserves and other protected areas and plantations for forestry or protection purposes.

**excludes:** tree stands in agricultural production systems, such as fruit tree plantations and agroforestry systems, and trees growing in urban gardens and parks.

Source: Food and Agriculture Organization of the United Nations (FAO), Global Forest Resources Assessment 2020: Key findings, 2020 [online] <http://www.fao.org/3/CA8753EN/CA8753EN.pdf>; "FRA 2015 Terms and Definitions", Forest Resources Assessment Working Paper 180, Rome, 2015.



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<https://www.cepal.org/en/work-areas/statistics>



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