Chapter 7

Socio-economic functions

OVERVIEW

Forests provide a wide range of economic and social benefits to humankind. These include contributions to the overall economy – for example through employment, processing and trade of forest products and energy – and investments in the forest sector. They also include the hosting and protection of sites and landscapes of high cultural, spiritual or recreational value. Maintaining and enhancing these functions is an integral part of sustainable forest management.

Information on the status of and trends in socio-economic benefits is thus essential in evaluating progress towards sustainable forest management, together with the more usual statistics on the predominantly environmental values considered under the other themes.

Economic benefits are usually measured in monetary terms and may include: income from employment in the sector; the value of the production of goods and services from forests; and the contribution of the sector to the national economy, energy supplies and international trade. In addition, the economic viability or sustainability of the sector can be assessed by measures such as the profitability of forest enterprises or the level of investment.

The social functions of forests are often more difficult to measure and can vary considerably among countries, depending on their level of development and traditions. For example, in developed, post-industrial societies, the benefits of forests for recreation and amenity values or the maintenance of a rural way of life may be most important, while in developing countries, the area of forests available for subsistence activities or the number of people employed in the sector may be a better indication of their social value. Given the difficulties of measuring the social benefits of forests, social functions are often measured in terms of inputs rather than outputs (e.g. the area or proportion of forests used to provide various social functions).

All the international processes on criteria and indicators include a section on the monitoring and assessment of socio-economic functions or benefits of the forestry sector. A wide variety of variables may be measured: production and consumption; recreation and tourism; funding and investment in the forest sector; cultural, social and spiritual needs and values; forestry employment; health and safety; and community needs.

In FRA 2005, countries provided information on four measures of socio-economic functions:

- Value of wood and non-wood forest product removals. FRA 2005 examines the production of primary products, excluding the benefits of downstream processing.
- Employment in forestry. Figures refer to employment in forestry activities rather than employment in the whole forestry sector (i.e. they exclude employment in processing of wood and non-wood forest products) and they only include formal employment. Countries were asked to provide information for 1990 and 2000 only. No forecasting to 2005 was done.
- Ownership of forest and other wooded land. Three classes of ownership were used: public, private and other. Countries were asked to provide information for 1990 and 2000 only. No forecasting to 2005 was done.
- Areas of forest designated for social services. Two measures were included: area of forest for which the provision of social services was designated as the primary

function and total area of forest for which recreation, education and other social services were designated as one of the functions.

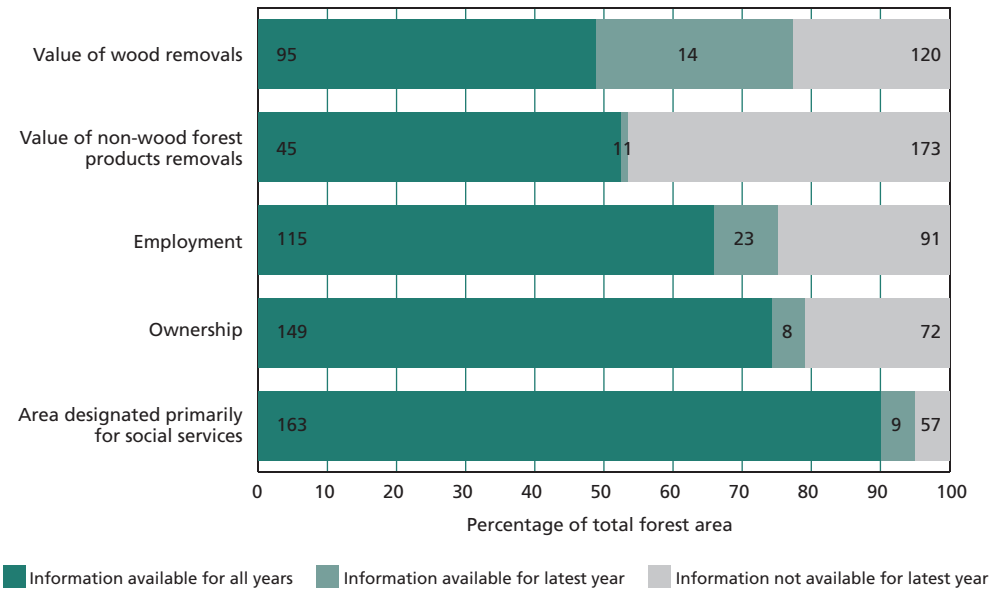
In general, the measures presented in FRA 2005 are more restrictive than those proposed in some international criteria and indicators processes because they refer to benefits from forests only (rather than benefits from the whole forestry sector, which include downstream processing). No information was requested from countries on socio-economic indicators related to health and safety, funding, investment, recycling and contribution to energy supplies, owing to a lack of information on these aspects in many countries.

In general, the availability of information was highest for the area of forest designated for different functions and ownership of forests and lowest for the value of NWFP removals (Figure 7.1). In addition, the quality of information reported on the value of outputs (removals of wood and non-wood forest products) was quite weak in several respects (e.g. incompatible definitions and measurement units, partial responses from some countries, and statistics that contradict other sources or seem otherwise implausible).

KEY FINDINGS

The reported value of roundwood removals in 2005 was about US$64 billion, with the major part of this (US$57 billion) coming from removals of industrial roundwood. The reported trend shows an increase of about 11 percent over the last 15 years, which is less than the rate of inflation over this period. Thus the reported value of removals in real terms has fallen at the global level. At the regional level, North and Central America accounted for about one-third of the total reported value, followed by Europe and Asia with about one-quarter each. Most regions show an increasing trend in the value of removals, with the exception of South America and, in particular, Asia. In part, these exceptions may be attributed to a shift in the structure of wood supply from harvesting of high-value wood in natural forests to an increase in the supply of lower-value wood from forest plantations.

FIGURE 7.1
Information availability – socio-economic functions



Note: Figures present number of countries in each category.

The reported value of NWFP removals amounted to about US$4.7 billion in 2005. Of this, plant products accounted for about three-quarters of the reported total, or just under US$3 billion, with a reported value of US$1.3 billion for food and US$0.5 billion for other plant products. The most significant animal product was bushmeat, with a reported value of US$0.6 billion. Asia and Europe accounted for almost all the total value reported by countries, and the trends at global and regional levels generally showed a slight increase from 1990 to 2000. However, the above figures must all be treated with great caution, as the availability and quality of this information appear to be quite weak and the reported statistics probably cover only a small fraction of the true total value of NWFP removals.

Countries reported that some 10 million people are employed in forestry. This is a decline of 10 percent compared with the employment figure for 1990. Most of the decline has occurred in the production of goods and can probably be attributed to increases in labour productivity. The figures for both periods may include some employment in informal activities. Although FRA 2005 does not include data on informal employment or employment in the wood processing industry, it was difficult for some countries to separate these. Thus, the actual figure for formal employment is probably somewhat less than 10 million. However, if the informal sector were to be intentionally included, the importance of the forestry sector – for rural livelihoods, for example – would be much higher than reported here.

With respect to ownership of forests and other wooded land, the area of private ownership is increasing, but the majority of the world's forests remain under public ownership (84 percent of forest and 90 percent of other wooded land). There are considerable differences among regions, however, with some having a significantly higher proportion of private ownership than others (e.g. North and Central America, Oceania and South America).

At the global level, almost 4 percent of forests are managed primarily for recreation, education, tourism and other social services. However, information availability is a problem in many regions. Europe seems to give the most attention to the social services provided by forest resources through active designation of areas for this purpose.

In general, the economic contribution of forests is declining (e.g. the reported declines in employment and in the real value of outputs from the sector), although the social contribution of forests may be increasing slightly in some regions (e.g. Europe). However, this does not necessarily indicate that the value of this contribution has fallen. Lower employment reflects increases in labour productivity, and the decline in the value of output is the result of lower product prices. Both of these changes suggest that the sector is becoming more efficient, which benefits the downstream processing sector and consumers. Thus the declining contribution can be viewed as an indicator of success.

VALUE OF WOOD REMOVALS

The combined value of removals of wood and non-wood forest products is an indicator of the contribution of forests and woodlands to national economies. This information is used to develop and monitor national policies, set priorities and allocate resources.

The present analysis examines the value of wood removals from forests only (i.e. it excludes other wooded land). It does, however, include the data from eight countries that provided information for forests and other wooded land combined (Algeria, Austria, Burkina Faso, Canada, Jamaica, Jordan, Namibia and Niger). Industrial roundwood and fuelwood were reported separately for FRA 2005 and are analysed separately here.

Information availability

At the global level, 109 countries, or some 42–47 percent of countries, depending on the year, reported on the value of industrial roundwood removals, with most reporting for the year 2000. Similarly, 37–41 percent of countries reported on the value of fuelwood

removals, also with most reporting for 2000. The countries reporting on either or both of these figures for 2005 account for almost 80 percent of the global forest area, although countries reporting for all three years account for only half of the area (Figure 7.2).

At the regional level, a higher proportion of countries in Asia, Europe and South America provided information. In Africa, only about one-third of the countries did so, but almost all of these provided information on the value of both fuelwood and industrial roundwood removals. In addition, most of the larger countries in Africa reported. Similarly, despite the relatively low number of responses from Oceania and North and Central America, most of the countries with significant forest areas in these two regions provided some information (e.g. Australia, Canada [1990 and 2000 only], Mexico, New Zealand, Papua New Guinea and the United States).

Another indicator of the availability of information is given in Table 7.1. This shows the proportion of total global and regional production covered by the countries

FIGURE 7.2
Information availability – value of wood removals

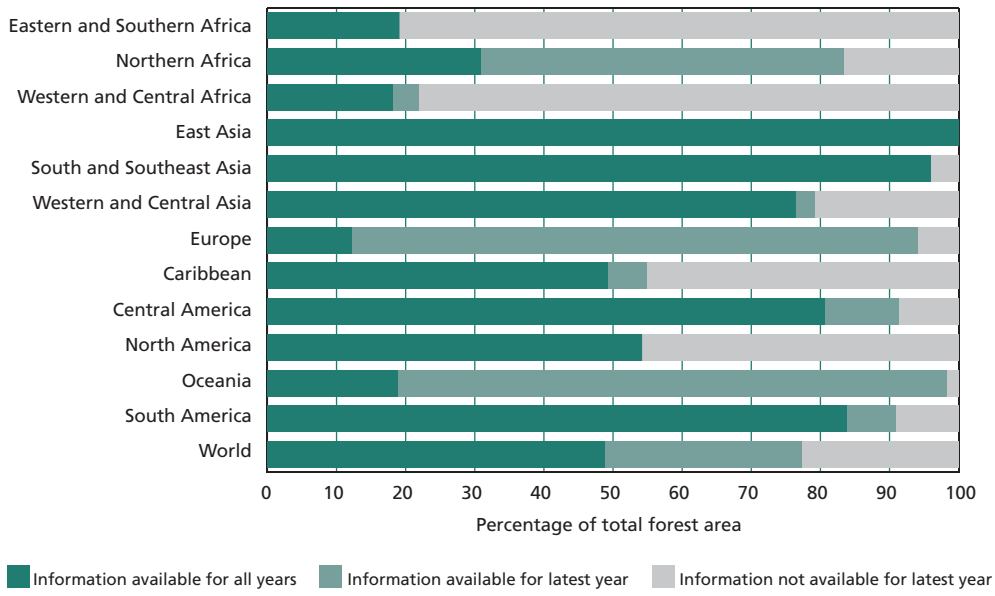


TABLE 7.1
Proportion of roundwood production in value of wood removals 2005

Region	Industrial roundwood production in 2004 *(million m³)*			Fuelwood production in 2004 *(million m³)*		
	Total for region	Total for countries reporting value in 2005	Proportion of total production in countries reporting values *(%)*	Total for region	Total for countries reporting value in 2005	Proportion of total production in countries reporting values *(%)*
Africa	71	45	64	551	298	54
Asia	220	219	100	777	487	63
Europe	508	392	77	117	86	74
North and Central America	624	426	68	130	110	85
Oceania	51	50	99	9	0	0
South America	149	146	98	194	172	89
World	**1 623**	**1 279**	**79**	**1 777**	**1 153**	**65**

Source: based on FAOSTAT (FAO, 2005a) and national reports.

providing value statistics for 2005 (FAO, 2005a). As this table shows, the countries providing information on the value of industrial roundwood removals accounted for almost 80 percent of global industrial roundwood production and 65 percent of fuelwood production.[1]

Status

Globally, the total reported value of wood removals in 2005 was US$64 billion, with some US$57 billion from industrial roundwood and a further US$7 billion from fuelwood (Table 7.2). Although the volume of global fuelwood production is about the same as the production of industrial roundwood, these figures suggest that the value of fuelwood production per cubic metre is roughly one-tenth that of industrial roundwood production, which seems plausible.

At the regional level, North and Central America accounted for about one-third the total reported value of removals (and it should be noted that Canada is not included in this figure). Asia and Europe come next, each accounting for about one-quarter of the total, followed by Africa, Oceania and South America.

The reported value of industrial roundwood removals across the regions follows a similar pattern. For fuelwood, however, Asia and Africa accounted for more than half the total reported value of removals – owing to the great number of people that use fuelwood in these regions (combined with the high population level in Asia). It is also worth noting that the reported value of fuelwood removals in Africa amounted to about 40 percent of the reported value of all removals, whereas in other regions, the reported value of fuelwood removals amounted to about 20 percent or less of the total.

The availability of information about the value of wood removals is quite good, as the countries providing this information account for a significant proportion of total global production. However, it should be noted that some significant countries reported the value of only a part of their total production (e.g. the figures for fuelwood removals in India and Indonesia were very low).

Trends

For comparability, Table 7.3 includes only information from countries that reported value information for all three years. As a result, values for 2005 may be lower than those shown in Table 7.2 (which includes all reporting countries). In addition, Table 7.3 does not include values for some significant countries that did not report any figures or reported for only one or two years (e.g. Canada, which reported for 1990 and 2000 only).

Globally, the reported trend in the value of wood removals shows a slight increase, from US$53 billion in 1990 to US$55 billion in 2000 and US$59 billion in 2005. Most of this is due to a reported increase in the value of industrial roundwood removals, as the reported value of fuelwood removals has not changed significantly.

The above figures amount to an 11 percent increase over the last 15 years. However, these figures have not been adjusted for inflation. After adjusting, the reported value of wood removals has certainly fallen at the global level during this period.

At the regional level, the reported trend in the value of wood removals shows an increase in all regions except Asia and South America. In particular, the reported trend in Asia shows a significant decline, reflecting the declines reported in some major countries (e.g. Indonesia, Japan and Malaysia). In part, this can be attributed to lower levels of removals in these countries over the period.

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[1] However, some countries reported the value of removals for only a portion of their total production. This was particularly a problem for fuelwood removals (e.g. in India and Indonesia). Thus the proportion of global production actually covered by the value statistics is somewhat less than implied.

TABLE 7.2
Value of wood removals 2005

Region	Value (million US$)		
	Industrial roundwood removals	Fuelwood removals	Industrial roundwood plus fuelwood removals
Africa	2 748	1 845	4 594
Asia	14 366	2 120	16 486
Europe	13 858	1 159	15 016
North and Central America	19 659	579	20 238
Oceania	1 839	n.s.	1 839
South America	4 281	1 347	5 628
World	**56 750**	**7 050**	**63 800**

TABLE 7.3
Trends in value of wood removals 1990–2005

Region	Value (million US$)		
	1990	2000	2005
Industrial roundwood removals			
Africa	999	1 826	2 361
Asia	20 375	15 806	14 365
Europe	9 977	8 800	11 832
North and Central America	10 313	19 090	19 536
Oceania	276	577	660
South America	4 697	3 355	4 232
World	**46 638**	**49 455**	**52 986**
Fuelwood removals			
Africa	968	1 206	1 369
Asia	2 010	1 843	2 118
Europe	638	633	970
North and Central America	554	560	579
Oceania	n.s.	n.s.	n.s.
South America	2 022	934	1 347
World	**6 193**	**5 176**	**6 383**
Industrial roundwood plus fuelwood removals			
Africa	1 967	3 032	3 729
Asia	23 268	18 411	16 483
Europe	10 616	9 433	12 802
North and Central America	10 867	19 650	20 116
Oceania	276	577	660
South America	6 719	4 289	5 579
World	**53 714**	**55 391**	**59 369**

In South America, the reported value of wood removals declined significantly from 1990 to 2000, but has since partly recovered – largely due to changes in Brazil, where the reported value of wood removals has followed a similar pattern. The level of industrial roundwood removals in that country has increased throughout the period, but the value has fallen and then risen again. This has been caused by a shift in the structure of production in Brazil over the last 15 years – from the production of industrial roundwood from natural forests (bringing a high price) to that from forest plantations (bringing a much lower price, but eventually greater production). A structural change such as this could also partly account for the trend in Asia.

The reported value of wood removals in Europe has increased slightly, showing a slight drop from 1990 to 2000 and then an increase. These changes probably reflect market liberalization in the formerly centrally planned economies of eastern Europe. A significant fall in production levels occurred in the early 1990s in Europe, followed by rapid growth in the latter part of the decade. The figures shown above do not capture all the profound changes that have occurred in Europe over the last 15 years (UNECE, 2005), but they do indicate that the value of removals is now higher than at the start of these changes.

In the other three regions (Africa, North and Central America and Oceania), the reported value of wood removals has roughly doubled. In Africa and Oceania this is due, to some extent, to increases in the level of removals. In addition, in all three regions, it seems likely that this has been supported by an increase in unit prices over the period. In contrast to the other regions, it is also likely that the reported value of removals has increased in real terms (i.e. after adjusting for inflation).

In terms of the substance of these figures, the most interesting feature is the trend in the reported value of wood removals shown in Brazil, as production shifted from natural forests to forest plantations. Given the current and projected trends in wood supply, it can be expected that more countries will display such a trend in the future.

This trend also highlights a final problem with these figures: they are an indication of the gross rather than the net value of output (or value-added). A decline in the value of removals (as shown in Brazil) may not necessarily indicate that the economic sustainability of forestry has declined. Rather, it could indicate that the sector has become more cost-efficient. In such cases, it is quite possible that gross value is declining while value-added (and hence economic viability) is increasing. In the future, it would be useful to include statistics for value-added for the whole sector, including processing, rather than only for the value of removals. These statistics would give a better indication of economic sustainability. They are found in national income accounts and can often be obtained relatively easily (Lebedys, 2004).

VALUE OF NWFP REMOVALS

The value of NWFP removals, like that of wood removals, is an indicator of the contribution of forests and woodlands to national economies. It also indicates the contribution of the sector to poverty alleviation, as these products are mostly collected by relatively poor people living in rural areas.

Information availability

Fifty-six countries provided information, accounting for slightly more than half the global forest area (Figures 7.3 and 7.4). In general, more information about value was available for plant products than for animal products. Plant product categories for which availability of information was highest were food, medicinal and aromatic plants, exudates and other plant products. For animal products, information was more available for the value of removals of bushmeat, honey and beeswax. For many products and reporting years, less than 10 percent of the countries provided information.

For almost all products and regions, more information was available for 2000 than for 2005. For example, 18 percent of countries provided information on food in 2000. At the regional level, the proportion of countries providing this information was highest in Asia and Europe. Very little information was available outside these regions.

Although availability of information about the value of NWFP removals appears to be very low, it should be noted that values are likely to be zero (or close to zero) for many of the products in countries not providing this information. On the other hand, figures supplied by countries are also likely to be very low estimates of the total value of their removals. Two main problems of underreporting were identified in country statistics. First, in many cases, countries reported the value of only part of total removals

FIGURE 7.3
Information availability – value of NWFP removals

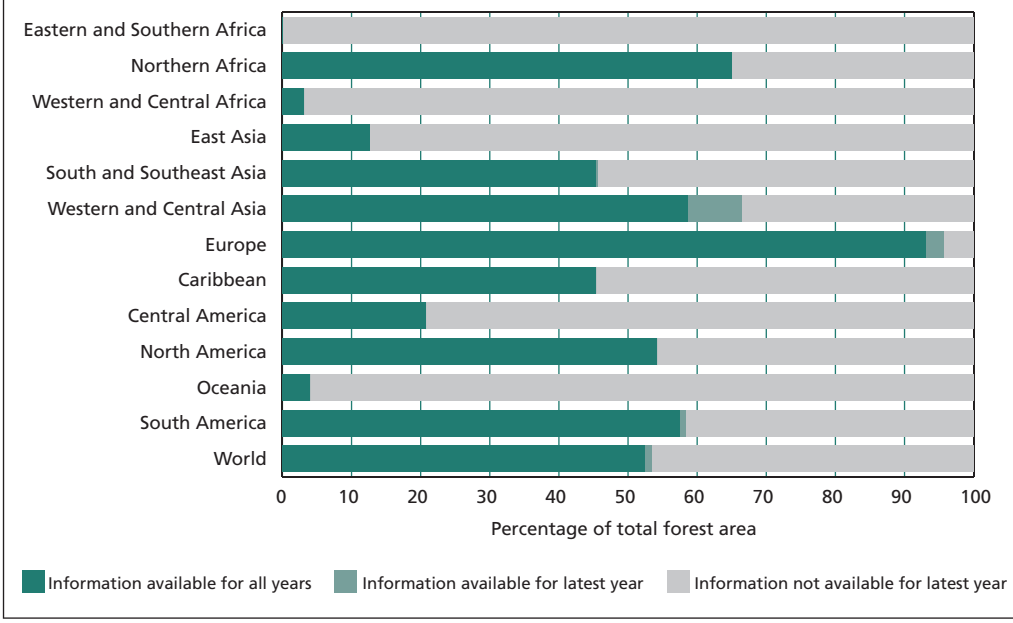
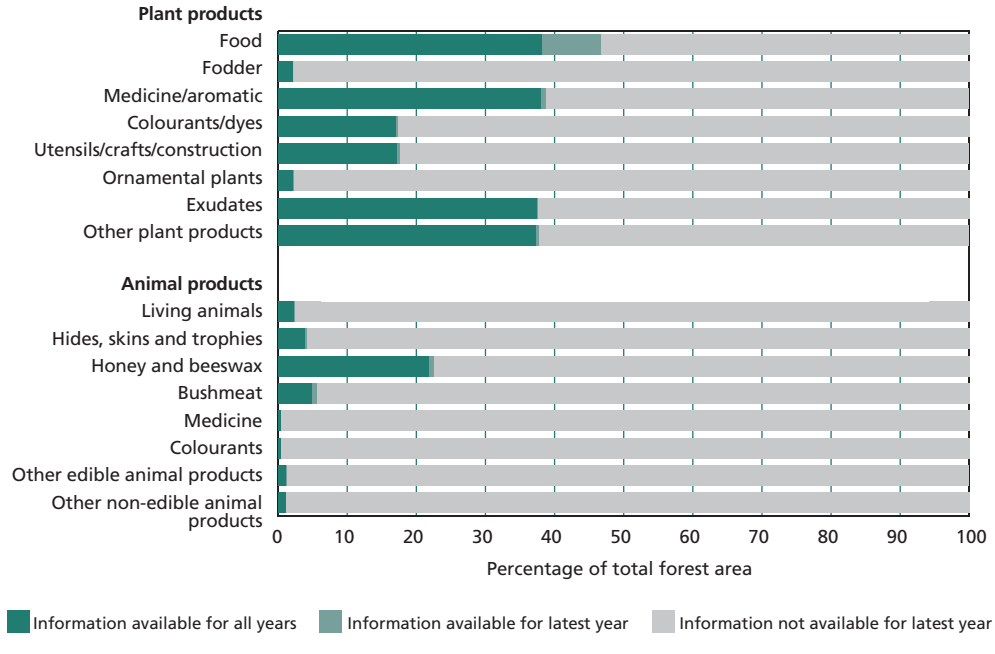


FIGURE 7.4
Information availability – value of NWFP removals by product category



(e.g. only removals for sale, or from state land, or of one of a number of products within a category). Second, the values reported were sometimes the value of exports only or of the income from licence fees to remove products.

Status

In 2005, the total reported value of removals amounted to about US$4.7 billion (Table 7.4). Plant products accounted for about three-quarters (or just under US$3 billion). Among these, food had the highest value (US$1.3 billion), followed by other plant

TABLE 7.4
Value of NWFP removals 2005 *(US$1 000)*

Region	Category of NWFP						Total
	Food	Exudates	Ornamental plants	Other plant products	Bushmeat	Other	
Africa	4 469	42 180	70	16 001	3 064	831 415	897 199
Asia	817 843	316 359	8	279 052	21	317 827	1 731 110
Europe	381 936	801	344 065	139 154	616 721	321 942	1 804 619
North and Central America	34 200	15 267	-	17 988	-	4 240	71 695
Oceania	-	0	0	11 463	181	6 946	18 590
South America	96 386	1 673	-	32 003	4 099	63 069	197 230
World	**1 334 833**	**376 280**	**344 143**	**495 661**	**624 086**	**1 545 439**	**4 720 443**

products (US$0.5 billion). Fruit, berries and nuts were identified as the main food products in most countries. Three specific products and countries accounted for the relatively high value of other plant product removals: bidi leaves in India, cork in Spain and manure in the Republic of Korea. Of the animal products, the reported value of bushmeat removals was by far the most important, with a value of US$0.6 billion.

At the regional level, Asia and Europe accounted for almost 90 percent of the total reported value of removals, with values of US$1.7 billion and US$1.8 billion respectively. In Asia, food was by far the most significant product, with a reported value of US$0.8 billion, followed by exudates and other plant products (US$0.3 billion each). In Europe, the reported value of bushmeat removals was US$0.6 billion, followed by food (US$0.4 billion) and ornamental plants (US$0.3 billion).

The other regions reported minimal values for NWFP removals in 2005, owing to very limited availability of information. For example, the reported value of bushmeat removals outside Europe was only US$5 million, which is likely to be a vast underestimate of the true value of removals in these other regions.[2]

The reported global value of NWFP removals in 2005 (US$4.7 billion) compares with a total value of global international trade in NWFPs of US$11.0 billion in 2004 (derived from United Nations, 2005c, following a methodology outlined in FAO, 2005e). Although the latter figure includes some trade in processed NWFPs, international trade probably accounts for only a tiny proportion of NWFP removals. Thus a comparison of these two figures suggests that the values reported here are a vast underestimate of the total value of NWFP removals.

Trends

Because of the lack of reported trends at the country level (i.e. very few countries provided statistics for all three years), Table 7.5 displays the total value reported for each year. Globally, it appears that the total value of removals increased from 1990 to 2000, then declined from 2000 to 2005. However, this is a function of the smaller number of countries reporting information for 2005 (in particular, China is missing). Thus the following analysis focuses on changes from 1990 to 2000, in which the information is slightly more comparable.

At the global level, the reported value of NWFP removals increased by 26 percent, from US$4.8 billion in 1990 to US$6.1 billion in 2000. The reported value of food removals increased significantly, from US$1.6 billion in 1990 to US$2.6 billion in 2000. The reported value of removals of exudates also almost doubled over the same period to US$0.9 billion in 2000. In contrast, the reported values of removals of the other two

[2] Much of the bushmeat produced in other regions is unregulated and/or illegal, so there are no official statistics and the product is not reported by countries.

most significant NWFPs (bushmeat and other plant products) declined slightly from 1990 to 2000.

At the regional level, the reported value of NWFP removals increased significantly in Asia (from US$2.0 billion in 1990 to US$3.4 billion in 2000) and increased very slightly in Europe (from US$1.5 billion in 1990 to US$1.6 billion in 2000). However, these trends may not be very reliable, given the small proportion of total NWFP removals covered by the information. For the same reason, reliable trends for the other regions cannot be derived from the small number of reported values.

The availability of information is very low for both the amount and the value of NWFP removals. However, given that these removals can have an impact on large numbers of poor people, there is great interest in this type of information (for example, the current interest in the contribution of forests to poverty alleviation and the emphasis on poverty reduction strategies and achievement of the Millennium Development Goals in many developing countries). In view of this, it is recommended that countries continue developing ways to collect, estimate and analyse this information with appropriate support from international partners.

EMPLOYMENT

The level of employment in forestry is an indicator of both the social and economic value of the sector to society. Employment provides income and, as forestry activities occur in rural areas that are often poorer than the average, it gives some indication of the sector's contribution to poverty alleviation. In social terms, the value of employment is in allowing individuals to become productive members of society.

It is important to gather and analyse this information, as it is a significant indicator of the impact of forests on people and demonstrates the contribution of the sector to broader economic aims and objectives. Many, if not all, governments are concerned about the level of employment and this is often a major performance indicator for government policy.

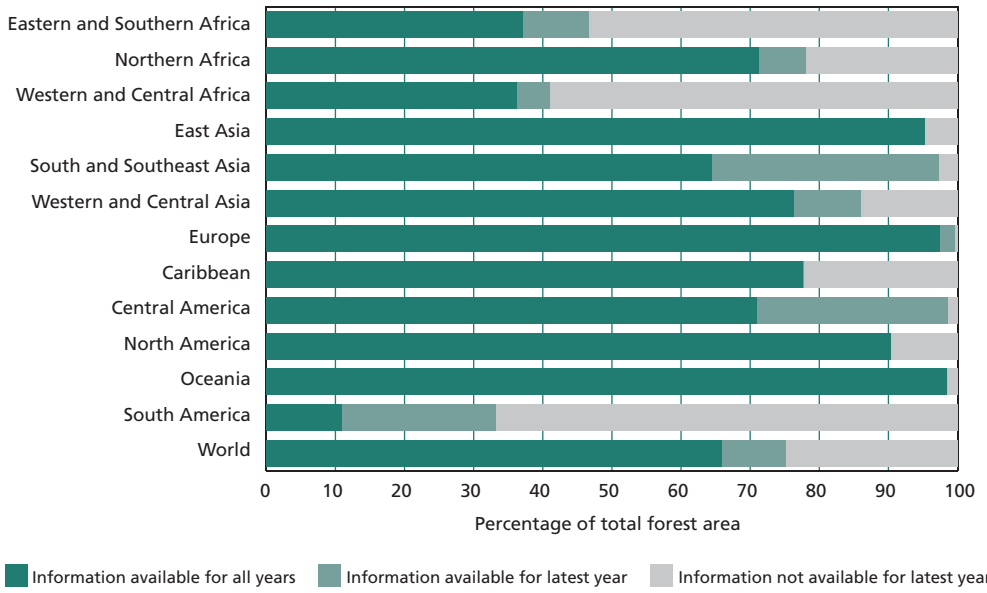
For FRA 2005, employment was defined as: "Any type of work performed or services rendered under a contract of hire, written or oral, in exchange for wage or salary, in cash or in kind", based on definitions by the International Labour Organization and the Employment Security Commission. However, information was requested only on employment related to the primary production of forest goods and related services, i.e. excluding the processing of wood and non-wood forest products. Thus the figures cannot be compared with statistics on employment in the forestry sector as a whole. The International Standard Industrial Classification, generally used by national statistical agencies, is being revised for greater clarity and level of detail for many economic activities (including forestry). It may be useful to review and refine the definition of forestry employment once this has taken place, with a view to increasing comparability between data sources and making full use of existing national employment statistics.

TABLE 7.5
Reported values of total NWFP removals 1990–2005 *(US$1 000)*

Region	1990	2000	2005
Africa	847 233	724 451	897 199
Asia	1 951 852	3 395 433	1 731 110
Europe	1 535 811	1 600 796	1 804 619
North and Central America	48 372	108 074	71 695
Oceania	18 889	42 648	18 590
South America	423 652	234 107	197 230
World	**4 825 808**	**6 105 508**	**4 720 443**

Note: The figures in this table should not be interpreted as illustrating actual trends, since some countries did not report on all product categories for all three reporting years.

FIGURE 7.5
Information availability – employment



Information availability

At the global level, 138 countries reported on employment. Those reporting for all three years account for about 67 percent of global forest area (Figure 7.5).

As a check on the quality of the information, the reported statistics were compared with the statistics on forestry employment reported by national statistical offices (Lebedys, 2004). This detailed examination of the quality of the statistics revealed a number of problems and issues, especially with a few of the significant countries (which affect the global results).

For example, the United States included employment in sawmilling in their employment figures for FRA 2005 (resulting in a much higher number than for employment in roundwood production alone). A similar problem may also have arisen for countries that reported employment in the public forest administration where these administrations also own and manage forest processing facilities. Conversely, the Russian Federation included only employment in the Ministry of Natural Resources (which is likely to be an underestimate of total employment in forestry).[3]

Perhaps the greatest concern identified was that some countries may have reported the number of people employed part time in the sector, without converting these figures to full-time equivalents. The most notable example of this was India, where the national report showed very high levels of employment in the sector (5.6 million and 4.9 million in 1990 and 2000 respectively). This was largely owing to the inclusion of some very high numbers for people employed in the establishment of forest plantations. These employment estimates were based on the number of hectares

[3] More generally, it should be noted that countries took different approaches to the inclusion/exclusion of employment in the public sector in their reported statistics. Some included all public-sector workers, while others apparently didn't include any. The FRA definitions asked countries to include "employment in direct supervision activities by private and/or public entities". However, this could have led to some errors, as it contradicts other standard economic classification systems (e.g. the International Standard Industrial Classification), which classify the government as a separate sector in the economy. It should also be noted that "provision of services" was defined more broadly than in other standard classification systems (e.g. to include ecotourism in forest areas).

planted multiplied by the average number of people employed per hectare. For forest plantation establishment, this factor was reported to be 3.8 persons per hectare. While 3.8 persons per hectare, on average, may have been employed at some time in planting trees, it seems very unlikely that this is a figure for permanent employment in tree planting.

Another possible problem is that some of the reported statistics may include the numbers of people collecting fuelwood and NWFPs for subsistence purposes. The guidelines and definitions (FAO, 2004b) specifically stated that only paid employment should be included in the statistics, but it seems likely that several countries also included employment in subsistence production.

Given the doubts about some of these figures, it is not possible to draw any robust conclusions about the current status and trends in forestry employment on the basis of the global totals for the statistics reported. A focused effort should be made to improve the quality of employment statistics in a few key countries in which the reported statistics are missing, or are very high but may be based on minimal survey data or very simple estimation techniques.

Status

The total reported level of employment in forestry in 2000 is 11.0 million people (Table 7.6), of which over half (6.0 million) are employed in the primary production of goods.

At the regional level, the reported level of employment is highest in Asia (8.3 million), with India accounting for over half of this and China a further one-quarter (2.0 million). Next highest are Africa and Europe, with reported employment of 0.9 million each, followed by North and Central America, with 0.6 million. Reported employment in the provision of services is generally much lower than employment in the primary production of goods, except in Africa and Asia. In Africa, this results from the inclusion of ecotourism employment in South Africa (estimated at 200 000). In Asia, it reflects the inclusion of 2.3 million people reportedly employed in forest plantation establishment and management (see previous comments).

Lebedys (2004) presents a figure of 4.2 million for total forestry employment in 2000. Although that figure includes estimates for a number of countries, it is notable that the statistics reported above amount to more than twice this figure. One country – India – accounts for a significant proportion of this discrepancy (the figure quoted in Lebedys is based on the results of an earlier FAO survey of forestry employment in which India reported a 1994 level of employment of only 263 000). In many other cases, the figures reported here and in that report are quite similar or can be explained by differences in definitions.

TABLE 7.6
Number of people employed in forestry in 2000

Region	Number employed *(1 000 person-years)*			
	Primary production of goods	Provision of services	Unspecified	Total
Africa	465	305	100	870
Asia	4 425	3 008	875	8 308
Europe	412	63	471	946
North and Central America	415	55	135	605
Oceania	28	4	6	37
South America	215	20	9	245
World	**5 960**	**3 455**	**1 596**	**11 011**

Trends

Trends are shown only for countries that reported for both years (Table 7.7). Globally, reported employment in forestry declined slightly from 1990 to 2000, by about 1 million (or 10 percent). At the regional level, Asia and Europe also showed this downward trend, while in the other regions, employment increased somewhat.

The changes in employment can be explained by a number of factors. Most of the decline has occurred in the primary production of goods, which can probably be attributed to increases in labour productivity (e.g. increased mechanization of harvesting operations). In Europe, the decline in employment numbers can also be explained by the restructuring of formerly centrally planned economies. In some countries, this has led to decreased production and employment. More generally, the privatization of forestry activities in eastern Europe has led to large increases in labour productivity in the region and, as a consequence, a decline in employment numbers. The regions showing an increase in employment may reflect roundwood production that is increasing faster than increases in labour productivity (for a more detailed discussion, see Lebedys, 2004).

OWNERSHIP OF FORESTS AND OTHER WOODED LANDS

Understanding the impact of tenure issues on sustainable forest management and recent trends is essential to the formulation of effective policies by governments. Forest ownership is in transition in many countries: ownership and control over natural resources is increasingly shifting from the state to local communities and to individual households (Scherr, White and Kaimowitz, 2003). Current trends in privatization and community involvement in forest management have been accompanied by rapid changes in resource tenure patterns and increasing complexity of stakeholder relations. These changes, in addition to affecting the way in which forests are managed, have social, political and economic implications.

Worldwide – and more specifically in developing countries – most forest areas are under the formal jurisdiction of governments, and forest management is still primarily a state matter. Excessive deforestation and forest degradation have resulted from population pressure, agricultural expansion, escalating demand for wood products, illegal logging, industrial development and rapid economic growth. This has triggered a debate not only on the effectiveness of public-sector forest management, but also on the relevance of overall state ownership.

Over the past 20 years, commitment has been growing to empower local communities, decentralize decision-making to local government units and increase private-sector involvement in forest management. This development is paralleled by

TABLE 7.7
Trends in number of people employed in forestry 1990–2000

Region	Number employed *(1 000 person-years)*							
	1990				2000			
	Primary production of goods	Provision of services	Unspecified	Total	Primary production of goods	Provision of services	Unspecified	Total
Africa	222	23	55	301	292	35	90	417
Asia	5 160	2 953	1 026	9 139	4 261	3 004	875	8 140
Europe	413	70	509	992	335	62	365	762
North and Central America	368	57	42	467	407	55	53	515
Oceania	26	4	4	35	28	4	6	38
South America	44	20	0	64	50	17	0	67
World	**6 233**	**3 128**	**1 637**	**10 998**	**5 372**	**3 178**	**1 389**	**9 939**

significant shifts in forest tenure and innovative institutional arrangements aimed at increasing the direct involvement of stakeholders in forest management.

To capture these trends, for the first time the assessment requested information classifying the world's forests as public, private or other (including non-classified). Analysis of the information reported reveals that more work is needed in defining the ownership- and tenure-related data to be collected and in ensuring that such data will be gathered at the global level. A thematic study on forest ownership and resource tenure will complement the information provided in FRA 2005 (Box 7.1).

BOX 7.1

FRA 2005 thematic study on forest ownership and resource tenure

With a view to assessing and understanding changes in forest ownership patterns, possible variations among continents and issues related to these trends, the FAO Forestry Department has begun a thematic study aimed at complementing the information collected through the FRA 2005 reporting table on forest ownership.

The study, to be released during 2006, was designed to collect, analyse and monitor data on forest ownership, resource tenure and related trends at the regional level in policy and law development.

This phase is a pilot exercise conducted in East and Southeast Asia. Similar studies are expected to be conducted in other regions. Its objective is to develop and test a methodology for collecting and monitoring forest ownership and tenure data at the global level that can be integrated into the FRA 2010 process. The exercise has been implemented on two levels:

Regional. A pilot survey was conducted in 17 countries,[1] aimed at collecting detailed data on forest areas for two variables: different types of ownership and different levels of control of and access to resources. The information was gathered through the use of a matrix designed for this purpose and was completed by country focal points (primarily government agencies).

National. Eleven country-specific case studies were conducted in nine countries[2] with the objective of expanding and strengthening the quantitative analysis done at the regional level and of complementing this with detailed qualitative information on types of forest tenure, particularly on resource ownership, management agreements and institutional arrangements. The case studies seek a better understanding of the relationship between forest resource tenure and forest management – and specifically of the implications for poverty alleviation.

Results and main conclusions

- Forests remain public to a great extent (86 percent), with limited differences among countries, and mostly under the direct control of central governments (79 percent).
- Devolution of management responsibilities to local communities involves no more than 10 percent of forests (18 percent if small-scale forest holders are included). In general, rights are devolved for degraded forests.
- Short-term management agreements prevail over long-term ones.
- Despite the examples provided by some countries – known for their well-established traditions of community forestry, joint forest management and private forestry – the scale of these schemes remains limited. Forests and the forestry sector do not generally offer a more diversified and adapted system of tenurial arrangements than can be seen in the rural development context.
- Some emerging trends are the allocation of forests to private households (China and

Viet Nam) and the interesting, but still limited and very recent granting of long-term agreements (100 years) to private companies (Malaysia).

- The forestry sector seems slow to adapt to current trends such as decentralization and greater stakeholder participation. Instead, it tends to react to shocks in extreme ways (e.g. logging bans), which further weaken tenure rights.
- In many countries, resource users and managers still have only a vague understanding of their roles, responsibilities and rights: poor management is often the result of limited knowledge and capacities.

Evidence emerging from the case studies demonstrates the linkage between clear and secure tenure arrangements and the contribution of forests to sustainable livelihoods and better management. While security of tenure is recognized as a founding block of effective forest management, it is not a sufficient condition. Secure forest tenure needs to be consolidated by effective capacity-building.

A strong recommendation emerging from the study is that awareness must be increased of the implications of forest ownership and tenure on forest management and poverty reduction. It is expected that FRA 2010 could contribute significantly to this goal.

[1] Bangladesh, Bhutan, Brunei, Cambodia, China, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Thailand and Viet Nam.
[2] China, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, Thailand and Viet Nam.

Information availability

Of the total of 229 countries and territories covered by FRA 2005, 157 (69 percent) have reported on ownership of forests, accounting for 77 percent of total forest area (Figure 7.6). The percentage is slightly lower for ownership of other wooded land.

The highest response rate was for Asia (93 percent) and Europe (84 percent), followed by Africa (62 percent), Oceania (47 percent) and North and Central America (45 percent). The lowest response rate was registered in South America, where only 40 percent of the countries were able to report, with important gaps such as Argentina, Brazil, Colombia and Venezuela.

Uncertainty in tenure-related issues, lack of up-to-date information, rapid changes, and the fact that forest ownership has been inserted only very recently into forest inventories affect the availability of reliable information. In addition, availability of data might be restricted to those countries that possess a rural cadastre, i.e. mainly developed countries. In many cases, owing to rapid evolution of the situations in eastern European countries and China, monitoring of trends is hindered by the difficulty and cost of obtaining current data. Data availability and trends also often vary greatly among regions and provinces in the same country.

Status

Most of the conclusions reported here are limited to forests (Table 7.8). Many countries including Australia and the United States provided data for ownership only of forests and not of other wooded land; therefore it is not possible to merge or compare the two categories. It can generally be said that no major differences in the ownership structure occur between the ownership of forests and other wooded land, at least at subregional and global scales.

Public ownership is by far the predominant category in all regions and subregions (Figure 7.7). At the global level, 84 percent of forests and 90 percent of other wooded land are public. Given that the 'public forest' category in FRA 2005 includes not only

forests owned by central, regional or local public bodies, but also those owned by groups (villages, communities and indigenous groups), it is difficult to draw conclusions about the management of public forests: many different categories are included under the same definition. Thus the most significant information is the percentage of private forests and its trend.

The highest percentage of private forests occurs in Central America (56 percent) and North America (29 percent). In Europe, private forests represent 10 percent. However, excluding the Russian Federation, they reach 51 percent. In Africa, private forests are uncommon.

FIGURE 7.6
Information availability – ownership

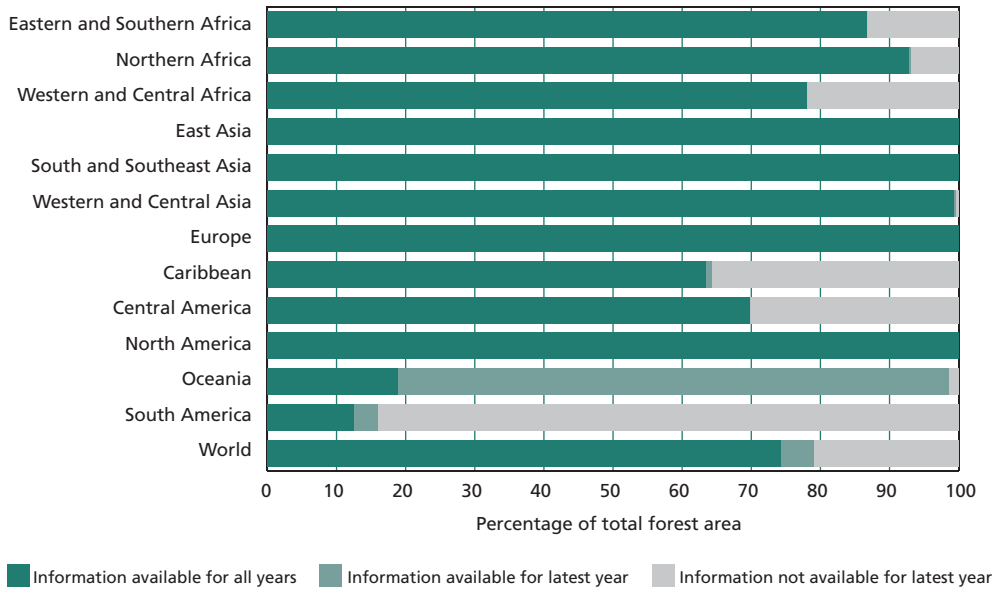
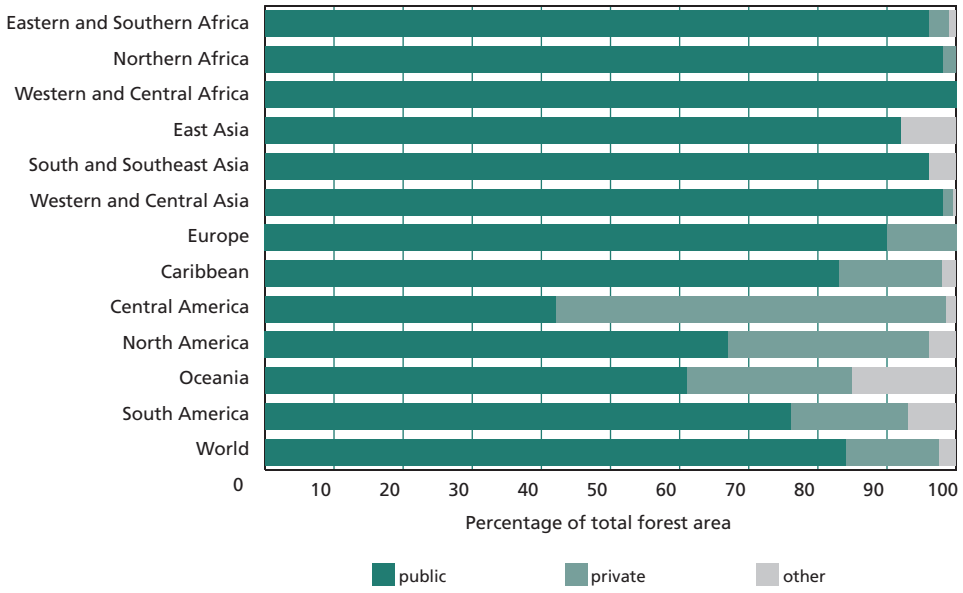


TABLE 7.8
Ownership of forest area 2000

Region/subregion	Information availability			Private ownership		Public ownership		Other ownership	
	Countries reporting	Forest area *(1 000)*	% of total forest area	1 000 ha	%	1 000 ha	%	1 000 ha	%
Eastern and Southern Africa	14	203 816	86.7	7 057	3.5	193 751	95.1	3 008	1.5
Northern Africa	12	126 452	93.0	2 124	1.7	124 209	98.2	119	0.1
Western and Central Africa	12	222 058	78.0	771	0.4	221 288	99.7	0	0
Total Africa	**38**	**552 326**	**84.3**	**9 951**	**1.8**	**539 248**	**97.6**	**3 127**	**0.6**
East Asia	5	225 663	100.0	18 875	8.4	206 788	91.6	0	0
South and Southeast Asia	17	297 379	100.0	8 835	3.0	285 478	96.0	3 066	1.0
Western and Central Asia	22	43 346	99.6	619	1.4	42 578	98.2	148	0.3
Total Asia	**44**	**566 388**	**100.0**	**28 329**	**5.0**	**534 845**	**94.4**	**3 214**	**0.6**
Total Europe	**39**	**998 071**	**100.0**	**99 631**	**10.0**	**897 059**	**89.9**	**1 380**	**0.1**
Caribbean	9	3 669	64.3	536	14.6	3 061	83.4	72	2.0
Central America	5	16 645	69.8	9 343	56.1	7 073	42.5	230	1.4
North America	4	677 971	100.0	198 645	29.3	452 343	66.7	26 982	4.0
Total North and Central America	**18**	**698 285**	**98.7**	**208 525**	**29.9**	**462 477**	**66.2**	**27 284**	**3.9**
Total Oceania	**11**	**204 933**	**98.5**	**48 575**	**23.7**	**125 527**	**61.3**	**30 831**	**15.0**
Total South America	**7**	**136 240**	**16.0**	**23 528**	**17.3**	**103 379**	**75.9**	**9 333**	**6.9**
World	**157**	**3 156 243**	**79.1**	**418 538**	**13.3**	**2 662 534**	**84.4**	**75 170**	**2.4**

FIGURE 7.7
Ownership of forests by subregion 2000



In terms of forest area, the regions or subregions accounting for the greatest area of private forests are North America (about 200 million hectares) and Europe (100 million hectares), followed by Oceania (49 million hectares).

Trends

Private ownership of forests is increasing, even though it is not possible to generalize the trend at the regional level (Table 7.9). Private forests represented 11 percent of global forests in 1990 and 13 percent in 2000. However, the increase involves limited geographical areas; the most relevant one is central Europe. There are no other significant trends at regional or subregional levels.

In the cases in which the proportion of private forests decreases, the phenomenon is generally linked to a decrease in the forest area (including public), not to a shift in forest ownership.

In Europe, private forests represented 8 percent of forests in 1990 and 9.7 percent in 2000 – an increase of 14 percent. Private forests have increased in almost all countries; however these changes are most significant in central and eastern Europe, where private forests increased from 2.5 million hectares to 7.5 million (i.e. from 7 percent to 23 percent of forest area) as a consequence of the privatization and restitution of forest land. The Baltic countries, the Czech Republic and Hungary show the highest rates of increase.

No conclusion can be drawn for Oceania, as Australia did not report data for 1990. However, private forests in New Zealand have increased to 33 percent, due primarily to an increase in the area of planted forests on private land.

In Asia, no major differences have been reported since 1990 for the region as a whole. At the country level, the only significant trends are the increased private forest area in the Philippines, mainly reflecting the expansion of forest plantations and despite the decrease in total forest area, and in Viet Nam, where private forests have increased by more than 2 million hectares as a result of the process of allocation of public forests to individual households (from 0.1 percent in 1990 to 18 percent in 2000 and 20 percent in 2005). No historical data are provided for China, which has also initiated a privatization process for forest resources.

TABLE 7.9
Trends in ownership of forest area 1990–2000

Region/subregion	Information availability (both years)			Private ownership		
				1 000 ha		Annual change rate 1990–2000
	Countries reporting	Forest area 2000	% of total forest area	1990	2000	(%)
Eastern and Southern Africa	14	203 816	86.7	7 555	7 057	-0.7
Northern Africa	11	126 135	92.8	2 189	2 116	-0.3
Western and Central Africa	12	222 058	78.0	690	771	1.1
Total Africa	**37**	**552 009**	**84.2**	**10 433**	**9 943**	**-0.5**
East Asia	5	225 663	100.0	19 147	18 875	-0.1
South and Southeast Asia	17	297 379	100.0	6 782	8 835	2.7
Western and Central Asia	21	43 215	99.3	528	540	0.2
Total Asia	**43**	**566 257**	**100.0**	**26 457**	**28 250**	**0.7**
Total Europe	**39**	**998 071**	**100.0**	**87 065**	**99 631**	**1.4**
Caribbean	8	3 623	63.5	646	505	-2.4
Central America	5	16 645	69.8	10 041	9 343	-0.7
North America	4	677 971	100.0	196 515	198 645	0.1
Total North and Central America	**17**	**698 239**	**98.7**	**207 202**	**208 494**	**0.1**
Total Oceania	**8**	**39 400**	**18.9**	**3 206**	**3 978**	**2.2**
Total South America	**5**	**106 360**	**12.5**	**12 038**	**23 478**	**6.7**
World	**149**	**2 960 336**	**74.2**	**346 402**	**373 773**	**0.8**

Note: As some countries did not report a complete series, figures for 2000 are slightly different from those presented in Table 7.8.

Finally, it is difficult to evaluate trends in Latin America, as not all countries have reported. The percentage of private forests has not changed in Chile, but has increased very significantly in Uruguay (58 percent) as a result of large-scale afforestation on private lands, encouraged by government incentives.

FOREST AREA DESIGNATED FOR SOCIAL SERVICES

The area of forests designated for social services indicates to what extent countries and forest managers are actively considering these services as part of the benefits of forests. According to the definitions for FRA 2005, social services may include recreation, tourism, education and conservation of sites with cultural or spiritual importance. The definition leaves space for interpretation by individual countries of what to include under this theme.

For FRA 2005, countries were asked to report two measures of forest designation:

- area of forest designated primarily for social services; and
- total area of forest designated for social services.

This is the first time that information on area designated for social services has been collected within the framework of the assessment. Thus it will be important to analyse carefully how the information provided by countries contributes to overall understanding of the use and functions of forest resources and how reporting can be further improved in future assessments.

Relatively few countries and territories (29 percent) reported having forest areas designated primarily for social services, and those that have reported are not necessarily representative of their entire region. This makes it difficult to draw any far-reaching conclusions on status and trends.

Information availability

Of the 229 countries and territories, 172 provided information on the social service function of their forests (Figure 7.8). Of these, only 66 countries and territories (representing about 53 percent of the world's forest area) reported actually having forest areas designated for social services, and only 60 countries have presented

Public ownership			Other ownership			Region/subregion
1 000 ha		Annual change rate 1990–2000	1 000 ha		Annual change rate 1990–2000	
1990	2000	(%)	1990	2000	(%)	
206 135	193 751	-0.6	3 292	3 008	-0.9	Eastern and Southern Africa
133 604	123 900	-0.8	94	119	2.4	Northern Africa
235 083	221 288	-0.6	0	0	0	Western and Central Africa
574 822	**538 939**	**-0.6**	**3 386**	**3 127**	**-0.8**	**Total Africa**
188 992	206 788	0.9	16	0	-100.0	East Asia
311 856	285 478	-0.9	4 507	3 066	-3.8	South and Southeast Asia
42 267	42 528	0.1	96	146	4.3	Western and Central Asia
543 115	**534 795**	**-0.2**	**4 619**	**3 212**	**-3.6**	**Total Asia**
902 051	**897 059**	**-0.1**	**183**	**1 380**	**22.4**	**Total Europe**
2 443	3 046	2.2	170	72	-8.2	Caribbean
9 147	7 073	-2.5	260	230	-1.2	Central America
452 227	452 343	n.s.	29 058	26 982	-0.7	North America
463 817	**462 461**	**n.s.**	**29 488**	**27 284**	**-0.8**	**Total North and Central America**
6 509	**6 219**	**-0.5**	**30 552**	**29 203**	**-0.5**	**Total Oceania**
60 590	**78 646**	**2.6**	**35 603**	**4 236**	**-19.2**	**Total South America**
2 550 904	**2 518 119**	**-0.1**	**103 831**	**68 443**	**-4.1**	**World**

complete trend data. The remaining countries and territories may still have areas designated for social services, but these are either included in other categories, such as 'multiple use', or could not be quantified.

There is considerable regional variation regarding data availability. East Asia, Europe and South America have good availability of information, while data are largely missing from the remaining subregions. For North America, no data are available for primary function, and only one reporting unit – Saint Pierre and Miquelon – has reported on total area of forest designated for social services.

Status

Table 7.10 shows a subregional summary of areas designated primarily for social services. Out of the total of 141 million hectares reported, one country – Brazil – accounts for about 80 percent, or 114 million hectares. It has reported all its 'indigenous lands' and 'sustainable development reserves' in this category. At the global level, 3.7 percent of forest area (1.7 percent if excluding Brazil) is estimated as having social services as the primary function. This percentage increases to 30.9 percent when looking at total area with this function.

As the Russian Federation accounts for most of the forest area in Europe, figures are provided for Europe including and excluding the Federation. It is worth noting that, without the Russian Federation, the forest area designated for social services in Europe is 8.3 percent of total forest area, which is a considerably higher percentage than for all other regions with the exception of South America, because of the large areas reported by Brazil.

Under total area with function (Table 7.11), Europe reports about 72 percent of its forest area. The high percentages for North America (100 percent) and Oceania (88 percent) are based on a few small countries that are not representative of the subregions.

The only clear conclusion to be drawn is that Europe seems to give the most attention to the social services provided by forest resources, through active designation of areas for this purpose. However, clearer definition of social services in future assessments could help reduce the inconsistencies caused by differing interpretations by the countries reporting.

FIGURE 7.8
Information availability – area of forest designated primarily for social services

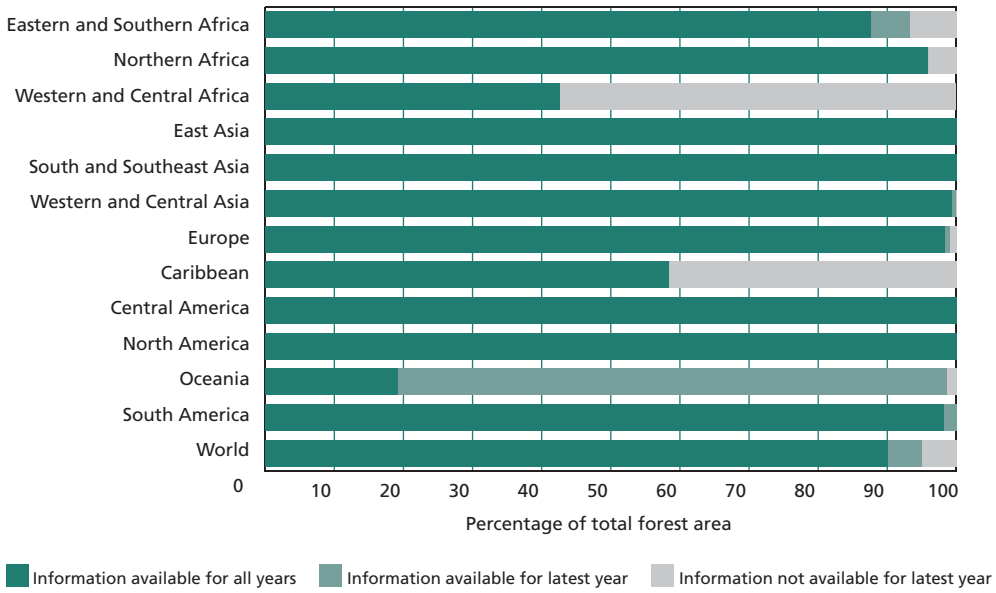


TABLE 7.10
Area of forest designated primarily for social services 2005

Region/subregion	Information availability			Area of forest designated primarily for social services	
	Countries reporting	Forest area *(1 000 ha)*	% of total forest area	1 000 ha	% of forest area
Eastern and Southern Africa	16	211 181	93.2	12	n.s.
Northern Africa	13	125 667	95.9	2	n.s.
Western and Central Africa	15	118 280	42.6	364	0.3
Total Africa	**44**	**455 129**	**71.6**	**377**	**0.1**
East Asia	5	244 862	100.0	2 620	1.1
South and Southeast Asia	17	283 126	100.0	143	0.1
Western and Central Asia	23	43 579	100.0	906	2.1
Total Asia	**45**	**571 567**	**100.0**	**3 669**	**0.6**
Total Europe	**36**	**991 192**	**99.0**	**22 477**	**2.3**
Caribbean	9	3 489	58.4	3	0.1
Central America	7	22 411	100.0	36	0.2
North America	4	677 464	100.0	0	0
Total North and Central America	**20**	**703 364**	**99.7**	**39**	**n.s.**
Total Oceania	**14**	**203 467**	**98.7**	**67**	**n.s.**
Total South America	**13**	**831 540**	**100.0**	**113 971**	**13.7**
World	**172**	**3 756 260**	**95.1**	**140 600**	**3.7**

Trends

The analysis of trends in area of forests primarily designated for social services is based on those countries or territories that have reported a complete time series (Table 7.12).

The strong trend for South America is entirely due to the reclassification by Brazil. Europe shows a decline under primary function, but a small increase under total area with function. The decline is mostly the result of reclassification of forests in the Russian Federation. Asia shows a slight upward trend, while the number of reporting countries in Africa, North and Central America and Oceania is too small to support a statement regarding trend.

TABLE 7.11
Total area of forest designated for social services 2005

Region/subregion	Information availability			Total area of forest designated for social services	
	Countries reporting	Forest area *(1 000 ha)*	% of total forest area	1 000 ha	% of forest area
Eastern and Southern Africa	2	77	n.s.	14	18.2
Northern Africa	0				
Western and Central Africa	4	45 840	16.5	293	0.6
Total Africa	**6**	**45 917**	**7.2**	**307**	**0.7**
East Asia	5	244 862	100.0	46 959	19.2
South and Southeast Asia	15	193 833	68.5	96 369	49.7
Western and Central Asia	7	8 427	19.4	2 896	34.4
Total Asia	**27**	**447 122**	**78.2**	**146 223**	**32.7**
Total Europe	**16**	**124 526**	**12.4**	**89 734**	**72.1**
Caribbean	3	524	8.8	130	24.9
Central America	0				
North America	1	3	n.s.	3	100.0
Total North and Central America	**4**	**527**	**0.1**	**133**	**25.3**
Total Oceania	**5**	**10 215**	**5.0**	**8 954**	**87.7**
Total South America	**2**	**485 761**	**58.4**	**128 763**	**26.5**
World	**60**	**1 114 068**	**28.2**	**374 116**	**33.6**

TABLE 7.12
Trends in area of forest designated primarily for social services 1990–2005

Region/subregion	Information availability (all 3 years)			Area of forest designated primarily for social services			Annual change rate *(%)*	
	Countries reporting	Forest area *(1 000 ha)*	% of total forest area	1990	2000	2005	1990–2000	2000–2005
Eastern and Southern Africa	15	198 343	87.6	12	12	12	0	0
Northern Africa	13	125 667	95.9	1	2	2	3.8	1.0
Western and Central Africa	15	118 280	42.6	367	371	364	0.1	-0.4
Total Africa	**43**	**442 291**	**69.6**	**380**	**384**	**377**	**0.1**	**-0.4**
East Asia	5	244 862	100.0	1 506	2 184	2 620	3.8	3.7
South and Southeast Asia	17	283 126	100.0	127	138	143	0.8	0.7
Western and Central Asia	21	43 272	99.3	1 445	702	906	-6.8	5.3
Total Asia	**43**	**571 259**	**99.9**	**3 078**	**3 023**	**3 669**	**-0.1**	**4.0**
Total Europe	**34**	**984 468**	**98.3**	**29 874**	**22 118**	**22 434**	**-3.0**	**0.3**
Caribbean	9	3 489	58.4	3	3	3	0	0
Central America	7	22 411	100.0	36	36	36	0	0
North America	4	677 464	100.0	0	0	0	0	0
Total North and Central America	**20**	**703 364**	**99.7**	**39**	**39**	**39**	**0**	**0**
Total Oceania	**11**	**39 593**	**19.2**	**60**	**60**	**60**	**0**	**0**
Total South America	**12**	**816 436**	**98.2**	**7 076**	**43 702**	**113 612**	**20.0**	**21.1**
World	**163**	**3 557 412**	**90.0**	**40 507**	**69 326**	**140 191**	**5.5**	**15.1**

Note: As some countries did not report a complete series, figures for 2005 are slightly different from those presented in Table 7.10.