

Key findings

Global Forest Resources Assessment 2010





Newest information and knowledge about the world's forests and forestry

FAO, in cooperation with its member countries, has monitored the world's forests at 5 to 10 year intervals since 1946. These global assessments provide valuable information to policy-makers in countries, to international negotiations, arrangements and organizations related to forests and to the general public. The Global Forest Resources Assessment 2010 (FRA 2010) covers all seven thematic elements of sustainable forest management:

- Extent of forest resources
- Forest biological diversity
- Forest health and vitality
- Productive functions of forest resources
- Protective functions of forest resources
- Socio-economic functions of forests
- Legal, policy and institutional framework

Information was also collected on trends in forest ownership and management.

Information collected and analysed from 233 countries and areas

FRA 2010 is the most comprehensive assessment to date. It examines the current status and recent trends for more than 90 variables and all types of forests in 233 countries and areas.

FAO worked closely with countries and forest assessment specialists in the design and implementation of FRA 2010. More than 900 contributors were involved, including 178 officially nominated national correspondents and their teams.



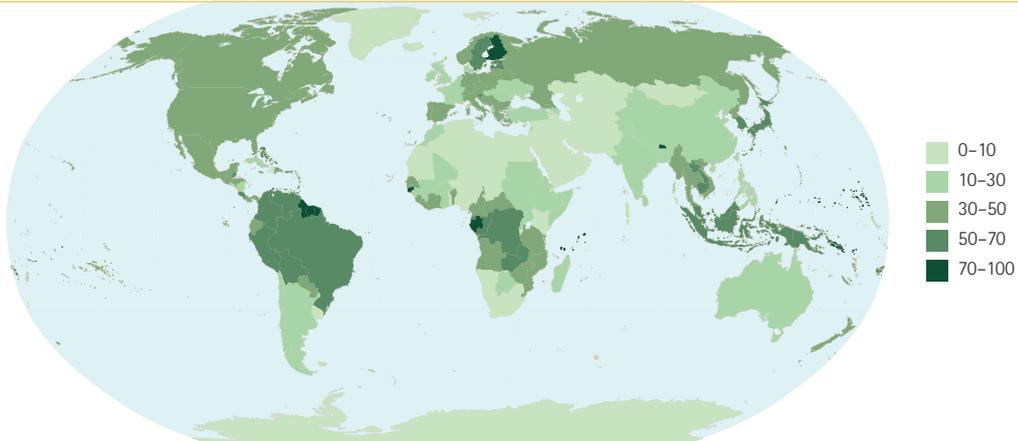


Extent of forest resources

Forests cover 31% of total land area

The world's total forest area is just over 4 billion hectares, which corresponds to an average of 0.6 ha per capita. The five most forest-rich countries (the Russian Federation, Brazil, Canada, the United States of America and China) account for more than half of the total forest area. Ten countries or areas have no forest at all and an additional 54 have forest on less than 10 percent of their total land area.

Forest area as percent of total land area by country, 2010



The rate of deforestation shows signs of decreasing – but is still alarmingly high

Deforestation – mainly the conversion of tropical forests to agricultural land – shows signs of decreasing in several countries but continues at a high rate in others. Around 13 million hectares of forest were converted to other uses or lost through natural causes each year in the last decade compared to 16 million hectares per year in the 1990s. Both Brazil and Indonesia, which had the highest net loss of forest in the 1990s, have significantly reduced their rate of loss, while in Australia, severe drought and forest fires have exacerbated the loss of forest since 2000.



Large-scale planting of trees is significantly reducing the net loss of forest area globally

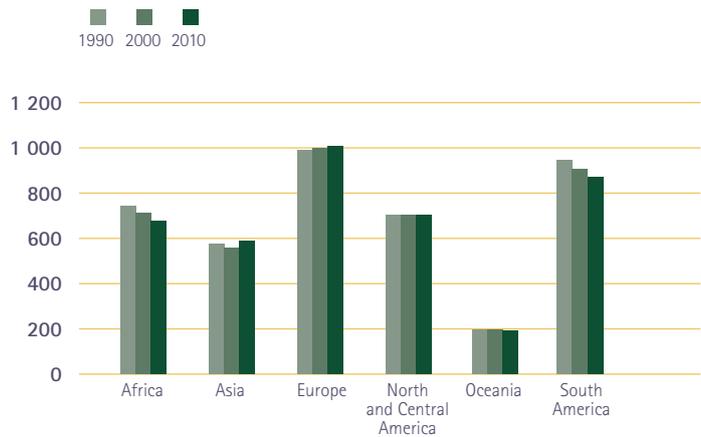
Afforestation and natural expansion of forests in some countries and regions have reduced the net loss of forest area significantly at the global level. The net change in forest area in the period 2000–2010 is estimated at –5.2 million hectares per year (an area about the size of Costa Rica), down from –8.3 million hectares per year in the period 1990–2000.



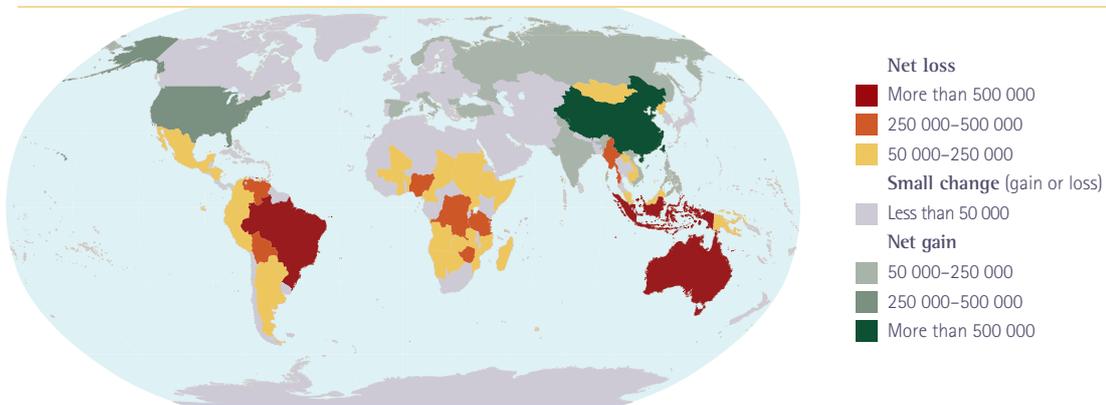
South America and Africa continue to have the largest net loss of forest

Oceania also reported a net loss of forest, while the area of forest in North and Central America was estimated as almost the same in 2010 as in 2000. The forest area in Europe continued to expand, although at a slower rate than in the 1990s. Asia, which had a net loss in the 1990s, reported a net gain of forest in the period 2000–2010, primarily due to the large-scale afforestation reported by China and despite continued high rates of net loss in many countries in South and Southeast Asia.

Trends in forest area, 1990–2010 (million ha)



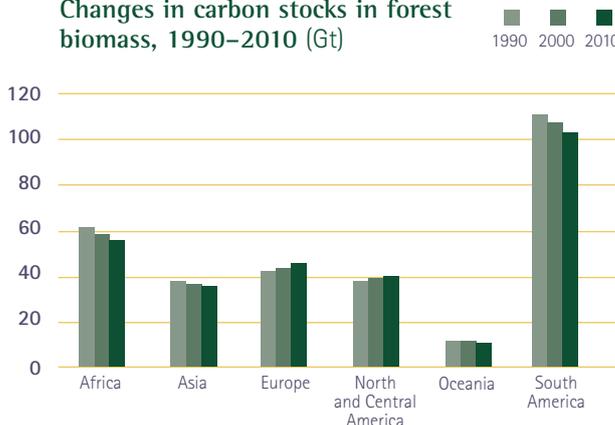
Net change in forest area by country, 2005–2010 (ha/year)



Previous figures underestimated global deforestation rate for the 1990s

FRA 2010, like FRA 2005, did not directly compile data on deforestation rates, because few countries have this information. In FRA 2005 the global deforestation rate was estimated from net changes in forest area. Additional information on afforestation and on natural expansion of forest for the past 20 years has now made it possible to also take into account deforestation within those countries that have had an overall net gain in forest area. As a result, the revised estimate of the global rate of deforestation and loss from natural causes for 1990–2000 (close to 16 million hectares per year) is higher, but more accurate, than was estimated in FRA 2005 (13 million hectares).

Changes in carbon stocks in forest biomass, 1990–2010 (Gt)



Forests store a vast amount of carbon

FRA 2010 estimates that the world's forests store 289 gigatonnes (Gt) of carbon in their biomass alone. While sustainable management, planting and rehabilitation of forests can conserve or increase forest carbon stocks, deforestation, degradation and poor forest management reduce them. For the world as a whole, carbon stocks in forest biomass decreased by an estimated 0.5 Gt annually during the period 2005–2010, mainly because of a reduction in the global forest area.



Primary forests account for 36% of forest area – but have decreased by more than 40 million hectares since 2000

On a global average, more than one-third of all forest is primary forest, i.e. forest of native species where there are no clearly visible indications of human activities and the ecological processes have not been significantly disturbed. Primary forests, in particular tropical moist forests, include the most species-rich, diverse terrestrial ecosystems. The decrease of primary forest area, 0.4 percent over a ten-year period, is largely due to reclassification of primary forest to "other naturally regenerated forest" because of selective logging and other human interventions.

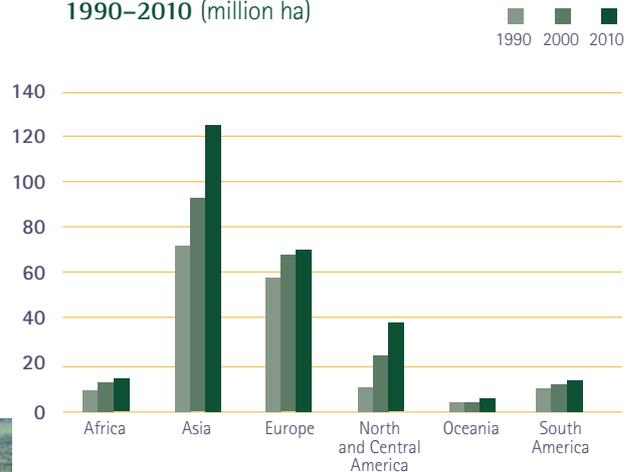
Characteristics of the world's forests, 2010 (%)



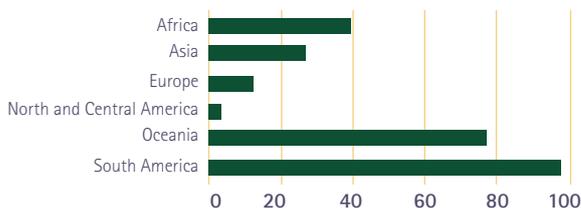
The area of planted forest is increasing – it now accounts for 7% of total forest area

Forests and trees are planted for many purposes and make up an estimated 7 percent of the total forest area, or 264 million hectares. During 2005–2010, the area of planted forest increased by about 5 million hectares per year. Most of this was established through afforestation, i.e. planting of areas not forested in recent times, particularly in China. Three-quarters of all planted forests consist of native species while one-quarter comprises introduced species.

Changes in area of planted forest, 1990–2010 (million ha)



Proportion of planted forests consisting of introduced species, 2010 (%)





Forest biological diversity

12% of the world's forests are designated for the conservation of biological diversity

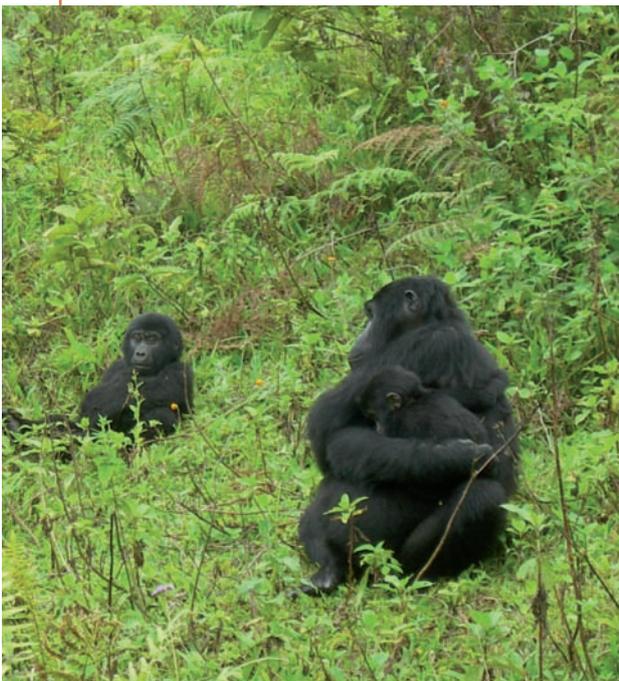
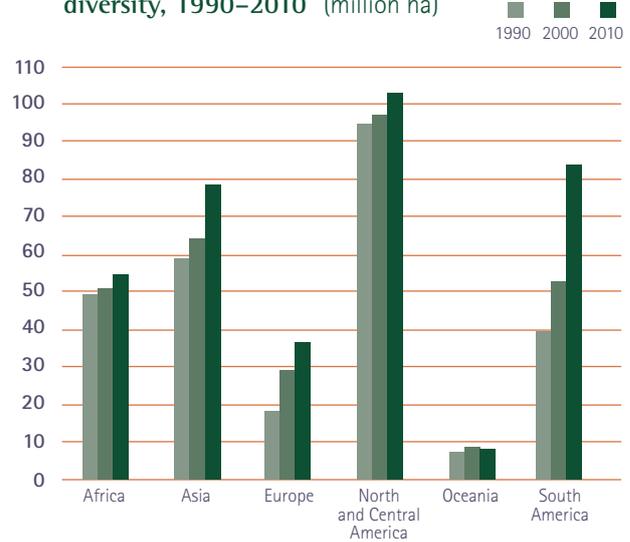
The area of forest where conservation of biological diversity is designated as the primary function has increased by more than 95 million hectares since 1990, of which the largest part (46 percent) was designated between 2000 and 2005. These forests now account for 12 percent of the total forest area or more than 460 million hectares. Most but not all of them are located inside protected areas.



A global remote sensing survey of forests will yield improved information on changes in the area of major forest types over time

Countries use differing frequencies, classification systems and assessment methods when monitoring their forests, making it difficult to obtain consistent data on major forest types that span national borders. FAO, in collaboration with countries and key partner organizations, is currently undertaking a global remote sensing survey – based on a systematic sampling of some 13 500 sites around the globe – to provide additional and more consistent information on deforestation, afforestation and natural expansion of forests at regional and biome levels for the period 1990–2005. Results are expected at the end of 2011.

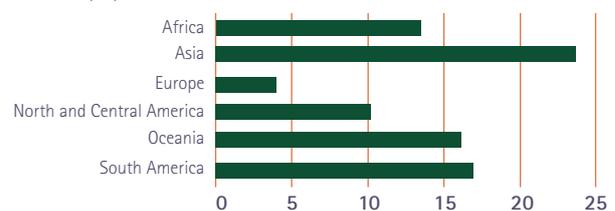
Forests designated for conservation of biological diversity, 1990–2010 (million ha)



Legally established protected areas cover an estimated 13% of the world's forests

National parks, game reserves, wilderness areas and other legally established protected areas cover more than 10 percent of the total forest area in most countries and regions. The primary function of these forests may be the conservation of biological diversity, the protection of soil and water resources, or the conservation of cultural heritage. The area of forest within a protected area system has increased by 94 million hectares since 1990. Two-thirds of this increase has been since 2000.

Proportion of forest area in legally protected areas, 2010 (%)





Forest health and vitality

Forest fires are severely underreported at the global level

While some forest ecosystems depend on fire for their regeneration, forest fires can be devastating to others and also frequently cause loss of property and human life. On average, 1 percent of all forests was reported to be significantly affected each year by forest fires. However, the area of forest affected by fires was severely underreported, with information missing from many countries, especially in Africa. Less than 10 percent of all forest fires are prescribed burning; the rest are classified as wildfires.



Pests and diseases, natural disasters and invasive species are causing severe damage in some countries

Outbreaks of forest insects pests damage some 35 million hectares of forest annually, primarily in the temperate and boreal zone. The mountain pine beetle has devastated more than 11 million hectares of forest in Canada and the western United States since the late 1990s – an unprecedented outbreak exacerbated by higher winter temperatures. Severe storms, blizzards and earthquakes have also damaged large areas of forest since 2000. Woody invasive species are of particular concern in small island developing States, where they threaten the habitat of endemic species. Information availability and quality continues to be poor for most of these disturbances.



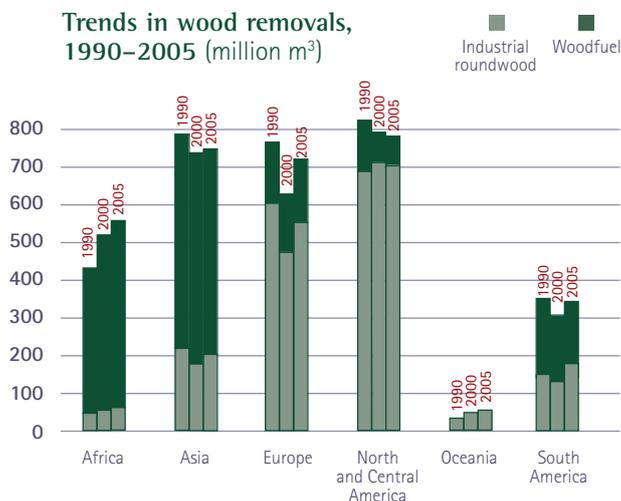
Productive functions of forest resources

30% of the world's forests are primarily used for production of wood and non-wood products

Close to 1.2 billion hectares of forest are managed primarily for the production of wood and non-wood forest products. An additional 949 million hectares (24 percent) are designated for multiple uses – in most cases including the production of wood and non-wood forest products. The area designated primarily for productive purposes has decreased by more than 50 million hectares since 1990 as forests have been designated for other purposes. The area designated for multiple uses has increased by 10 million hectares in the same period.



Trends in wood removals, 1990–2005 (million m³)



After a decrease in the 1990s, wood removals began to increase

At the global level, reported wood removals amounted to 3.4 billion cubic metres annually, similar to the volume recorded for 1990 and equivalent to 0.7 percent of the total growing stock. Considering that informally and illegally removed wood, especially woodfuel, is not usually recorded, the actual amount of wood removals is undoubtedly higher. At the global level, woodfuel accounted for about half of the removed wood.



Protective functions of forest resources

8% of the world's forests have soil and water conservation as their primary objective

Around 330 million hectares of forest are designated for soil and water conservation, avalanche control, sand dune stabilization, desertification control or coastal protection. The area of forest designated for protective functions increased by 59 million hectares between 1990 and 2010, primarily because of large-scale planting in China aimed at desertification control, conservation of soil and water resources and other protective purposes.



Socio-economic functions of forests



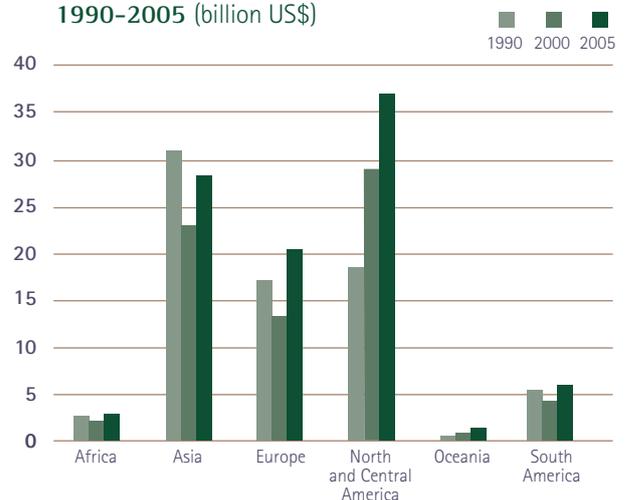
The management of forests for social and cultural functions is increasing, but the area is difficult to quantify

The only subregions and regions with fairly good data on the designation of forests for recreation, tourism, education or conservation of cultural and spiritual heritage are East Asia and Europe, where provision of such social services was reported as the primary management objective for 3 and 2 percent of the total forest area, respectively. Brazil has designated more than one-fifth of its forest area for the protection of the culture and way of life of forest-dependent people. Globally, 4 percent of the world's forests are designated for the provision of social services.

The value of wood removals is high but fluctuating

Wood removals valued just over US\$100 billion annually in the period 2003–2007, mainly accounted for by industrial roundwood. At the global level reported values show no change between 1990 and 2000, but an increase of about 5 percent annually over the period 2000–2005, suggesting that roundwood prices recovered somewhat since their decline (in real terms) in the decade 1990–2000. However, they have since fallen sharply.

Value of wood removals, 1990–2005 (billion US\$)





The value of non-wood forest products remains underestimated

The reported value of non-wood forest product removals amounts to about US\$18.5 billion for 2005. Food products account for the greatest share. However, information is still missing from many countries in which non-wood forest products are highly important, and the true value of subsistence use is rarely captured. As a result, the reported statistics probably cover only a fraction of the true total value of harvested non-wood forest products.



Around 10 million people are employed in forest management and conservation – but many more are directly dependent on forests for their livelihoods

Reported employment in forest establishment, management and use declined by about 10 percent between 1990 and 2005, probably because of gains in labour productivity. Europe, East Asia and North America saw steep declines (15 to 40 percent between 1990 and 2005), while in other regions, employment increased somewhat – probably because roundwood production has increased faster than gains in labour productivity. Most countries reported increased employment in management of protected areas. Given that much forestry employment is outside the formal sector, forest work is surely much more important for rural livelihoods and national economies than the reported figures suggest.

Governments generally spend more on forestry than they collect in revenue

On average, total forest revenue collection was about US\$4.5 per hectare, ranging from under US\$1 per hectare in Africa to just over US\$6 per hectare in Europe. Public expenditure on forestry was about US\$7.5 per hectare on average. Average expenditure was highest in Asia (over US\$20 per hectare). In contrast, the average expenditure per hectare was less than US\$1 in South America and Oceania.



Legal, policy and institutional framework

Significant progress has been made in developing forest policies, laws and national forest programmes

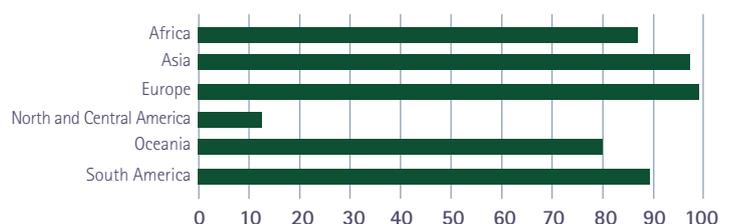
Of the 143 countries that have a forest policy statement, 76 countries have issued or updated their statements since 2000. Of the 156 countries that have a specific forest law, 69 countries – primarily in Europe and Africa – reported that their current forest law has been enacted or amended since 2005. Close to 75 percent of the world's forests are covered by a national forest programme, i.e. a participatory process for the development and implementation of forest-related policies and international commitments at the national level.

Staff in public forest institutions is decreasing

Around 1.3 million people were reported to work in public forest institutions – 22 percent of whom were female. At the global level, the number of staff has declined by 1.2 percent annually since 2000. More than 20 000 professionals work in public forest research institutions.

More than 60 000 university students graduate in forestry annually – one-third are female

Forest area covered by a national forest programme, 2010 (%)



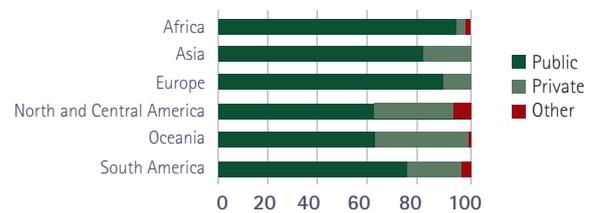


Ownership and management of the world's forests

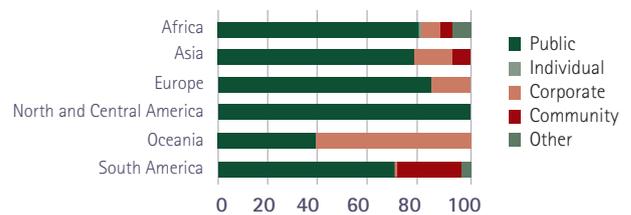
80% of the world's forests are publicly owned, but ownership and management of forests by communities, individuals and private companies is on the rise

Despite changes in forest ownership and tenure in some regions, most of the world's forests remain under public ownership. Differences among regions are considerable. North and Central America, Europe (other than the Russian Federation), South America and Oceania have a higher proportion of private ownership than other regions. In some regions, there is an increasing trend of involving communities, individuals and private companies in the management of publicly owned forests.

Forest ownership patterns, 2005 (%)

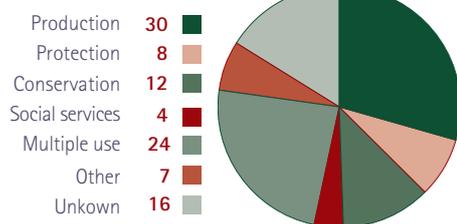


Management rights in public forests, 2005 (%)



Forests are managed for a multitude of uses and values

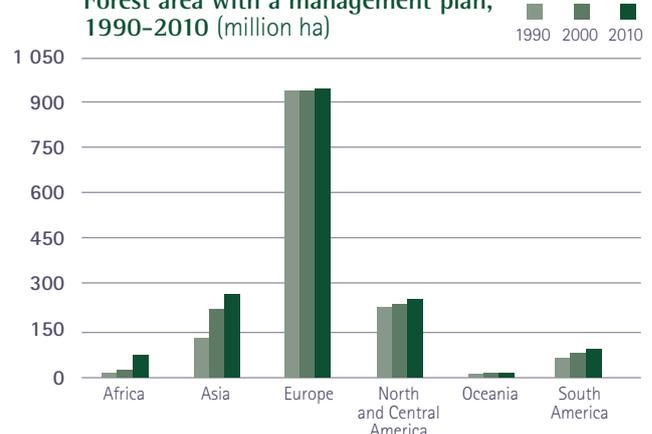
Designated functions of the world's forests, 2010 (%)



More than 1.6 billion hectares of forest have a management plan

The area of forest covered by a management plan – an important tool for achieving sustainable forest management – is steadily increasing, yet information is only available for 80 percent of the total forest area.

Forest area with a management plan, 1990–2010 (million ha)



Information is collected on the area of forest under sustainable forest management

The area of forest with a management plan is not necessarily an adequate indicator of the area of forest under sustainable forest management. For example, plans may not be effective, or forests may be conserved and sustainably used without a plan. Therefore, for FRA 2010, countries were asked to provide information on the area of forest under sustainable management using national definitions, criteria and assessment methods, including expert estimates. More than 100 countries, representing 62 percent of the global forest area, responded. Although data cannot be compared across countries or aggregated at the global scale, the responses indicate that significant progress has been made over the last ten years.



FRA 2010 – vital information to assess progress towards global goals and to inform public debate on forest-related issues

FRA 2010 provides new data on forest area change – one of the 60 indicators of the Millennium Development Goals. It also encompasses indicators used to monitor progress towards the 2010 Biodiversity Target of the Convention on Biological Diversity and the four Global Objectives on Forests adopted by the United Nations Forum on Forests. In addition, FRA 2010 statistics on trends in forest carbon stocks will support predictions of climate change and development of appropriate mitigation and adaptation measures.

All of this information, combined with data on variables such as forests' health, their contributions to national economies and the legal and institutional framework governing the management and use of the world's forests, will support policies, decisions and negotiations in all matters where forests and forestry play a part.



Capacity building and partnerships

FAO works actively with countries and forest-related organizations to identify and address information gaps for continuous improvement of knowledge about forests and forestry.

The FRA process helps enhance country reporting capacity through training and feedback on national reports. In response to specific country requests, FAO also provides technical support to implement and improve national forest monitoring and assessment systems, for new and better information.

Members of the Collaborative Partnership on Forests, regional groups, non-governmental organizations and countries partnered in the design and implementation of FRA 2010. Joint planning for the next global assessment (FRA 2015) will commence in 2011 – based on an in-depth evaluation of FRA 2010.





To read more

The FRA 2010 documentation will include:

- a full report with more detailed analysis;
- thematic studies with additional information on forest degradation, trees outside forests, forest genetic resources, and forests, livelihoods and poverty;
- individual reports from each of the 233 countries and areas included in FRA 2010;
- a set of some 40 global tables and an interactive database;
- the results of the global remote sensing survey of forests.

These materials will be made available at
www.fao.org/forestry/fra2010

Photos: Giulio Napolitano; Joseph O'Brien/Bugwood;
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