“a brilliant and powerful book”
Matt Ridley
author of Genome

the skeptical environmentalist
Measuring the Real State of the World

Bjørn Lomborg
10  Forests – are we losing them?

The forests are another form of renewable resource we may be overexploiting. Many people have a strong feeling that the forests are simply disappearing. A *Time* magazine environmental survey carried the headline: “Forests: the global chainsaw massacre.”760 The World Resources Institute simply calls it: “Deforestation: the global assault continues.”761 The WWF has disseminated a similar message on its website. The forest front page that greeted the visitor until April 1998 can be seen in Figure 59. “We must ACT NOW to preserve the last remaining forests on Earth,” it says. Elsewhere, WWF claims that, “The world’s forests are disappearing at an alarming rate.”762 This is in keeping with a statement by the WWF’s international president Claude Martin, who in 1997 called a press conference named Eleventh Hour for World’s Forests. Here he said: “I implore the leaders of the world to pledge to save their country’s remaining forests now – at the eleventh hour for the world’s forests.”763 Equally, he claimed that “the area and quality of the world’s forests have continued to decline at a rapid rate.”764 Worldwatch Institute even claims that “deforestation has been accelerating in the last 30 years.”765 But there are no grounds for making such claims. Globally, the overall area covered by forest has not changed much since 1950, as can be seen in Figure 60.766 Estimates of the possible future for global forests for the

![Figure 59](http://www.panda.org/forests4life/forests4life.htm)
rest of the century is depicted in Figure 150, p. 283, where the very pessimistic estimates show a 20 percent decline, but most scenarios show a constant or even somewhat increasing forest area till 2100.

Of course, it is difficult to determine what actually constitutes forest, because there is a gradual transition from dense rainforest to savanna to bush steppe, in the same way as trees become less tall and stand further apart as one approaches the tree line. It is also extremely difficult to compare Brazilian rainforest with Danish beech woodland or an American plantation. If we nevertheless want to attempt such a comparison, Figure 60 contains the best information on the global forest area. It is, however, important to stress that it only provides a general impression of the situation.

Globally, forest cover has remained remarkably stable over the second half of the twentieth century. With the longest data series, global forest cover increased from 30.04 percent of the global land area in 1950 to 30.89 percent in 1994, or an increase of 0.85 percent points over 44 years. With the somewhat shorter data series from 1961, global forest cover is estimated to have fallen from 32.66 percent to 32.22 percent. That is to say, it has fallen by 0.44 percentage points over the last 35 years or so. The UN carried out two global forest surveys in 1995 and 1997 and evaluated a more limited definition of forest area for the period 1980–90 and 1990–5. The survey found that the area covered by forest had shrunk from 27.15 percent to 25.8 percent, or by 1.35 percentage points, although these figures are vitiated by considerable uncertainty. For example, an upwards revision of the 1990 forest area was larger than the entire global decline in 1990–5 (or to put it differently – had the 1990 forest area not been revised, the period 1990–5 would have seen an increase in forested area). Moreover, Russia, which has the world’s largest forest cover, was not included in the survey. Thus, with these considerable short-term uncertainties it seems necessary to focus on the longest possible time periods. Those interested are referred to a
longer discussion in the footnotes. In the newest forest study from 2001, the FAO has changed the definitions of forest once again and made a new estimate of forested area from 1990-2000, showing a small decline from 29.5 to 28.8 percent. Most forest by far is concentrated in a few countries. Russia, Brazil, the US and Canada together have more than 50 percent of the world’s forest. Globally there is about two to three times as much forests as cropland.

**Forests and history**

Since beginning farming, man has been felling woodland to get more land for cultivation. Plato wrote of the Attica heights outside Athens that they resembled “the skeleton of a body wasted by disease” as a result of deforestation.

Europe has lost 50–70 percent of its original forest. Much of the continent’s forest was felled in the early Middle Ages, to provide either more agricultural land or firewood. Half of France’s forest disappeared between 1000 and 1300. The Black Death wiped out one-third of Europe’s population in the middle of the fourteenth century, relieving pressure on the forests, which in many cases grew back again. It was not until the 1500s and 1600s that an ever increasing number of people again put the forests under pressure, and more large areas of it were felled. By 1700, France’s forests had been reduced in size by more than 70 percent compared to 1000 CE. In the eighteenth century, however, people became aware of the fact that the forests were a limited resource and that they were important for naval shipbuilding purposes. For this reason forest area in Europe only fell by about 8 percent from 1700 onward.

The US has only lost approximately 30 percent of its original forest area, most of this happening in the nineteenth century. The loss has not been higher mainly because population pressure has never been as great there as in Europe. The doubling of US farmland from 1880 to 1920 happened almost without affecting the total forest area as most was converted from grasslands.

On the other hand, many other regions of the world experienced increased deforestation in the nineteenth century. Latin America became part of the world economy at an early stage and has cleared approximately 20 percent of its forest cover over the last 300 years. Much of it went to make way for sugar and later coffee although a gold and diamond fever, which started in 1690, also helped to clear approximately 2 percent of the forest in Brazil.

Asia, which has long had intensive farming, joined the world economy relatively late. It was not until the American Civil War and the opening of the Suez Canal in 1869 that India began to export cotton on a large scale. All in all, southern Asia and China have lost about 50 percent of their forest cover since 1700. Southeast Asia, on the other hand, has only lost 7 percent over the last 300 years, while Africa and Russia have each lost a little under 20 percent.

Globally it is estimated that we have lost a total of about 20 percent of the original forest cover since the dawn of agriculture. This figure is far smaller than the one so often bandied about by the various organizations. The WWF, for example, claims that we have lost two-thirds of all forests since agriculture was introduced, as mentioned in the introduction, although there is no evidence to support this claim.

**Deforestation: a general view**

The forests have many advantages to offer. The most obvious of these come from an estimated 5,000 commercial products, mainly construction timber, furniture, paper and firewood. It is estimated that, at the global level, forestry contributes some 2 percent of world GDP, or more than US$600 billion.
In addition to this, the forests offer recreation for urban-dwellers, they help to prevent soil erosion, which silts up rivers and reservoirs, and they reduce flooding. Finally, the forest is home to many species of animals, especially the rainforest, as will be discussed in the section on biodiversity.

The temperate forests, most of which are in North America, Europe and Russia, have expanded over the last 40 years. On the other hand, quite a lot of tropical forest is disappearing. Tropical forests are home to by far the majority of animal and plant species and by far the largest biomass on the planet. In the tropical rainforest, which is the wet part of the tropical forest, one will often find several hundred species of tree within just a few hundred square kilometers. This is in stark contrast to the boreal forests – in Canada’s more than 1,000 square kilometers of boreal forest there are only about 20 different tree species.

In the late 1970s it was feared that half or more of the rainforests would disappear within the next few decades. President Carter’s environment report, Global 2000, estimated an annual tropical forest loss of between 2.3 percent and 4.8 percent. The well-known biologist Norman Myers estimated as recently as the early nineties that 2 percent of all forest was being destroyed every year and believed that by the year 2000 – in just nine years at the time of his prediction – we would have lost about a third of the tropical forest area. Actually, he claimed that “in just another few decades, we could witness the virtual elimination of tropical forests.” Estimates in the same range of 1.5–2 percent were common among biologists. Today we know that these estimates went way over the mark. The usual FAO estimates put net deforestation in the tropics in the 1980s at 0.8 percent a year, falling to 0.7 percent in the 1990s. With FAO’s new 2001-study, based on accurate satellite imagery, the estimate of the net tropical deforestation has declined even further to 0.46 percent.

These figures are still high though, and there are three main reasons for this. For one thing, the tropical forests often have either no or poorly administered property rights. In reality, the problem resembles the situation of world fishing, described earlier. If the rainforest is everybody’s property, it will be nobody’s responsibility. Pioneers will simply clear an area, try to farm it and probably ruin the soil in the course of a few years before moving on to a new area. Often the problem of poor regulation is not tackled politically, because the alternative for the local government is an increasing number of poor and unemployed citizens – and therefore more potential political unrest – in the big cities.

For another thing, the tropical forests are extremely valuable in terms of the timber they provide. Trade with large lumber companies is often a quick and easy way out for economically distressed developing nations. In Surinam, timber conglomerates have offered the country investments of a size similar to its GDP for the right to log trees in one-third of the country’s forests. With inflation at 500 percent and unemployment on the increase, an offer like this can be almost irresistible. The cost in the first instance would be borne by the small population of Indians who live in the forests. In the long term, though, they are selling the family silver. Over time, Surinam would be able to administer its forests much better and get much more for the produce they offer if the country were under less economic pressure.

Finally, collecting fuelwood is a major reason for deforestation in the developing world. Although wood only provides 1 percent of the world’s energy, it accounts for 25 percent of the energy consumption in the developing world as a whole and as much as 50 percent in Africa. Used primarily for cooking and heating, the wood is gathered by the poorest families, who cannot afford other and cleaner fuels such as kerosene. This contributes to local deforestation and desertification. In many African cities, there is no firewood to be found within a radius of 50 kilometers, and
women and children spend between 100 and 300 days a year just scavenging for it.\textsuperscript{805} There are many quick-growing alternatives to ordinary wood which could be planted in selected areas with poor soil to provide fuel. Also, the traditional three-stone fire only exploits about 6 percent of the energy emitted, whereas cheap metal stoves can double the efficiency and locally made ceramic stoves quadruple the efficiency, reducing indoor pollution and saving up to 20 percent on household fuel costs.\textsuperscript{806}

All the three above problems of deforestation can be characterized as bad management. The three causes actually have their roots in other problems faced by the developing world. Unregulated deforestation is largely due to the presence of large groups of poor and landless, and overexploitation of wood fuel is basically due to low income.\textsuperscript{807} At the heart of both problems lies the task of reducing poverty and achieving increased growth.

Similarly, the lumber problem frequently arises because countries are caught in a debt trap and are forced to think short-term and thus more easily fall victim to bad deals.\textsuperscript{808} If the industrialized countries want to focus on tropical deforestation, then they should pay the developing countries for the preservation of the forests. This happened in the first debt-for-nature swap in Bolivia, where an American bank consortium purchased part of Bolivia's national debt in return for a promise that 1.5 million hectares of tropical forest were converted to a biological reserve. Unfortunately, Bolivia did not keep its promise, and the area is still not legally protected.\textsuperscript{809} The idea has, however, been adopted by Ecuador, Costa Rica and the Philippines.\textsuperscript{810} Most analysts basically agree that tropical timber can be harvested in a biologically viable fashion, but that stricter rules need to apply.\textsuperscript{811}

**Deforestation: how much?**

However, in order to evaluate the entire extent of this problem, it is necessary to look at how much tropical forest has actually disappeared. Although precise figures are not available, the Conservation Union World, the IUCN, estimates that 80 percent of the original forest cover is still in place. Within historical times, then, just about 20 percent of all tropical forests has disappeared.\textsuperscript{812} Compared with the developed world, where we have cleared almost half of our forest, this is a relatively small figure.

Countries such as Nigeria and Madagascar have admittedly lost well over half their original rainforest, and Central America may have lost 50–70 percent.\textsuperscript{813} But overall, they are only home to about 5 percent of the world's tropical forest. Most of it by far is in the Brazilian Amazon.\textsuperscript{814} The Brazilian forests make up a third of the world's tropical forest. In comparison, Indonesia – the second largest tropical forest area – “only” has 6 percent of the global total.

In 1988, scientists at Brazil's space agency (INPE) announced that its satellites had located as many as 7,000 fires, and that Brazil was now cutting down 8 million hectares of its forests – some 2 percent – a year.\textsuperscript{815} These figures attracted extensive criticism of Brazil for its destruction of irreplaceable nature. It later transpired, however, that these figures had been grossly overstated, and the official preliminary estimate for 1999 was about 1.7 million hectares a year, or just below 0.5 percent a year. In actual fact, overall Amazonian deforestation has only been about 14 percent since man arrived, as can be seen in Figure 61.\textsuperscript{816} At least some 3 percent of this 14 percent has since been replaced by new forest.\textsuperscript{817}

Obviously, Figure 61 doesn’t look that bad. There is in fact reason to believe that 70 percent of the Amazon forest will remain intact, and in April 1998 the Brazilian government promised that protection orders would be slapped on a further 25 million hectares.\textsuperscript{818}

The WWF, however, told us in 1996 that deforestation had increased by 34 percent since 1992. They did not tell us a year later
The other argument in favor of preserving the forests is to conserve the globe’s profusion of species, or the biodiversity. We will look into this argument in chapter 23. In short it can be said that over the next 50 years we will not lose 50 percent of all species as claimed by many, but more like 0.7 percent. One cannot generally argue that these species constitute an actual economic resource (along the lines that they may constitute new and potentially vital medicines) but we may well hold moral reasons for their preservation.

At the same time, numerous false impressions exist regarding the condition of our forests. Most people believe that over the last 50 years we have wiped out large swathes of rainforest, and perhaps temperate forest as well. Statements such as the one from the WWF quoted above naturally help to cement this idea. But as we have pointed out, there has not been a fall in global forest area during this period. On the other hand, Europe got rid of a large proportion of its forest by the end of the Middle Ages in order to make room for farming and bigger populations.

Many people also worry that our paper consumption and the use of printed advertising is laying the forests to waste. The Worldwatch Institute wrote in 1998 that “the dramatically increasing demand for paper and other wood products . . . [is] turning local forest destruction into a global catastrophe.” But in actual fact, our entire consumption of wood and paper can be catered for by the tree growth of just 5 percent of the current forest area.

Similarly, many allege that although forest cover has remained constant, this is because we have less natural forest and more plantations. The old natural forest has a wealth of species, while plantations consist of genetically identical trees which support very few other plant and animal species. This, of course, is an offshoot from the general biodiversity argument. But for one thing it is not obvious that plantations reduce overall biodiversity. Certainly, they do have fewer species locally, but precisely because the purpose of

How much forest?

If a considered political decision is to be made about how much forest we want to have in the world, it is crucial for us to have a comprehensive view of the arguments for and against exploitation of the forests.

There are two primary reasons for viewing the tropical forests as a vital resource. In the 1970s we were told that rainforests were the lungs of the Earth. Even in July 2000, WWF argued for saving the Brazilian Amazon since “the Amazon region has been called the lungs of the world.” But this is a myth. True enough, plants produce oxygen by means of photosynthesis, but when they die and decompose, precisely the same amount of oxygen is consumed. Therefore, forests in equilibrium (where trees grow but old trees fall over, keeping the total biomass approximately constant) neither produce nor consume oxygen in net terms. Even if all plants, on land as well as at sea, were killed off and then decomposed, the process would consume less than 1 percent of the atmosphere’s oxygen.
plantations is to produce masses of wood, they reduce the economic pressure on other natural forests. As a result, these forests are better shielded, can support higher biodiversity or become better recreational areas for humans. 825 60 percent of Argentina’s wood is produced in plantations which constitute just 2.2 percent of the total Argentinean forest area, thus relieving the other 97.8 percent of the forests. 826 For another thing, plantations are typically claimed to be huge. WWF states that plantations “make up large tracts of current forest area.” 827 Of course, words such as “large tracts” are vague, but according to the FAO, plantations make up just 3 percent of the world’s forest area. 828

Finally, we heard a great deal about the forest fires in Indonesia in 1997, which for months laid a thick layer of smog over all of Southeast Asia from Thailand to the Philippines. The fires constituted a genuine health problem and with a total cost of almost 2 percent of GDP had appreciable economic impact. 829 However, they were also exploited as a means to focus attention on deforestation. The WWF proclaimed 1997 as “the year the world caught fire” and their president, Claude Martin, stated unequivocally that “this is not just an emergency, it is a planetary disaster.” 830 Summing up, WWF maintained that, “in 1997, fire burned more forests than at any other time in history.” 831

This is not the case, however. In their report, the WWF estimated that the fires in Indonesia involved 2 million hectares, despite the fact that this is higher than any other estimate cited in the report. Although the 2 million hectares are mentioned constantly, it is only well into the text that it becomes apparent that the figure comprises both forest and “non-forest” areas. 832 The official Indonesian estimate was about 165,000–219,000 hectares. 833 Later, satellite-aided counting has indicated that upwards of 1.3 million hectares of forests and timber areas may have burnt. 834 The independent fire expert Johann Goldammer said that “there is no indication at all that 1997 was an extraordinary fire year for Indonesia or the world at large.” 835

The WWF also estimates that forest fires in Brazil are “on as great a scale as those in Indonesia,” but provide no references. 836 They state that the number of forest fires increased in 1997, although they do later tell us that the vast majority of fires involved land that had already been cleared. 837 The Brazil Environment Agency estimates that 94 percent of all fires are on land that has already been burnt, and Brazil’s Institute for Environmental Research in the Amazon estimates about 72 percent. 838

The WWF report fails to sum up the extent of the various other fires, typically about 5,000 hectares in Tanzania and 40,000 in Colombia.

Altogether, however, the WWF’s figures are nowhere near the 2.4–3.6 million hectares of forests that burned on just the Indonesian part of Borneo in 1983–4, and the figure is well below the 13 million hectares that burned in China and the former USSR in 1987. 839 In fact, it is estimated that fires each year burn some 10–15 million hectares of boreal and temperate forest, 20–40 million hectares of tropical forests, and up to 500 million hectares of tropical and subtropical savannas, woodlands and open forests. 840 Russian forest fires alone are estimated at about 12 million hectares each year. 841 In conclusion, 1997 was in no way the year in which fire burned more forests than at any other time in history.

What is more, the assessment of forest fires presents other problems. For one thing, only a small portion of the burned areas actually affects original forest. The WWF estimates that “only” approximately 100,000 hectares of primary forest were destroyed in 1997 – less than one-thousandth of the Indonesian forest area. 842 Most forest burning by far takes place on soil already exploited as part of the annual sugar cane harvest, in order to secure fields and grassland, and because it is believed to be good for the soil. 843

For another thing, fire has been utilized by man since time immemorial. Investigations
suggest that simultaneously with man’s arrival in Australia, the vegetation became fire-resistant. In global terms it is estimated that overall burning of biomass has only grown by 30 percent at the most since 1880, despite the rapid population increase and an associated increase in the use of slash-and-burn agriculture.

**Conclusion**

Generally speaking one has to ask what foundation we actually have for our indignation about tropical deforestation, considering our own deforestation of Europe and the US. It seems hypocritical to accept that we have benefited tremendously from felling large sections of our own forests but not to allow developing countries to harvest the same advantages.

However, we can still point to two facts. First, people in developing countries often exploit their forests in a short-term, unnecessarily injudicious fashion—a policy that will harm them in the long run. Exploitation is due both to individual poverty and to poor government finances. Both problems are really rooted in poor economic conditions, and solutions therefore need to include solid, economic growth, in order to ensure that, in future, developing countries will be able to afford the resources to establish a broader perspective on forest development.

Second, we ought to put our money where our mouths are, if we seriously mean what we say about our desire to inhibit the reduction of biodiversity. If we do not want the developing countries to exploit their forest reserves in the same way as we did ours, we should compensate them for it. This could be achieved in several ways. We have already mentioned debt-for-nature swaps, under which Western companies or nations redeem debts in return for the protection of significant natural areas. It would also be possible to achieve better protection of developing nations’ forests by implementing a global certification system. Briefly, this involves using a specific international label to inform consumers that timber products come from forests which are cultivated viably and responsibly. Again this solution involves linking problems to the market so as to make it profitable for developing countries to exploit their forests in a responsible fashion.

Basically, however, our forests are not under threat. In a historical perspective, about 20 percent of all forest has been lost, while about a third of the world’s land mass is still covered by forest, and since World War II this area has not changed much. Tropical forests are being deforested, though on levels much below the feared 1.5–4.6 percent per year—the newest data from the FAO indicate an annual rate of 0.46 percent. In developing countries, forests are sometimes managed in a thoughtless and irresponsible fashion, but the primary solution to this will be higher growth and a better economic foundation so as to secure the countries concerned the resources to think long-term. On moral grounds, we can aspire to reduce tropical deforestation with the aim of limiting the reduction in biodiversity, although we must also realize that biodiversity is being reduced to a much lesser extent than originally thought.

Finally, the world’s demand for paper can be permanently satisfied by the wood production of just 5 percent of the current forest cover. Plantations do not account for much of the overall forest area, and they actually help relieve pressure on natural forest, which still dominate more than 95 percent of the world’s forests.