

Deforestation remains a serious issue globally, as many countries continue to lose more trees than they regenerate. And in countries with expanding forest area, new growth is often of lower-quality plantation forests, which are cultivated to produce harvestable wood and are less ecologically complex than natural forests.

Global forest cover stands at approximately half the original extent of 8,000 years ago.¹ Modern rates of deforestation are a matter of dispute, however, because there is no common agreement on how to measure or even define a

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forest. The U.N. Food and Agriculture Organization (FAO), in its *2000 Global Forest Resources Assessment* (known as FRA 2000), which has the most recent data available, reported a net loss of 9.4 million hectares of forest a year during the 1990s, an annual loss roughly the size of Portugal.²

Gross forest losses were even larger, at some 14.6 million hectares, but they were offset by annual increases in natural forests and plantations of 5.2 million hectares.³ Africa and the Caribbean had the highest rates of deforestation, each losing 0.8 percent of forested area.⁴ Although FRA 2000 has been roundly criticized for using a methodology that underestimates the level of deforestation, other studies have found even lower levels of deforestation in the 1990s in some regions.⁵

Since 2000, deforestation has continued to be a concern in some of the world's major logging countries. Indonesia loses nearly 2 million hectares of forest annually, double the rate of the 1980s. The country's forest cover fell by 40 percent between 1950 and 2000, from 162 million to 98 million hectares.⁶ Meanwhile, Brazil announced in 2004 that deforestation rates equaled the near-record highs of 2003.⁷ More than 2.3 million hectares of Amazon forest—about half the area of Switzerland—were cut between August 2002 and 2003.⁸ If global deforestation rates have been the same since 2000 as they were in the 1990s, Brazil and Indonesia account for nearly half of the world's forest losses.

Deforestation is a concern because forests are important in regulating the planet's carbon

and hydrological flows and provide a host of local environmental services. Trees are essentially carbon warehouses. Their carbon is released to the atmosphere when the roots of felled trees rot in the ground and when the paper or wood products made from trees decompose in landfills. Indeed, land use changes—primarily deforestation—accounted for an estimated one third of global carbon emissions between 1850 and 1998.⁹ Trees also regulate global water flows among land, the atmosphere, rivers, lakes, and oceans.

At a local level, forests provide a long list of environmental and economic services. They are home to a tremendously broad range of species, for example. Indonesia accounts for only 1.3 percent of Earth's land surface, but it has 11 percent of the world's plant species, 10 percent of the mammal species, and 16 percent of the bird species.¹⁰ And in Brazil, deforestation is occurring at the greatest clip in areas that hold the key to species conservation in the Amazon. One of these areas has disappeared, and five others have lost half of their forest cover.¹¹

Less tree cover can also reduce rainfall, since trees transpire moisture into the air, which later falls as precipitation.¹² Researchers in Colombia, one of the most water-rich countries in the world, estimate that by 2025 some 70 percent of the country's people will experience water shortages in times of drought, partly because deforestation has increased flooding and reduced the land's capacity to retain water.¹³ The 2004 devastating flooding in Haiti was blamed in part on denuded hillsides, which were unable to hold water because roots that once held soil in place were no longer there.¹⁴

Deforestation is a complex phenomenon with many direct and underlying causes.¹⁵ Immediate drivers include agricultural expansion, wood harvesting, and infrastructure expansion such as road building. Underlying drivers include poverty, economic growth, and other economic factors; government policies; technological advances; demographic change; and cultural factors. Other variables, such as land characteristics and soil and water profiles, along with social triggers such as war can also

influence the extent of deforestation.

A 2001 analysis of 152 case studies of tropical deforestation dating back as far as 1880 challenged two prominent schools of thought about deforestation: that it typically has a single cause, such as shifting cultivation or population growth and, alternatively, that it is so complex that no clear causal patterns can be identified.¹⁶ The analysis found several commonly occurring combinations of drivers of tropical forest loss.

Agricultural expansion was the most common explanation for deforestation in the study, appearing in 96 percent of cases.¹⁷ But it was rarely the sole explanation. (Indeed, single-factor explanations of forest loss were found in only 6 percent of cases.)¹⁸ Agricultural expansion was linked with wood harvesting and infrastructure expansion—especially road and railroad construction, but also settlement expansion and the establishment of mines, oil wells, and dams—in 25 percent of the analyzed cases.¹⁹ Combinations of two of these three factors appeared in another 36 percent of cases.²⁰

Regarding underlying causes, the study found that the nexus of agriculture, wood harvesting, and road building was often driven by a combination of economic, policy, institutional, and cultural factors. Deforestation caused directly by agricultural expansion and wood harvesting was often driven by new technologies. And agricultural expansion was often driven by population growth.²¹

The analysis also found that cultural factors play a larger role in deforestation than is commonly believed and that these continue to be important. In Indonesia, for example, logging is tied closely to political cronyism. In the late 1990s, President Suharto awarded logging concessions covering more than half of the country's forested area; some 45 percent of these are in the hands of just 10 companies.²² And much of the supply of wood—an estimated 65 percent in 2000—is cut illegally.²³

As the world has become more crowded and as wood, paper, and other forest resources are in greater demand, forest governance is changing. Already, some 22 percent of the world's forests are privately owned.²⁴ And community

ownership now accounts for 11 percent of forests, a category that is projected to reach 40 percent by 2050.²⁵

Certification schemes, which offer consumers assurances that wood products come from forests that are managed sustainably, are increasing in number worldwide, although reports of certified area differ substantially. The Forest Stewardship Council (FSC) reports that certified area—area that meets internationally recognized criteria and principles of forest stewardship—has grown more than tenfold since 1995, to some 47 million hectares in 60 countries.²⁶ (See Table 1 for the top 10 countries with FSC-certified forests.) In 2000, FAO counted some 80 million hectares, about 2 percent of the world's forested area, as certified.²⁷ The World Bank and the World Wide Fund for Nature joined forces and hoped to increase this number to 200 million hectares by 2005.²⁸

Table 1. Top 10 FSC-Certified Areas, by Country

Country	Area (million hectares)
Sweden	10.10
Poland	6.20
United States	5.34
Canada	4.37
Brazil	2.63
Russia	2.12
Croatia	1.99
Latvia	1.69
South Africa	1.67
United Kingdom	1.21

Source: Forest Stewardship Council.

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