

DRIVERS OF DEFORESTATION

What Is Driving Deforestation Today?



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Humans have been cutting down forests for thousands of years, practically since they invented agriculture. Although forests themselves can be a source of many kinds of foods and useful products, fundamentally forests and agriculture are in conflict since, in many parts of the world, trees must be cleared to grow crops or graze livestock.

Until recently, deforestation has only been a local or regional concern, but today we live in a globalized world in which the forests of Central and South America, Southeast Asia, and Africa are connected economically to consumers around the world. Growing global demand for agricultural commodities has led to increased tropical deforestation, which not only affects biodiversity and the livelihood of forest peoples but also contributes to global warming.

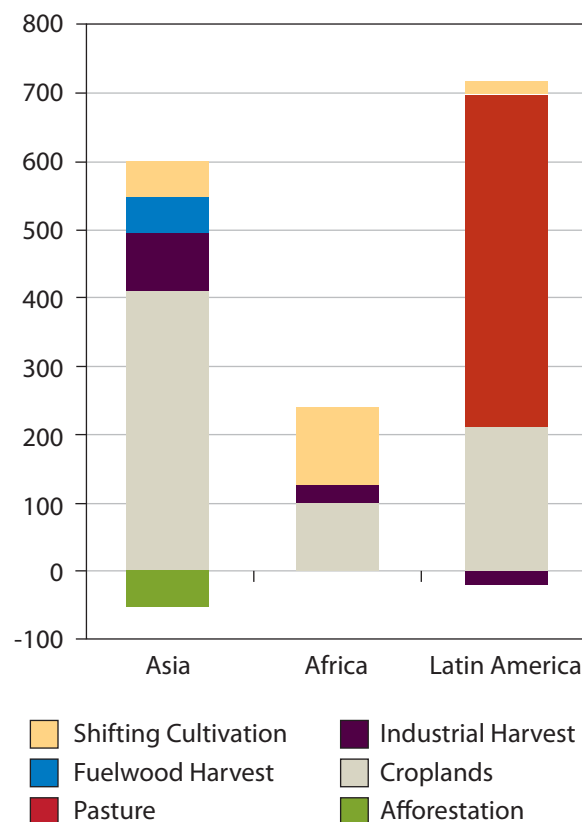
Trees contain enormous amounts of carbon—about 50 percent of their total weight. When trees are cut down, much of that carbon is released into the atmosphere as heat-trapping carbon dioxide. Because the amount of carbon stored in an acre of tropical rain forest is so high, tropical deforestation today causes about 15 percent of global warming pollution worldwide.

Satellite imagery (accessible through programs like Google Earth) allows us to see this forest clearing as never before. These pictures, when carefully compared and analyzed, show us where and when forests are disappearing, making it possible to understand and address the factors driving tropical deforestation.

The Principal Agents of Tropical Deforestation

For many years, tropical deforestation was attributed to expanding populations of subsistence farmers cutting down forestland for small-scale agriculture and firewood. However, many recent scientific studies show that large, commercial agriculture and timber enterprises are now the leading drivers of tropical deforestation.

Sources of Carbon Emissions from Deforestation and Degradation in Tropical Regions



Carbon emissions from tropical deforestation and forest degradation in Asia, Africa, and Latin America averaged over the period 1990–2005. “Croplands” includes soy in Latin America and oil palm in Asia. Most timber harvesting in Asia is included in “Industrial Harvest.” Units are billions of tons of carbon per year.

Source: Houghton 2010.

Cattle

Growing cattle to produce food for humans requires large amounts of land to generate relatively small amounts of food. Indeed, cattle pastures make up 70 percent of global agricultural land yet only provide about 6 to 11 percent of humanity’s food.

Brazil is the largest beef exporter in the world, and a fourth of Brazil’s beef production comes from the Amazon on land that was once part of the tropical forest. Brazilian cattle

ranches have been expanding northward in the Amazon because the land is cheaper there. With the clearing of forest increasing the value of the land five- to ten-fold, cattle ranching in the Amazon can be profitable even though productivity (pounds of meat per acre of land per year) is often very low.

In July 2009, due to mounting pressure from environmental and social non-governmental organizations in Brazil, the country's major slaughterhouses and distributors announced they would refuse to buy cattle from any ranch that expanded its pasture at the expense of the forest. It is too soon to tell what difference this moratorium will have on deforestation rates, but a similar moratorium on soy expansion in the Amazon has proven successful. Another way to reduce future pasture expansion is to increase the productivity of cattle per acre through improvements such as higher stocking rates, rotational grazing, and breeds better adapted to tropical conditions.

Timber and Paper

The global market for wood and wood products creates pressure on tropical countries to clear their forests to produce timber and pulp (which is used to make paper). This demand has increased logging of tropical forests and is a major driver of deforestation. If the demand for furniture, paper, building materials, and other wood products continues to increase, tropical forests will likely remain at risk for logging.

Wood products are connected to other drivers of deforestation because timber sales can provide the money



Wood can be used to produce timber or pulp, which is used to make paper

that is used to develop a new agricultural business or timber plantation. Furthermore, logging roads provide access to previously unreachable areas for clearing.

Currently, tropical logging produces only a small portion of the world's wood and paper products. However, it is likely that greater production in the future will come from developing tropical countries, since costs are lower in developing nations and tropical climates are suitable for fast-growing trees.

Compared with other regions, logging is a larger driver of deforestation in Southeast Asia. One reason is the high density of commercially valuable species there, making wholesale logging much more profitable than in other parts of the world. Indonesia is the leading example of how powerful timber and pulp companies and illegal

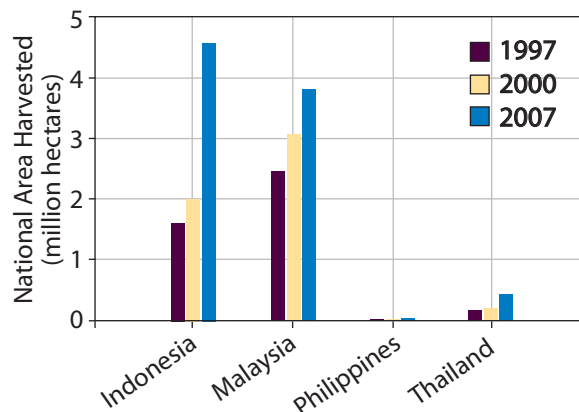
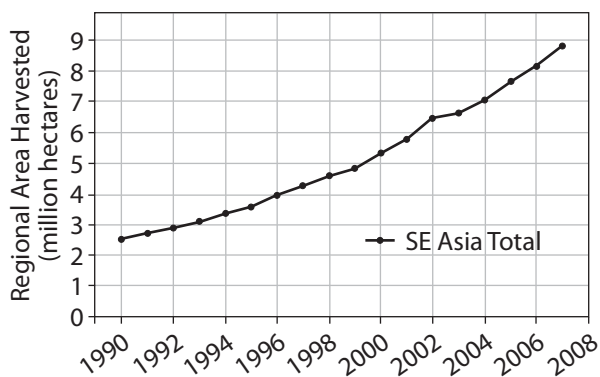
logging have caused deforestation.

In order to meet global demand for wood and paper products, it will be important to develop sustainable solutions. To ensure that production does not lead to further destruction of primary (i.e., old-growth) forests, wood products should come from either secondary forests (i.e., those that have regrown after agriculture or timber harvesting) or plantations, and the growth rate of demand should be slowed through practices such as increased recycling and reuse of timber and pulp products.

Palm Oil

Palm oil production has more than doubled in the last decade, and it now dominates the global market for vegetable-based oil. Most palm oil is produced on large industrial plantations,

The Rapid Growth in Area Harvested for Palm Oil, 1990–2007



Note that oil palm trees take several years to grow to harvestable size, so these data lag three or four years behind the data for area planted and even further behind those for area cleared for plantations.

Source: FAO 2011.

driving tropical deforestation in Indonesia and Malaysia. The land area harvested for palm oil in Southeast Asia has tripled in just a decade. To a much lesser extent, palm oil production also occurs in a few South Asian, South American, and West African countries but as demand for palm oil grows, deforestation could increase in these regions as well.

Though palm oil plantations represent a limited proportion of global deforestation in terms of area, they are a disproportionately large source of global warming emissions because they are often established on land converted from swamp forests. When these wetlands are drained, their carbon-rich peat soils decay, releasing large amounts of both carbon dioxide and methane, a potent heat-trapping gas. Thus the expansion of plantations onto peat soils is an important source of the emissions that cause global warming.

Cultivated palm trees produce a high yield of oil per hectare and can be grown on land that is not suitable for other crops. Fortunately, it is possible to reduce much of the emissions and deforestation associated with existing palm oil production and eliminate them completely from future production

Palm oil production has more than doubled in the last decade, and it now dominates the market for vegetable-based oil globally. Most palm oil is produced by large industrial plantations, driving tropical deforestation in Indonesia and Malaysia.

without much disruption to the global palm oil supply. This can be done by using degraded lands—such as the many cleared areas that have been overgrown by cogon grass (*Imperata cylindrica*), an invasive species—for palm oil plantations rather than by clearing new forest.

Diminishing Threats *Small-Scale Farming*

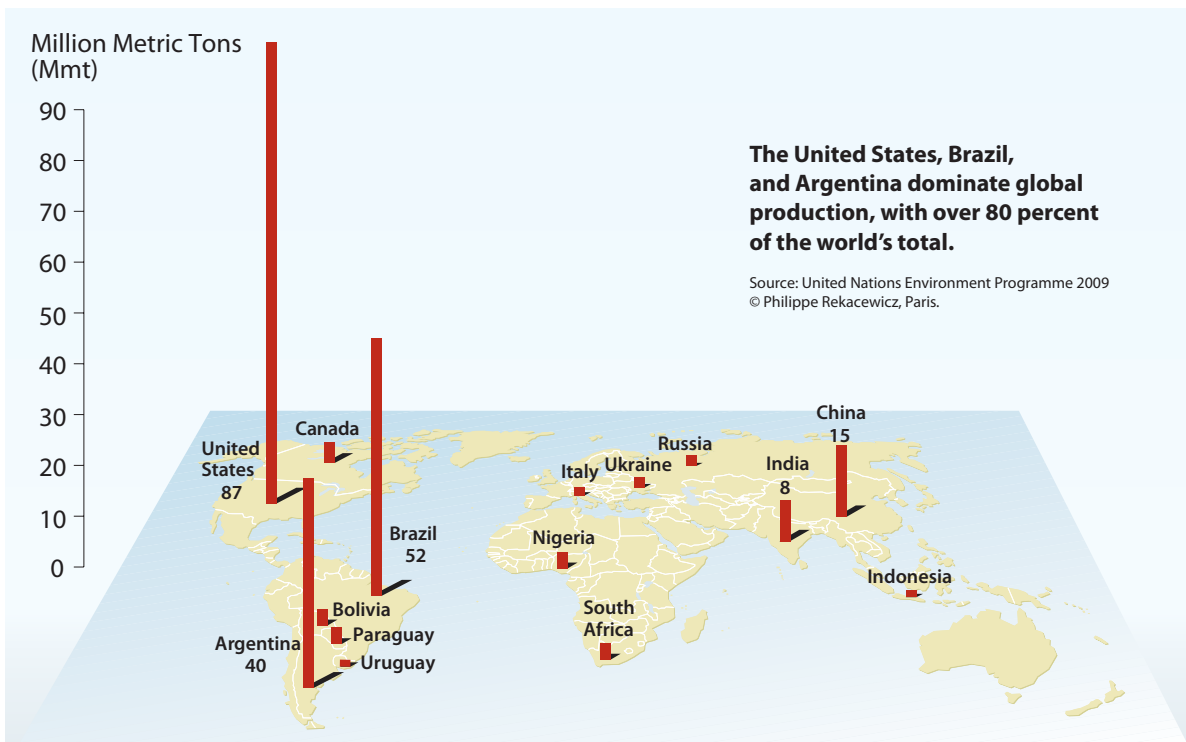
Throughout the world there are about 70 million people living in remote tropical forests and about 800 million rural people living in or near tropical forests and savannas. Tropical forests are important for the livelihoods of many communities and indigenous peoples as a source of food, income,

fuel, medicine, and land for farming—which can lead to replacing forests with small-scale agricultural fields.

Historically, small farmers, particularly shifting cultivators (sometimes referred to as “slash and burn” farmers), have been seen as the chief agents of deforestation in the tropics. However, recent data indicate that they do not cause the majority of deforestation globally. This is particularly the case in those tropical areas with the most deforestation, where large commercial enterprises are the major drivers. These commercial enterprises are linked to urban markets and global demand for agricultural commodities, unlike subsistence farmers.

Migration to cities and urban population growth, and subsequent urban demand for agricultural products, has been shown to be related to increasing tropical deforestation around the globe. Most subsistence farmers and small farmers living in rural areas are not strongly connected to international agricultural markets. While small farming operations still play a role in deforestation in the Amazon and Southeast Asia, large-scale commercial enterprises are now the main drivers of deforestation there.

Map of Soybean Production by Country, 2006



Wood for Fuel

Although most of the developed world now gets the majority of its energy for cooking and heating from fossil fuels like coal and petroleum, wood fuels are still a major source of energy for people in developing countries, comprising between 50 and 90 percent of the fuel used.

Firewood, while important as a fuel, has much less of a role as a driver of deforestation. Much of the material collected is already dead, and collection rates are often below regeneration rates. Small branches and shrubs, not large trees, are much easier to carry back for firewood. Furthermore, a substantial amount of firewood comes from trees and shrubs that are not in forests, but rather in and beside fields and pastures. However, in Africa the importance of local actions like wood fuel collection in relation to land use change is relatively higher because large-scale industrial drivers are not yet a major presence in the region.

Unlike firewood, charcoal usually comes from trunks or large limbs and requires cutting trees. While charcoal may not always be the primary driver of deforestation, it can contribute significantly to degradation and destruction of forests that have already been disturbed, particularly close to urban areas where charcoal is more commonly used. More efficient and sustainable methods are needed to prevent charcoal production from resulting in deforestation.

Soybeans

Over the past two decades soybean cultivation in the Amazon by large, commercial farmers has undergone a dramatic transformation. In just a few years, it grew to become one of the main causes of Amazon deforestation.



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However, in an even shorter period, the strong response of civil society resulted in a voluntary moratorium on soy expansion into forests, reducing its role as a driver of deforestation. Now that the Brazilian soybean moratorium has been in place for nearly five years, it is possible for scientists to evaluate its effectiveness, and the data show that it has been remarkably successful. Soybean production continues to grow, but no longer at the expense of the planet's largest rain forest.

Currently, the United States and Brazil each produce just under a third of the world's soybeans, with Argentina adding an additional fifth. These three countries make up 80 percent of world production, and overwhelmingly dominate the world soybean trade. As demand grows, if soybean production is prevented from expanding into new Amazon forestland in Brazil (and in Bolivia's Santa Cruz region, which

accounts for about 0.7 percent of world production), production is likely to shift to non-forest areas of the United States, to Argentina, and elsewhere in Brazil. China, which currently produces only 7 percent of the world's soybeans but is a major importer for its growing livestock industry, may also produce more if Brazilian export growth slows.

The success story of soy shows how a rapidly expanding agricultural export industry can continue growing without deforestation. Through a combination of yield increases and use of other lands, the need to clear forestland can be eliminated. The case is also instructive because it shows how industry can be influenced by societal pressure to commit to zero deforestation, and to set up an effective technology-based system to enforce it. While the moratorium is not yet permanent, with every year that it continues it reinforces the message that development without deforestation is possible, desirable, and even profitable.

Development without Deforestation

With various commodities driving deforestation across the planet, and a larger and increasingly connected global market driving the demand, it is more important than ever that these drivers of deforestation be addressed with global solutions. What is driving deforestation in one region could easily move to another region if there is not a change in demand and/or production practices (such as making smarter land use choices and improving agricultural methods). By reducing waste at all stages of production, distribution, and consumption, agriculture and forestry can truly meet human needs rather than simply consumer desires.



This fact sheet is adapted from *The Root of the Problem*, a fully referenced, comprehensive analysis of the drivers behind tropical deforestation. To learn more about these drivers, and to read the report, visit the UCS website at www.ucsusa.org/whatsdrivingdeforestation.

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