The global view

EXTENT OF FOREST RESOURCES

The world has just under 4 billion hectares of forest, covering about 30 percent of the world's land area. Forests are unevenly distributed around the world: of 229 countries or other reporting areas in FRA 2005, 43 have forest area exceeding 50 percent of their total land area, while 64 have forest area of less than 10 percent (Figure 65). Five countries (the Russian Federation, Brazil, Canada, the United States of America and China) together account for more than half the total forest area.

Deforestation continues at an alarming rate of about 13 million hectares a year. At the same time, forest planting and natural expansion of forests have significantly reduced the net loss of forest area.

Over the 15 years from 1990 to 2005, the world lost 3 percent of its total forest area, an average decrease of some 0.2 percent per year (Figure 66). From 2000 to 2005, the net rate of loss declined slightly – a positive development. In the same period, 57 countries reported an increase in forest area, and 83 reported a decrease (including 36 with a decrease greater than 1 percent per year). However, the net forest loss remains 7.3 million hectares per year or 20 000 ha per day.

Carbon stocks in forest biomass decreased by about 5.5 percent at the global level from 1990 to 2005. Regional trends generally follow the trends in forest area and growing stock: carbon stocks are increasing in Europe and North America and decreasing in tropical regions.

BIOLOGICAL DIVERSITY

This theme includes so many interrelated variables that it is difficult to identify trends. Perhaps the most positive one is that many countries are increasing the forest area designated for conservation. From 1990 to 2005, the area so designated increased by 32 percent, a total increase of 96 million hectares, with increases in all regions. Globally, more than 11 percent of total forest area has been designated primarily for conservation of biological diversity (Figure 67).

Globally, 36 percent of forests are categorized as primary forests (forests of native species in which there are no clearly visible indications of human activity and ecological processes are not significantly disturbed). The leader is Latin America and the Caribbean (75 percent), followed by North America (45 percent).

At the global level, an estimated 6 million hectares of primary forest are lost or modified each year. Nine of the ten countries that account for more than 80 percent of the world's primary forest area lost at least 1 percent of this

FIGURE 65 Forest area, 2005

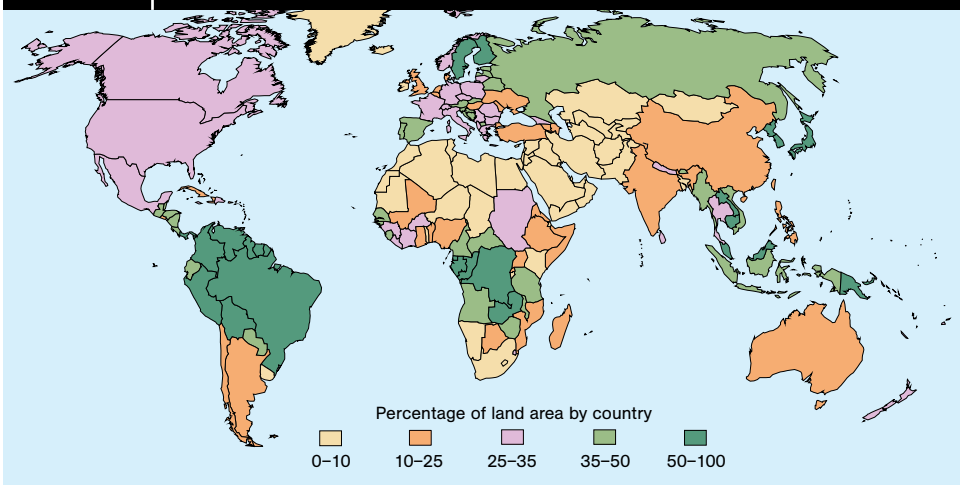


FIGURE 66 Annual net change in forest area, 2000–2005

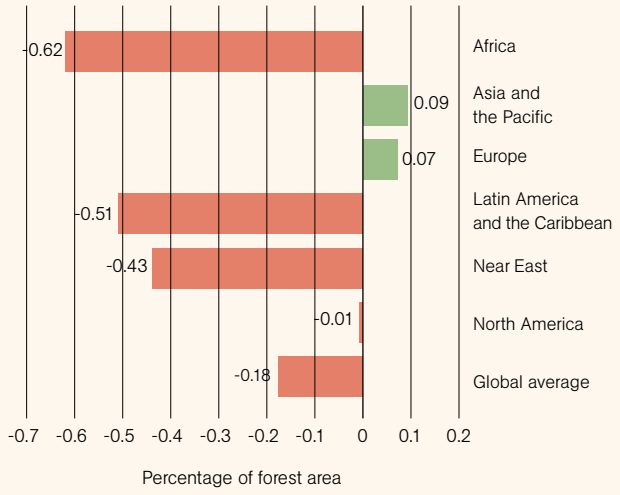


FIGURE 67 Percentage of forest area designated for conservation, 2005

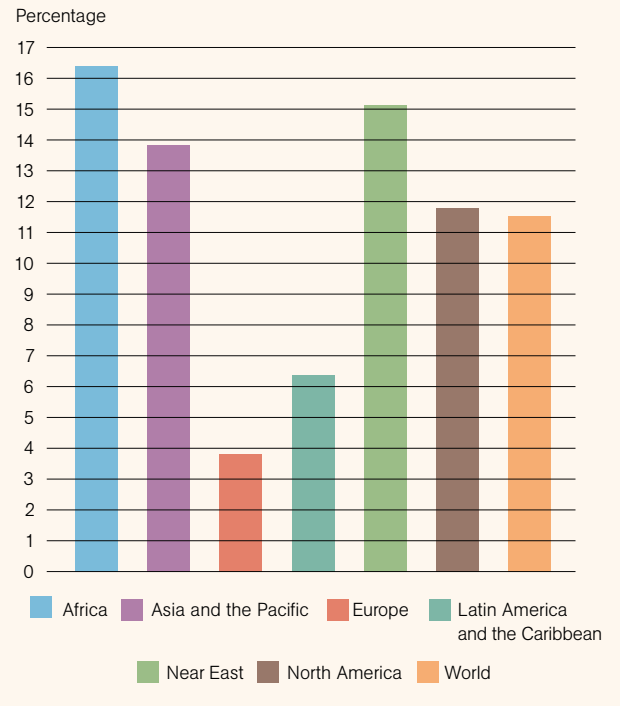
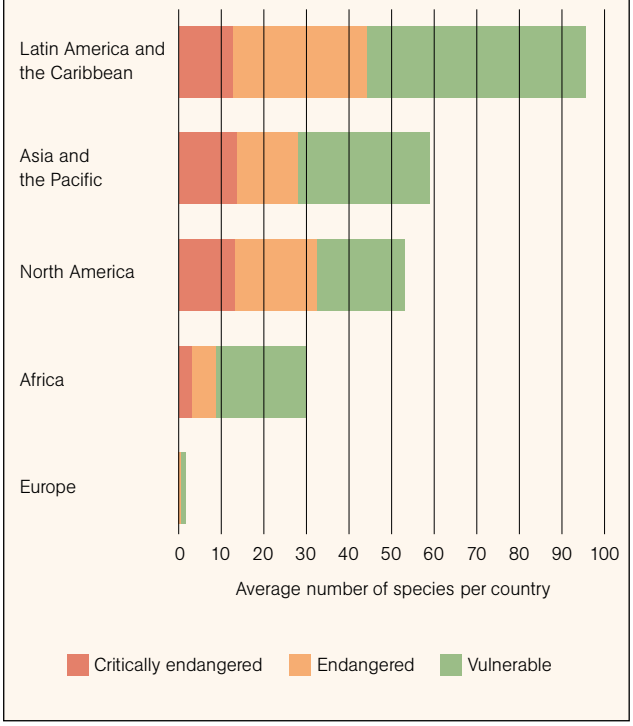


FIGURE 68 Vulnerable and endangered tree species



area from 2000 to 2005, led by Indonesia (13 percent loss in just five years), Mexico (6 percent), Papua New Guinea (5 percent) and Brazil (4 percent).

Another indicator of biological diversity is the number of threatened or endangered species (Figure 68). A majority of vulnerable and endangered tree species are found in tropical countries. Recently established baseline data will facilitate the identification of trends in the future.

In summary, there is good and bad news. The increase in forest designated for conservation is a positive trend, indicating political will in many countries to conserve biological diversity. However, the continuing decline in primary forests in most tropical countries is a matter of serious concern. While there are insufficient trend data to conclude that forest biological diversity is declining at a specific rate at the global level, there is nonetheless a clear

downward trend in key countries in which primary forests are under pressure from growing populations, expansion of agriculture, poverty and commercial logging.

FOREST HEALTH AND VITALITY

Most countries do not have reliable information on the area of forest affected by forest fires, insect pests, diseases and other disturbances such as weather-related damage because they do not systematically monitor these variables. For FRA 2005, only 20 countries reported on all four, and most of these were in Europe. At the global level, for countries that were able to report on different aspects, an average of 1.4 percent of their forest area was adversely affected by insects in an average year; 1.4 percent was affected by diseases; and 0.9 percent by forest fires. The data on other disturbances were not sufficient to draw conclusions at the global level.

There is a growing trend towards adopting more sustainable forest management strategies to contain forest pests, particularly in developed countries. These changes are related to changes in the perception and role of the forest, which is increasingly valued not just for economic reasons, but also for its ecological and social functions. In some regions, the risk of pests is being reduced – for example, through the replacement of large monocultures by smaller, mixed-species and mixed-aged stands in many European landscapes.

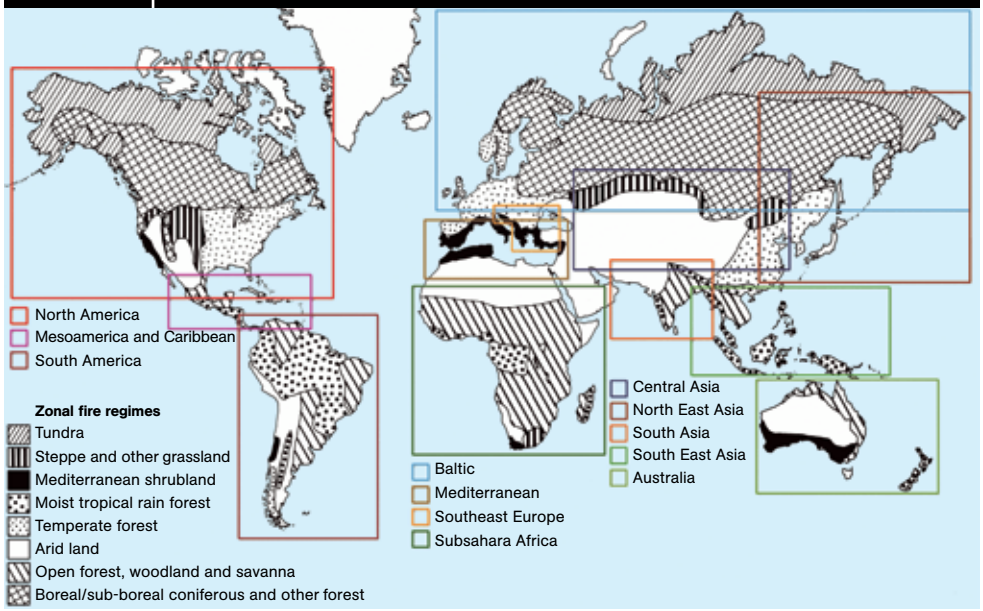
More information is available on pests of trees grown in developed than in developing countries – and also on pests in commercially valuable, planted forests rather than natural forests. Virtually nothing is known of the pests associated with trees harvested from natural forests in the tropics. Awareness of the need to gather and share information on forest pests is increasing, however; for example, 25 countries, including major forest countries such as Brazil, China and Indonesia, have provided information for a series of pest profiles (covering insects, diseases, nematodes, parasitic plants and mammals) currently being compiled by FAO.

Rapid transport, ease of travel and free trade have facilitated the spread of pests. In recent years, a number of invasive forest species have had an adverse impact on forestry and trade. For example, the movement of the Asian longhorn beetle, *Anoplophora glabripennis*, contributed to the adoption of an international standard for treating wood packaging material in international trade by the Interim Commission on Phytosanitary Measures of the IPPC.

A review of fire management based on papers prepared by national fire experts in different regions (FAO, 2006d) reached the following conclusions at the global level:

- An estimated 350 million hectares suffer wildland fires each year. This is equivalent to about 9 percent of total forest area, but the term "wildland" includes non-forest areas such as savannah, brush and open range. The actual damage to forests is less than 5 percent per year, but better data are needed.
- While many countries report that fire seasons are becoming more severe, there is insufficient information to conclude whether the total area burned or number of forest fires is increasing at the global level.
- At least 80 percent of fires are caused by people – and in some regions up to 99 percent. Agricultural needs and land clearing are the most common causes of fire,

FIGURE 69 UN-ISDR/GFMC Global Wildland Fire Network

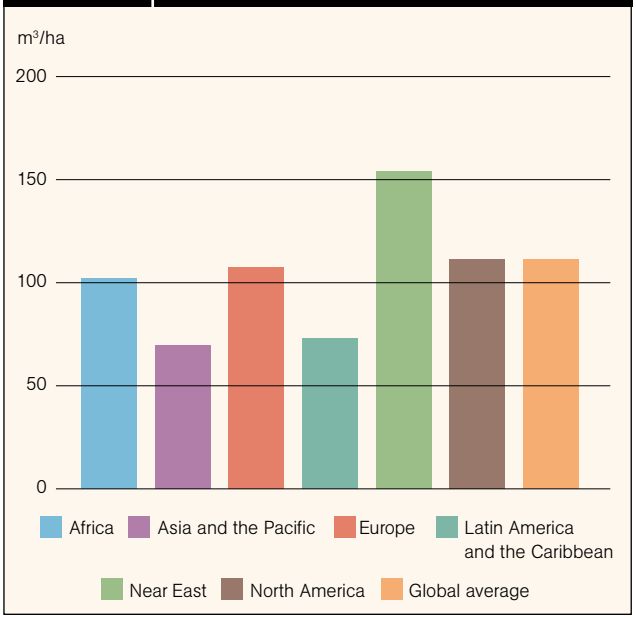


SOURCE: International Strategy for Disaster Reduction (ISDR) and Global Fire Monitoring Center (GFMC).

followed by arson. Lightning is the major non-human cause of wildfires.

- Fire can have positive or negative effects on forests, and its impact on forest health and vitality varies greatly in different ecosystems. Some countries experience almost no fires.
- Countries with serious wildfire problems have found that investing in fire prevention can be more cost-effective than concentrating on fire control, which is dangerous and expensive. Countries with fire management programmes invest in both approaches.
- Community-based fire management programmes are increasingly effective, in both developed and developing countries.
- International collaboration is increasing, as evidenced by the creation of 12 regional wildland fire networks (Figure 69) and approximately 100 transboundary bilateral fire agreements between neighbouring countries.

FIGURE 71 Growing stock per hectare, 2005



PRODUCTIVE FUNCTIONS OF FOREST RESOURCES

As would be expected, the countries with the largest forest area represent the bulk of the world's wood volume (based on total growing stock) (Figure 70). However, growing stock per hectare varied among regions, owing primarily to climatic and other ecological differences (Figure 71).

In 2005, the area of forest designated for wood production as one of the management objectives was 50 percent. About 34 percent of the world's forest area was designated primarily for production. From 1990 to 2005, the forest area so designated declined by 5 percent, compared with a decrease in total forest area of 3 percent over the same period. This trend is not surprising, as the increase in forest area designated primarily for conservation of biological diversity increased by roughly the same amount. Perhaps this reflects a subtle change in global perceptions of forest values.

Countries that report a low percentage of their forest designated for production tend to report a high area for "multiple purpose", which usually includes production. It would appear that countries have different ideas on the meaning of this classification. For example, two of the largest producers of wood products in the world, the United States of America and Canada, report only 12 percent and 1 percent, respectively, as designated primarily for production.

The area of productive forest plantations increased by 2.5 million hectares between 2000 and 2005, indicating that a larger portion of wood removals may come from forest plantations in the future.

FIGURE 70 Share in global wood volume in forests, 2005

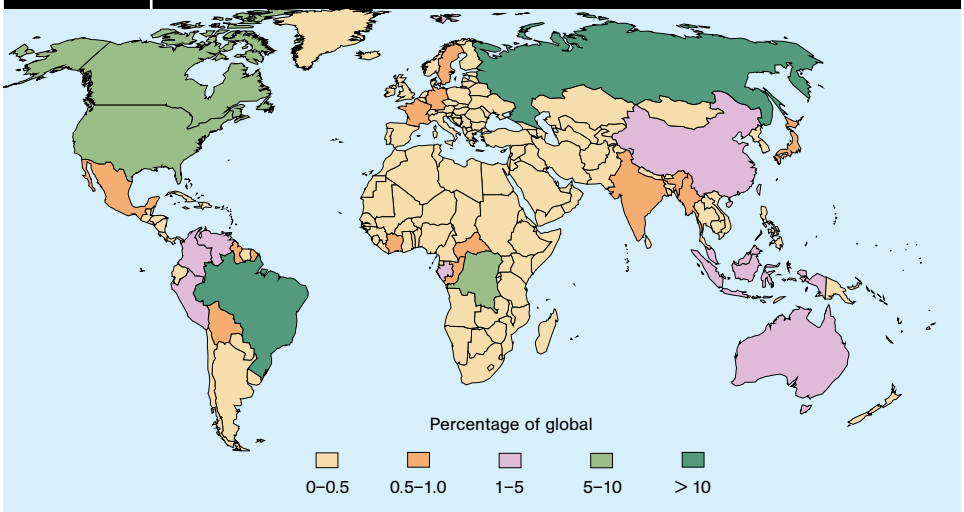


FIGURE 72 Designated primary functions of forests, 2005

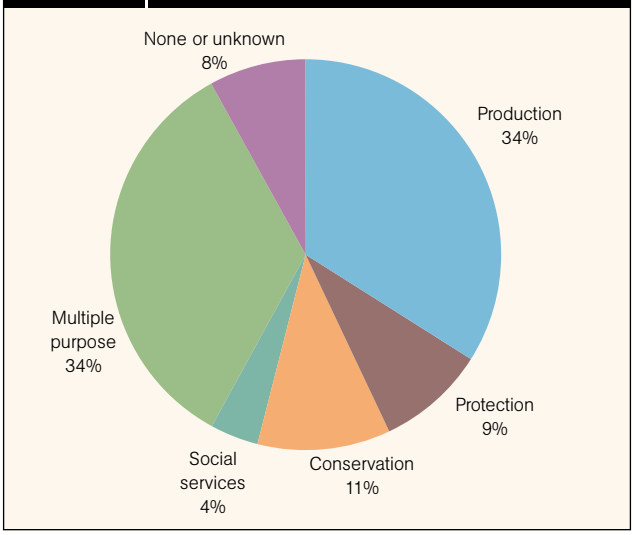
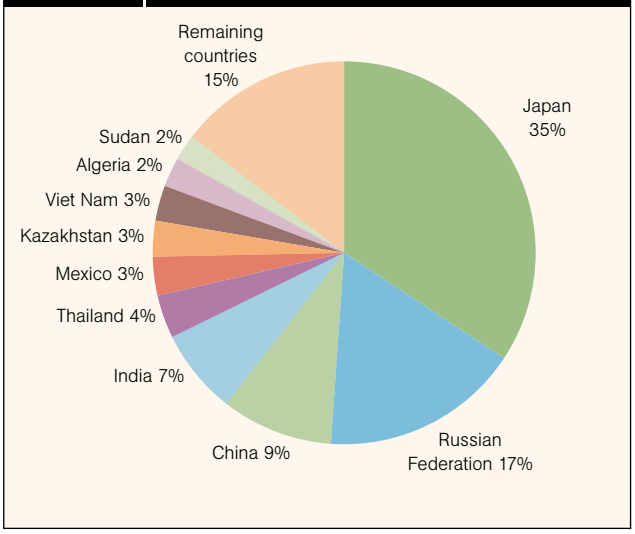


FIGURE 73 Ten countries with largest area of protective forest plantations, 2005



PROTECTIVE FUNCTIONS OF FOREST RESOURCES

Some 9 percent of global forests are designated primarily for protection. However, not all countries use this category to classify their forests, and all forests perform some protective functions. Thus, while this is an interesting statistic, it clearly under-represents the extent of forests that perform protective functions. Additional research will be required to find improved variables to estimate this important forest function. In fact, a significant percentage of the world's forests are designated for multiple purposes, which can include forest protection (Figure 72).

In many countries, protective functions are the main reason for planting new forests or trees (Figure 73).

SOCIO-ECONOMIC FUNCTIONS

The section on productive functions of forest resources presented information on global wood volume and growing stock (Figures 70 and 71). An illustration of the consumption of wood products completes the picture (Figure 74).

Primary forest products (roundwood, including industrial roundwood and fuelwood) represent a relatively large share of the forest sector's value in Africa, Asia and the Pacific and Latin America and the Caribbean. In contrast, wood-processing industries and pulp and paper account for the lion's share of the value of the sector in more developed regions.

Trade of forest products among countries is increasing (see Trade in forest products, p. 90). A positive net trade balance indicates that the value of exports exceeds the value of imports (Figure 75). Throughout the period from 1990 to 2004, Asia and the Pacific continued to be the major net importer of forest products. North America was, for many years, a net exporter, but in recent years it has become a net importer as well. The trend for Europe is the opposite of that for North America; today Europe is the leading net exporter of forest products.

FIGURE 74 Consumption of wood products, 2003

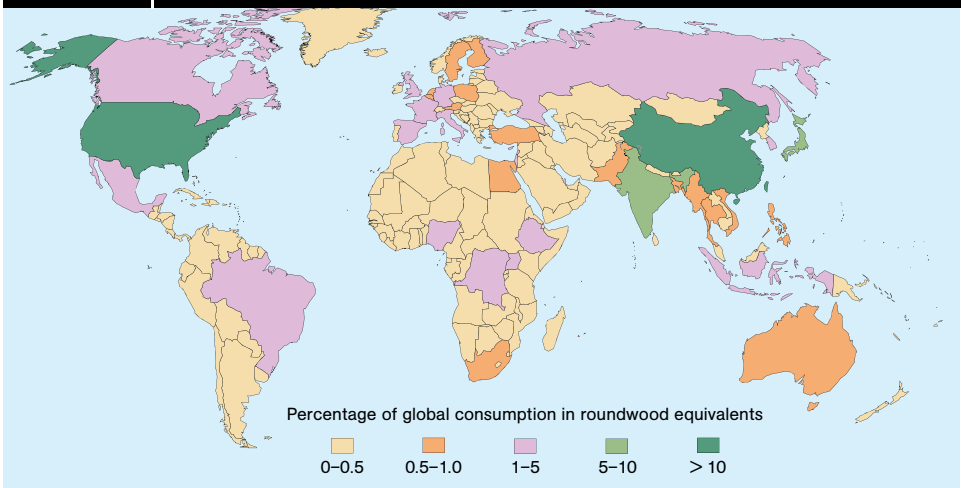
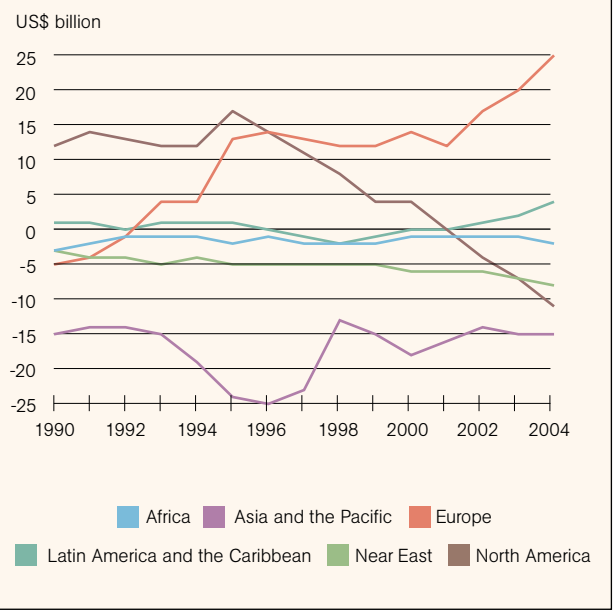
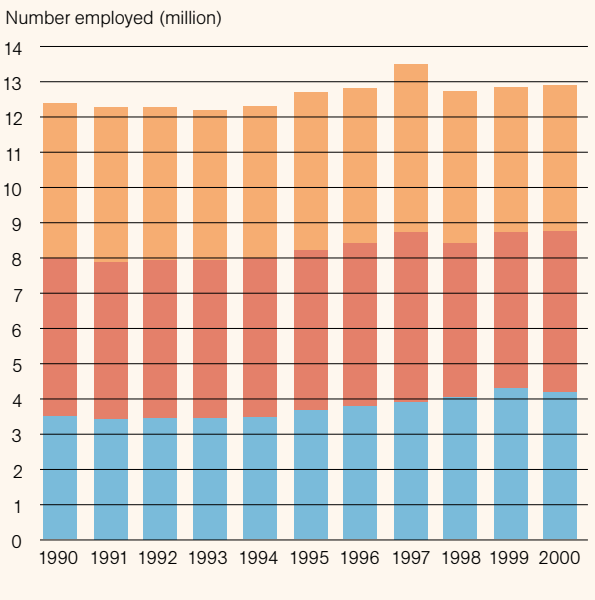


FIGURE 75 Trends in net trade of forest products by region



NOTE: A positive value indicates net export. A negative value indicates net import.

FIGURE 76 Global trends in formal forest sector employment



There was a gradually increasing trend in employment in the forest sector during the 1990s (Figure 76). At the global level, it is interesting to note that employment is roughly equal in the three major subsectors: roundwood production, wood-processing industries and pulp-and-paper industries. In general, roundwood production provides a larger share of jobs in developing countries, and the other two sectors provide most of the jobs in developed countries.

At the global level, employment increased by 4 percent from 1990 to 2000, while the forest sector's share of value added increased by only 1 percent (Table 37). These are significantly lower levels than in the global economy as a whole. Trade plays an increasingly important role in the forest sector, with exports continuing to increase much faster than other variables. Trade is especially significant in promoting economic growth in developing regions.

Almost 4 percent of the world's forests are managed primarily for social services such as recreation, education and tourism. Europe seems to give the most attention to social services provided by forests; almost 72 percent of Europe's forest area has social services as one of the designated functions.

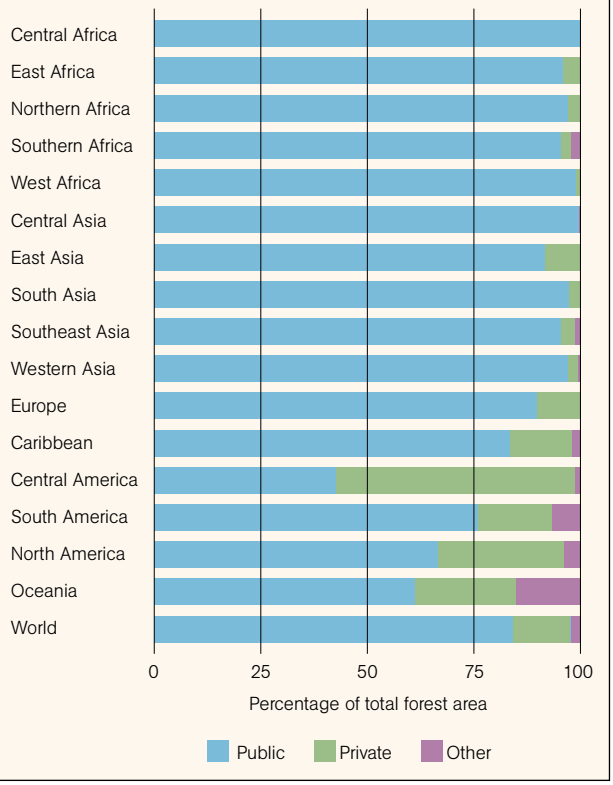
TABLE 37

Status and trends of forest-sector employment, value added and exports by region

Region	2000						Change in absolute values, 1990–2000		
	Employment		Value added		Exports		Employment	Value added	Exports
	(million)	*(%)*	*(US$ billion)*	*(%)*	*(US$ billion)*	*(%)*	*(%)*	*(%)*	*(%)*
Africa	0.5	4	8	2	3	2	6	5	60
Asia and the Pacific	5.6	43	88	25	20	14	10	–2	51
Europe	3.6	28	90	25	71	49	–12	–14	58
Latin America and the Caribbean	1.2	10	30	9	6	4	39	46	90
Near East	0.4	3	3	1	<1	<1	28	–14	169
North America	1.5	12	136	38	44	31	–1	10	33
All tropical countries	**3.0**	**24**	**48**	**14**	**16**	**11**	**23**	**34**	**47**
All temperate countries	**9.9**	**76**	**306**	**86**	**128**	**89**	**–1**	**–2**	**50**
World	**12.9**	**100**	**354**	**100**	**144**	**100**	**4**	**1**	**50**

NOTE: The changes in value added and exports are changes in the real value of these items (i.e. adjusted for inflation).
SOURCE: FAO, 2004a.

FIGURE 77 Ownership of forests by subregion



LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

Legal, policy and institutional framework is perhaps the most important factor in setting the stage for sustainable forest management. Positive change is evident in all regions.

There are signs of political commitment towards sustainable forest management in the vast majority of countries. In the 15 years since the United Nations Conference on Environment and Development (UNCED), most countries have enacted new, more progressive forest laws and policies. Over 100 countries have established national forest programmes in an attempt to manage forests more holistically.

It is virtually impossible to compare the progress being made under this thematic element by country or by region. The nature of laws, policies and institutions is such that each country is unique. The first of the "Forest Principles" agreed to by all countries at UNCED was that management of forests is the sovereign responsibility of each country.

Nonetheless, several long-term trends are apparent. In many countries, forest lands are passing from national control to local management (devolution), although most forests remain under public ownership (Figure 77). In others, for example in Eastern Europe, there is a trend from public to private ownership (privatization). Awareness of the importance of secure forest tenure arrangements is increasing. In a number of countries, institutional responsibility for forests has shifted from agriculture ministries to environment ministries, reflecting a shift in emphasis from development towards conservation.

Despite the generally positive trends, much remains to be done. FAO, ITTO, the World Bank and bilateral aid agencies have a continuous backlog of requests from countries for assistance in strengthening forest policies and institutions. For example, FAO is able to undertake an average of about ten new projects each year to strengthen national forest institutions (through its Technical Cooperation Programme), but the demand from countries is considerably higher than the ability to respond. The National Forest Programme Facility supports the efforts of more than 40 countries to increase the participation of all stakeholders in forest decision-making processes (Box 4), but the demand for additional assistance far exceeds its capabilities.

BOX 4 National Forest Programme Facility

The National Forest Programme Facility (see www.fao.org/forestry/site/30766/en) is a funding mechanism hosted by FAO that supports active stakeholder participation at the country level in the development and implementation of national forest programmes. It focuses on capacity-building and information-sharing, and offers information services on national forest programmes worldwide.

The Facility stimulates participation in the national forest programme process by providing grants directly to stakeholders in partner countries through a competitive and transparent process. Its overall objective is to assist countries in developing and implementing national forest programmes that effectively address local needs and national priorities and reflect internationally agreed principles. Informed and broad participation is the key to achieving this objective.

Since it was created in 2002, the Facility has developed partnerships with 42 countries and four subregional organizations; it has allocated US$6 million under 220 grants to stakeholders, about 70 percent of which are non-governmental (see figures). Facility grants have supported the participation of stakeholders in formulating policies and strategies, broadening national forest programmes and developing new legal, fiscal and institutional instruments. The Facility has also launched information-sharing initiatives.

Country support, 2002–2006

National Forest Programme Facility partners