



Chapter 7

Socio-economic functions of forest resources

OVERVIEW

Forests provide a wide variety of social and economic benefits, ranging from easily quantified economic values associated with forest products, to less tangible services and contributions to society. In order to measure progress towards the implementation of sustainable forest management, it is necessary to monitor changes in the outputs provided by forest management in social and economic, as well as environmental, dimensions. This chapter presents statistics about the economic and social benefits of forest management, as well as information about the ways in which forests are managed from a social and economic perspective.

The economic benefits of forest management can be calculated directly as the quantity of outputs (products and services) produced by forests, each multiplied by an appropriate value then added together. For many outputs, market prices can be used as an estimate of value. However, it is more difficult to estimate values for subsistence uses of forest products or for outputs that are not bought and sold in markets.

The social benefits of forests are much more difficult to measure because the amount and value of these contributions to society are both difficult to quantify. In this case, indirect measures are often used to allow trends to be quantified and monitored over time.

This chapter starts by describing two ways in which forest management is changing. First, recent trends in forest ownership and management rights are described. Second, the fiscal measures that governments use to provide support to forest management and collect fees and charges from the sector are outlined. This information is important in understanding the changing roles of government and citizens in the sector. It then presents the current status and trends for an indicator of the economic benefits of forestry – the value of wood and NWFP removals; and two social indicators – employment in forestry and the area of forests designated for social services (an indirect measure of social benefits).

Information was collected from all countries on ownership and management rights of forests by local communities, and the formal employment opportunities offered by forests. To complement this, a special study is underway to highlight the links between forests, poverty and livelihoods. A short summary of this study is provided in Box 7.1.

KEY FINDINGS

Eighty percent 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 towards the involvement of communities, individuals and private companies in the management of publicly owned forests.

BOX 7.1

FRA 2010 special study on forestry, poverty and livelihoods

There is increasing interest in the role that forests play in supporting the poor, in reducing their vulnerability to economic and environmental shocks, and in reducing poverty. However, the contribution that forests actually make to poverty reduction and increasing the livelihood resilience of the poor is often obscure for policy-makers in key ministries, including finance, planning and local government, and the supra-ministerial bodies where poverty reduction strategy processes are often located. There is a tendency to underestimate the contribution of forests – and off-farm natural resources in general – to livelihoods, and the role of forests in poverty reduction has so far not been reflected in any significant way in national level strategy in most countries.

On the forestry side, reporting has typically been focused on the physical resource and its status and extent. Such reporting sheds no light on the contributions made by forests to the lives of the poor. Ministries responsible for forestry have only moved very slowly towards collecting new kinds of data to meet this challenge. Their previous experience has not prepared them for this task and they need to be supported to deal effectively with the new requirements.

To address this issue FAO is developing ways of collecting and incorporating data about the reliance of local people on forests, and the value of those forests to them, into future Global Forest Resource Assessments. It will become essential for countries to learn how to assess this aspect of the value of forests, which will greatly increase the visibility and profile of the sector in poverty reduction.

In partnership with IUCN, the Center for International Forestry Research and the Program on Forests of the World Bank, FAO will undertake a pilot study to test methods in three countries: Uganda (Africa), Viet Nam (Southeast Asia) and a third country in Central America (possibly Guatemala). Field work in the three countries will help establish a baseline from which the contribution of forests to livelihood resilience and poverty reduction can be derived. The field work will use the most recent census in each country and apply agreed wealth or poverty criteria to all villages in all districts where forests exist. A more detailed assessment will then be undertaken in a sample of villages throughout the country. Finally, guidance will be provided to governments on ways of establishing low cost data collection methods that illuminate the value of forests to local livelihoods and poverty reduction.

By June 2011 the study is expected to provide an assessment of the reliance of local people on forests and the value of forests to them; and a rough national level picture of the links between poverty and forests, extrapolated from village-level studies.

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.

The value of wood removals is high, but fluctuating

Wood removals were valued at just over US\$100 billion annually in the period 2003–2007. Industrial roundwood accounted for most of this value. At the global level the reported value of wood removals showed no change between 1990 and 2000, but increased by about 5 percent annually over the period 2000–2005. This suggests that roundwood prices recovered somewhat from their decline (in real terms) in the decade 1990–2000. However, since 2005 they have fallen sharply.

The value of NWFPs remains underestimated

The reported value of NWFP removals amounts to about US\$18.5 billion for 2005. Food products account for the greatest share of this. However, information is still missing from many countries where NWFPs 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 NWFPs.

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 the management of protected areas. Given that much forestry employment is outside the formal sector, forest work is certainly much more important for rural livelihoods and national economies than the reported figures suggest.

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

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

KEY CONCLUSIONS

The poor availability of data makes it very difficult to draw any conclusions about increasing or decreasing trends in the importance of forests' socio-economic functions. However, it appears that the main economic benefits of forests (employment and value of outputs) may be static or declining, while the social and cultural benefits could be increasing. This very broad shift towards non-market outputs of forests seems to concur with national and international policy debates about forests and forestry, where social and environmental aspects are always very high on the agenda. It is also consistent with the information collected about forest ownership and government involvement in the sector, which shows a gradual shift towards less public ownership in most countries and regions and slightly more net public expenditure on forestry.

It will always be difficult to quantify and collect information about social and environmental functions, but they represent some of the main outputs from forests and it is recommended that the FRA process should continue to collect this information in future.

OWNERSHIP AND MANAGEMENT RIGHTS

Introduction

Since 2005, information about forest ownership and management rights (or forest tenure) has been included in the FRA as one indicator of the socio-economic functions of forests. Compared with the previous assessment, FRA 2010 includes more information about different types of private ownership (e.g. individual, corporate and community/indigenous) as well as new information about who manages public forests.

This expanded dataset significantly improves the quality and the usefulness of the information collected.²²

It is commonly assumed that ‘secure tenure’ enables or provides incentives for people to invest time and resources in forest management (FAO, 2006e, 2008b, 2009c; Sunderlin, Hatcher and Liddle, 2008). Access to data on forest tenure (including changes and trends) is therefore a fundamental prerequisite for any country in designing and adopting effective and secure tenure arrangements that can help to reduce deforestation and forest degradation. This is especially true where changes in resource tenure patterns are increasing the complexity of relationships between stakeholders.

Status

Of the 233 countries and areas covered by FRA 2010, 188 reported on forest ownership for 2005 in the main categories (public, private and other). These 188 countries accounted for 99 percent of the total forest area (compared with 77 percent in FRA 2005).

In 2005, 80 percent of the global forest area was publicly owned, 18 percent was privately owned and 2 percent was classified as ‘other’ ownership, including unknown and disputed ownership (Table 7.1).

Public ownership was predominant in all regions and subregions. Europe excluding the Russian Federation was the exception to this, where public ownership accounted for less than half (46 percent) of the forest area²³ (see Figure 7.1). Public ownership was also by far the most common form of ownership in many of the countries with high forest cover, such as Brazil, Democratic Republic of the Congo, Indonesia and the Russian Federation. Private ownership was more common in North America (31 percent), Central America (46 percent) and Oceania (37 percent). It was also significant in South America (21 percent) and East Asia (33 percent), due to high levels of private ownership in a few countries such as Chile, Colombia, Paraguay and China.

Figure 7.2 shows private forest ownership by type of forest owner in 2005. Far fewer countries reported this information, with reporting countries covering 55 percent of the forest area globally and only 16 percent in Asia (the region with the lowest rate of response). Fewer countries also reported forest ownership for the entire time series (1990–2000–2005).

TABLE 7.1
Forest ownership by region, 2005

Region	Information availability		Forest area by ownership					
	Number of countries reporting	% of total forest area	Public		Private		Other	
			1 000 ha	%	1 000 ha	%	1 000 ha	%
Africa	49	97.0	634 571	94.6	25 710	3.8	10 487	1.6
Asia	46	100.0	475 879	81.5	107 520	18.4	640	0.1
Europe	45	100.0	897 463	89.6	101 817	10.2	1 847	0.2
North and Central America	22	99.4	432 307	61.7	222 799	31.8	46 040	6.6
Oceania	13	99.7	121 316	61.9	72 677	37.1	2 088	1.1
South America	13	96.5	641 505	75.3	180 602	21.2	29 552	3.5
World	188	98.6	3 203 040	80.0	711 125	17.8	90 654	2.3

²² It should be noted that this data refers to the ownership of forests and trees rather than the ownership of forest.

²³ Including the Russian Federation in Europe, public ownership was almost 90 percent, because all forest in the Russian Federation is publicly owned.

FIGURE 7.1
Forest ownership by subregion, 2005

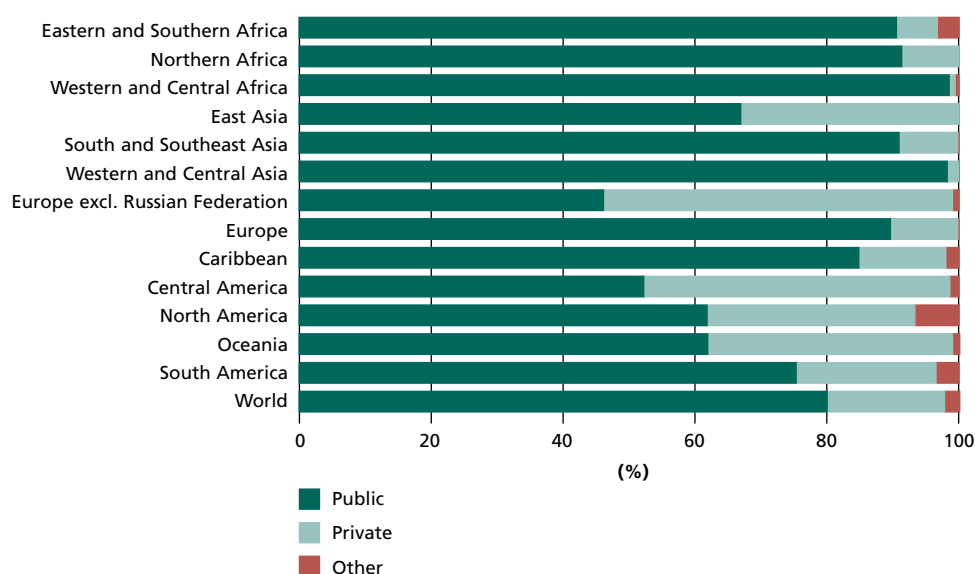
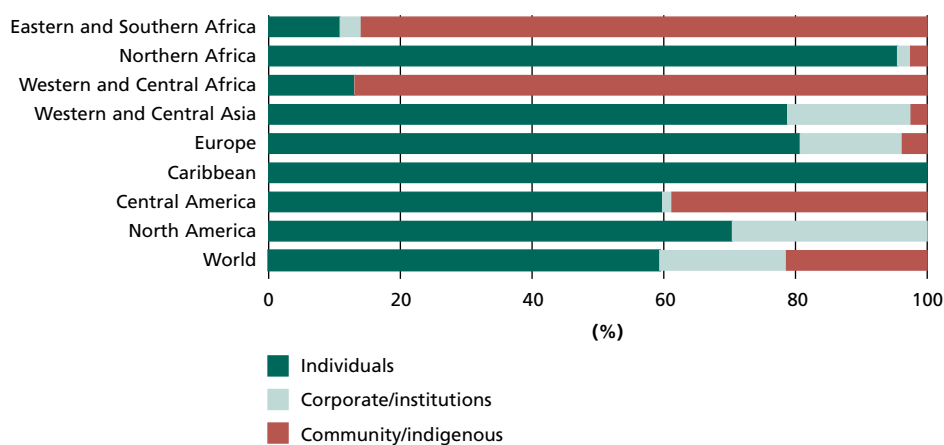


FIGURE 7.2
Private forest ownership by type of forest owner and subregion, 2005



Note: This figure only includes subregions where information covered more than 25 percent of the total forest area.

This limited information gives only an imprecise indication of private forest ownership at the global and regional levels. However, the countries reporting this information indicated that 59 percent of private forests were owned by individuals, 19 percent by private corporations and institutions, and the remaining 21 percent by local communities and indigenous people. At the regional level, individual ownership was dominant in most regions and corporate ownership was also significant in North America, Europe (excluding the Russian Federation) and Western and Central Asia.

Communities and indigenous people owned the majority of private forests in sub-Saharan Africa, although this is insignificant in terms of total forest area (around one percent of the total area), because almost all forest in these countries is owned by the state. Communities and indigenous people also owned a significant share of private

forests (and total forest area) in Central America as a whole (44 percent) because of the situation in a few countries such as Guatemala and Honduras.²⁴

Publicly owned forests may be managed by the state, communities, individuals or the private sector. Figure 7.3 shows who was responsible for management of public forests at the global and subregional levels. This information was reported by 152 countries (accounting for 92 percent of total forest area) for 2005 and 130 countries (80 percent of total forest area) reported the entire time series. These figures therefore give a fairly good, albeit partial, picture of who manages public forests across the world.

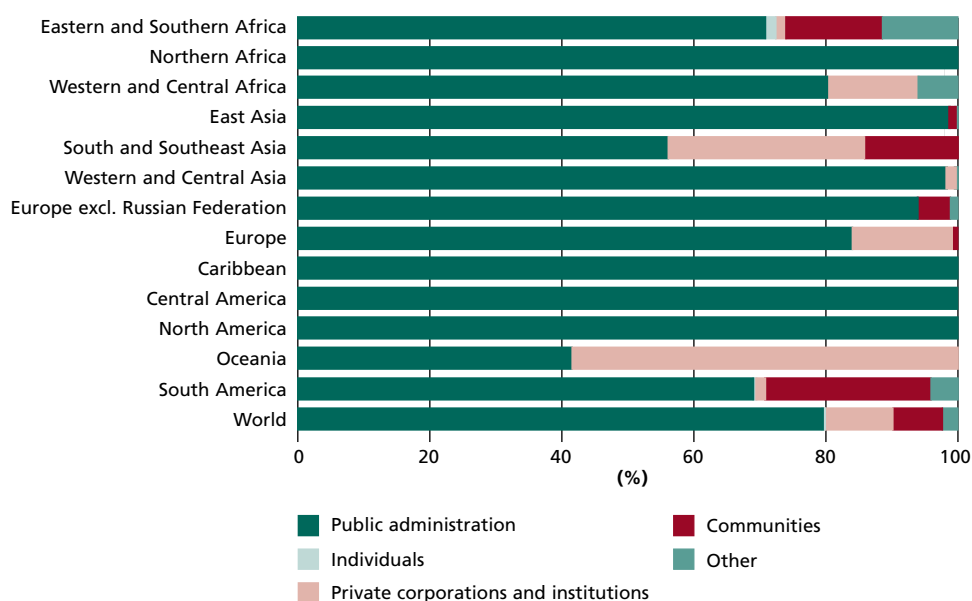
At the global level, the state retains management responsibilities in about 80 percent of public forests, followed by private corporations and institutions (10 percent), and communities (7 percent). Private corporations and institutions were particularly important in a few regions and subregions, such as Oceania, South and Southeast Asia and Western and Central Africa, because of their large influence in countries such as Australia, Indonesia and those of the Congo Basin. In these regions and subregions, private companies were responsible for forest management in 58, 30 and 14 percent of public forests respectively.

In South America, private corporations and institutions did not manage much public forest, although this is expected to increase in the future as a result of the forest concession law introduced in 2006 in Brazil. However, community management of public forests was very common in South America (e.g. in Brazil) and in South and Southeast Asia (e.g. in India and the Philippines).

Trends

At the global level, the area of forest under public ownership decreased by 141 million hectares, or about 0.3 percent annually between 1990 and 2005, while the area of forest under private ownership increased by 113 million hectares or almost 1.5 percent per

FIGURE 7.3
Management of public forests by subregion, 2005



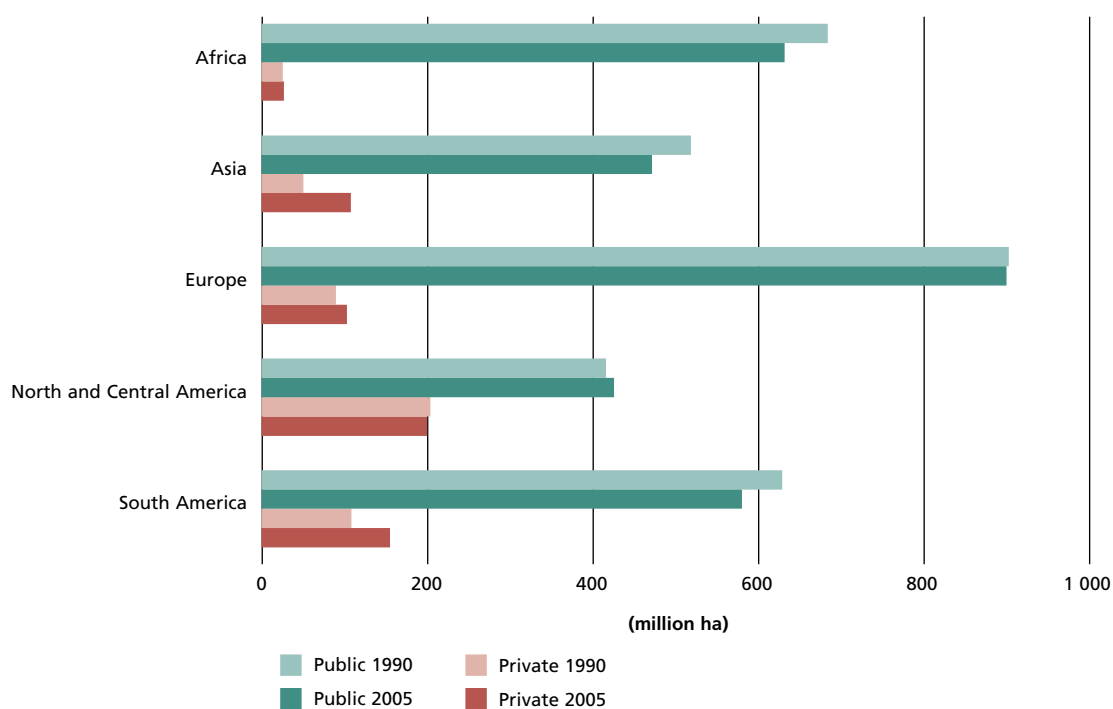
²⁴ It should also be noted that 70 percent of forests in Mexico are owned by 'ejidos' (local communities), but this is not shown here because these were classified as 'other forms of ownership'.

year on average. It is likely that the increase in privately owned forests mostly occurred in planted forests rather than natural forest as this is the main means of acquiring private forest ownership in many countries. It is not possible to say how much of the reduction in the area of publicly owned forests is due to changes in ownership itself or to a reduction of the total forest area but the latter seems more likely in many cases. However, the area of privately owned forests has increased over the past 15 years in both Asia and South America as a result of significant increases in countries such as China and Colombia. In contrast, it only increased very slightly in Africa and declined in North and Central America (see Figure 7.4). The reason for the decline of privately owned forests in North America is a move towards more public ownership of forests in the United States of America in line with long term restoration and conservation strategies.

Due to the lack of data, it is not possible to examine trends in the different types of private ownership over time, but it is possible to show the changes in the management of public forests over the last 15 years (see Figure 7.5).

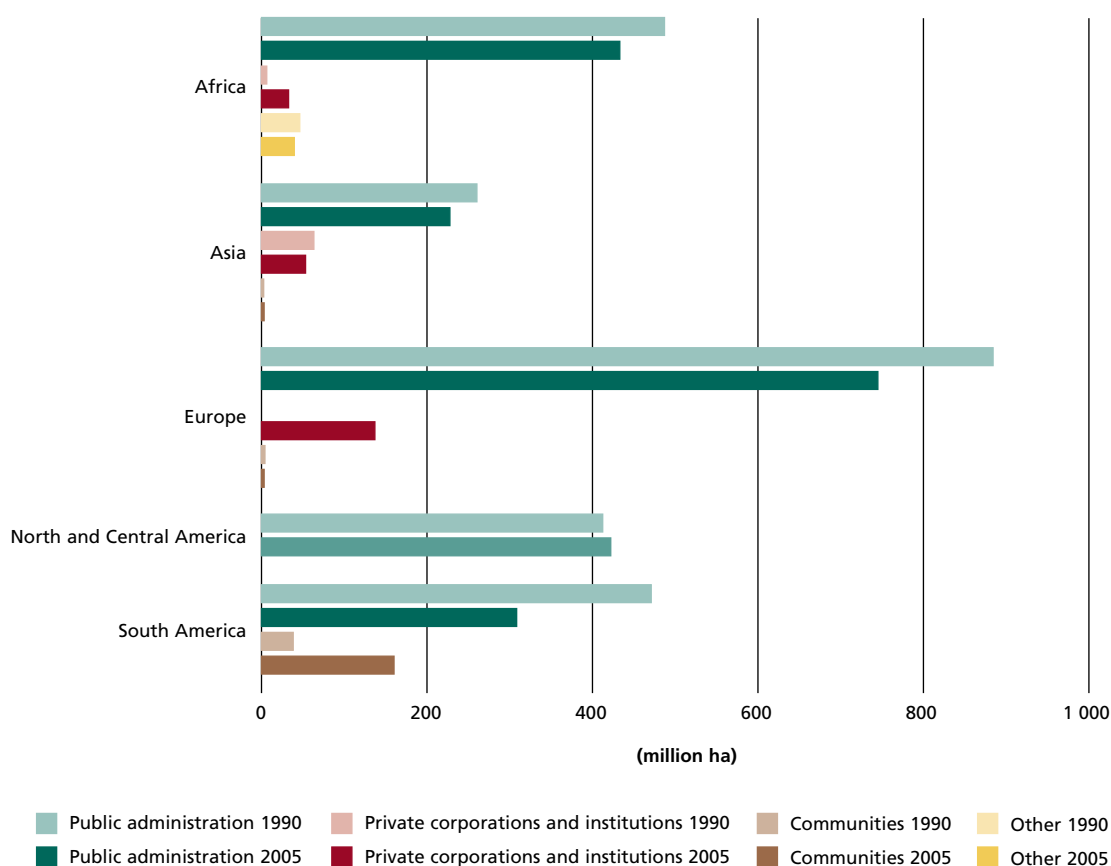
A reduction in state forest management and an increase in private sector management were seen in Europe (largely because of the Russian Federation, where private sector management increased from zero in 1990 to 137 million hectares in 2005) and in Africa. A shift from state management to management by local communities occurred in South America. Less evident are the change rates in Asia: both state and corporate management have decreased, but this appears to be linked to a reduction in the forest area of the reporting countries (data were missing from China) rather than a greater role for local communities in managing the public forests. Finally, although the role of local communities has increased in percentage terms in Africa, the area of public forest managed by local communities is still very small in this region.

FIGURE 7.4
Trends in public and private ownership of forests by region, 1990–2005



Note: Oceania not shown due to low level of information availability

FIGURE 7.5
Trends in management of public forests by region, 1990–2005



Note: Oceania is not shown because of a low level of data availability.

Conclusions

The increased number of reporting countries compared to FRA 2005 is encouraging and might indicate that countries are becoming more aware of the importance of gathering forest tenure data as a basis for the development and implementation of policy and legislation.

Public ownership remains the predominant ownership category in all regions and at the global level, although the area of forest under public ownership has declined in the past 15 years. The most notable changes at the regional level are the increased devolution of management responsibilities from the state to the private sector – especially in Central Africa and the Russian Federation – and to local communities in South America and Southeast Asia. Furthermore, it is expected that major shifts in forest ownership and management will continue as a consequence of forest tenure reform in China (in favour of private ownership by individuals and families) and possibly in Latin America (with the growing role of the private sector in Brazil). In Africa, the role of the state remains dominant with some management rights devolved to private corporations in the high forest cover countries of Central Africa and to communities in Eastern and Southern Africa.

PUBLIC EXPENDITURE AND REVENUE COLLECTION

Introduction

Public expenditure and revenue collection from forestry are measures of the financial flows between government and the forestry sector. In FRA 2010 forest revenue was defined to include all taxes, fees, charges and royalties collected specifically from the domestic production and trade of forest products, but it excluded general taxes collected from all sectors of the economy (e.g. corporation tax and sales tax). Public expenditure included expenditure on forestry activities by all relevant public institutions and was divided into operational expenditure and transfer payments²⁵, with each of these types of expenditure divided by source of funding (domestic or external). Countries were also asked to exclude the income and expenditure of publicly-owned businesses in their reports (FAO, 2007h).

Forest revenue can be interpreted in two ways, depending on the arrangements for forest management in a country. In countries where large areas of forest are owned or managed by the state and are used for commercial production, forest revenue can be an indicator of the economic benefit of forest management (i.e. the income, rent or profit to the state as forest owner). A more general interpretation is that forest revenue is an indicator of the contribution of forestry activities to public finances. This is a broader indicator of the economic benefit of the sector as a whole, which is particularly useful when it is compared to public expenditure to show the net financial flow between government and the forestry sector. Data on forest revenue may indicate how the economic benefits of forestry change over time, but comparisons between countries should be interpreted carefully because forest revenue can be affected by numerous factors, such as the actual or potential market value of forest resources, forest management objectives and the ability of governments to collect revenue (FAO, 2003).

Public expenditure on forestry is a partial indicator of the level of government influence over forestry activities in a country. In broad terms, governments have four different sets of instruments to implement public policies: regulations; fiscal policies (e.g. transfer payments and tax regimes); direct action (e.g. public expenditure directly on forest management); and activities to facilitate or encourage changes in behaviour (e.g. awareness raising activities). With the exception of preferential tax treatment and, to some extent, direct action²⁶, the information collected about public expenditure indicates how much governments spend on the different types of instruments listed above.

The division of this information into operational expenditure and transfer payments gives a very rough indication of the relative emphasis given to regulation and facilitation (operational expenditure) and transfer payments. Furthermore, it is likely that expenditure on regulation is much higher than expenditure on facilitation, so this information gives a broad indication of how much governments try to restrict behaviour (i.e. through regulations) as opposed to their efforts to try to encourage certain types of behaviour through financial incentives (i.e. transfer payments).

The information about the sources of funding for public expenditure gives an indication of the reliance of countries on foreign assistance for the implementation of their forestry policies, programmes and projects. The total amount of funding from

²⁵ Transfer payments are payments by government to support forestry activities by non-state individuals, companies and institutions. These include, for example, grants for afforestation and forest management, and subsidies for employment, tools and materials.

²⁶ The extent to which expenditure on direct action is included in the data collected for FRA 2010 depends on whether countries implement such actions through government-owned business entities (e.g. state forest enterprises) or more directly through the forest administration (e.g. civil service). The intention in FRA 2010 was to exclude income and expenditure on direct action from the data supplied by countries, but it was not easy to describe this in the definitions used for FRA 2010 and it is likely that some countries have included such expenditure in their replies.

external sources gives a partial indication of the amount of development assistance for forestry. However, it only includes funding that is provided to governments. It does not include assistance in-kind and development assistance that is provided through non-governmental institutions. Therefore, it is an underestimate of total foreign assistance to the sector.

As noted above, this information is only a partial indicator of the investments and returns to forest management in a country, but it is a slightly better indicator of the amount of government intervention in the sector and the main instruments that governments use to try to influence forestry activities. Thus, it provides useful information about some of the economic aspects of governments' progress towards sustainable forest management and it should be interpreted in this context rather than as a measure of the outputs from the sector.

Status

Estimates of forest revenue and public expenditure were collected for the years 2000 and 2005 and the figures for 2005 are shown in Table 7.2 and Table 7.3, while Figure 7.6 and Figure 7.7 show forest revenue and public expenditure per hectare of forest by country. Over 100 countries supplied this information, with countries reporting revenue collection accounting for 79 percent of the global forest area and those reporting expenditure accounting for 64 percent of the area. Thus, the figures present only a partial estimate of global revenue collection and expenditure on forestry, but the reporting countries account for a significant share of global forest resources. The countries with significant forest areas that were unable to supply some of this information included Australia, Canada, Democratic Republic of the Congo, Finland, France, Germany, Indonesia and New Zealand, but many of these provided at least partial information.

Total forest revenue collection in 2005 was US\$14.6 billion, which is equivalent to about US\$4.60 per hectare or US\$6.10 per cubic metre of wood production.²⁷ Revenue collection in the different regions was roughly in proportion to their forest areas, resulting in similar figures for revenue collection per hectare in each region. The one major exception was Africa, where revenue collection was very low at

TABLE 7.2
Forest revenue collection by region, 2005

Region	Information availability		Forest revenue in 2005					
	Number of countries	% of total forest area	Total		Revenue per ha (US\$)		Revenue per m ³ (US\$)	
			Million US\$	%	All areas	Public area	All removals	Adjusted ²
Africa	31	63	285	2	1	1	1.24	6.85
Asia	22	88	2 846	19	5	7	4.31	18.92
Europe	20	89	5 420	37	6	6	13.39	17.72
North and Central America ¹	14	90	2 620	18	4	6	3.40	5.56
Oceania	7	20	146	1	4	23	5.33	33.24
South America	7	76	3 290	23	5	6	10.80	26.50
World	101	79	14 607	100	5	6	6.09	12.34

Notes:

¹ These figures use revenue figures for 2000 for the United States of America (2005 not available).

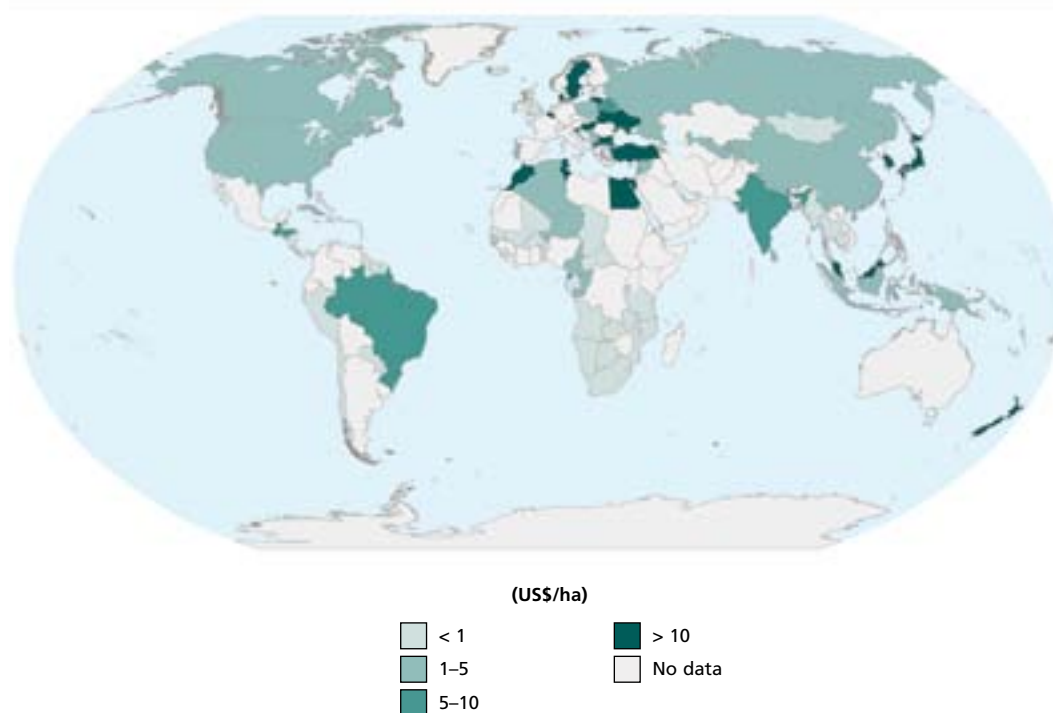
² Excludes fuelwood production and production from private forests (based on share of total forest area).

²⁷ All figures per hectare and per cubic metre were calculated by dividing total revenue or expenditure by the area of forest or amount of production in those countries reporting revenue or expenditure.

TABLE 7.3
Public expenditure on forestry by region, 2005

Region	Information availability		Public expenditure on forestry in 2005			
	Number of countries	% of total forest area	Total		Expenditure per ha (US\$)	
			Million US\$	%	All area	Public area
Africa	26	46	625	3	2.04	2.15
Asia	22	51	6 766	36	22.46	30.09
Europe	28	94	5 137	27	5.45	5.85
North and Central America	13	55	6 303	33	16.28	43.96
Oceania	6	16	15	0	0.51	16.21
South America	8	73	166	1	0.26	0.35
World	103	64	19 012	100	7.31	9.47

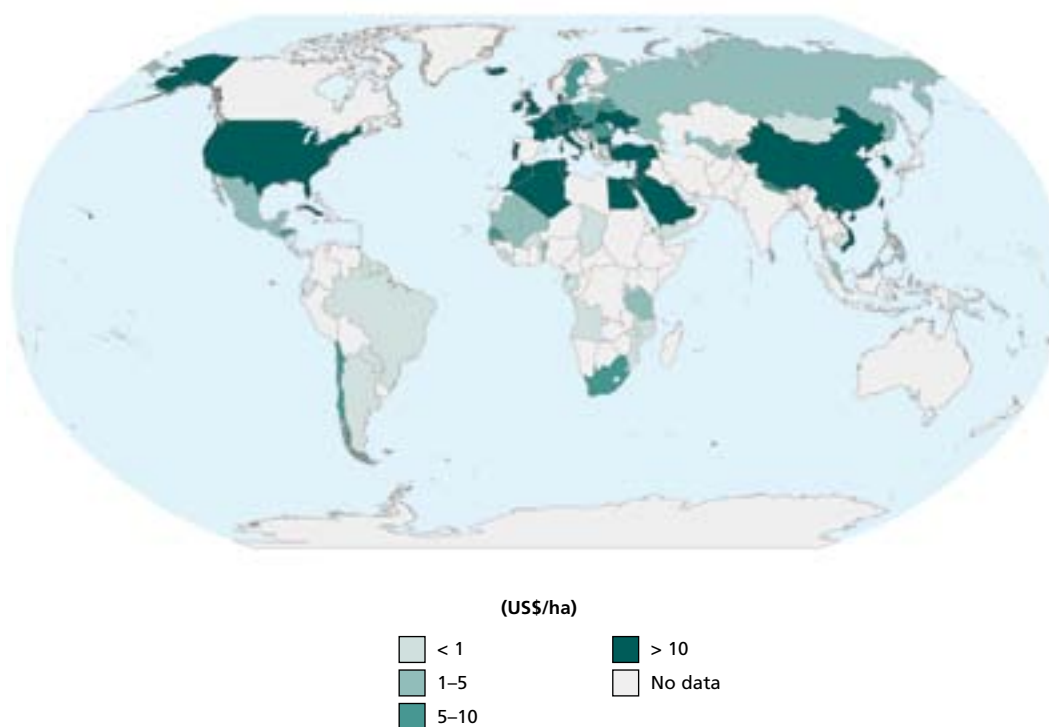
FIGURE 7.6
Forest revenue collection by country, 2005



only US\$285 million in total or US\$0.67 per hectare on average. Furthermore, three countries (Cameroon, Morocco and the Republic of the Congo) accounted for about two-thirds of reported revenue collection in Africa, indicating that revenue collection in the other reporting countries is extremely low.

If it is assumed that most forest revenue is collected from the use of state-owned forest resources, then the global average for revenue collection per hectare is slightly higher at US\$5.60. The one region where this figure was much higher is Oceania. This is because in Papua New Guinea the government collects a significant amount of forest revenue but most of the forest is owned by traditional landowners. Similarly, revenue collection per cubic metre of wood production is higher if fuelwood production is excluded and it is assumed that this is mostly collected from production in state-

FIGURE 7.7
Public expenditure on forestry by country, 2005



owned forests. However, these figures (shown in the last column of Table 7.2) are very imprecise, because the exact amount of production from state-owned forests was not collected in FRA 2010.

Total public expenditure on forestry in 2005 was just over US\$19 billion, with most of this expenditure in Asia, Europe and North and Central America. Average expenditure per hectare was US\$7.31, but expenditure per hectare was much higher in Asia and North and Central America. The figure for Europe was lower than the global average due to the inclusion of the Russian Federation in this region (which has a vast forest area and relatively low expenditure per hectare). Excluding the Russian Federation, expenditure per hectare in the rest of Europe would be very high (US\$30.95 per hectare).

Public expenditure on forestry in Africa was relatively low, but expenditures in Oceania (US\$0.51 per hectare) and South America (US\$0.26 per hectare) were even lower. These low figures were caused by the dominance of Papua New Guinea and Brazil in the calculation of the regional averages, as both countries have comparatively large forest areas resulting in very low expenditure per hectare. In the case of Papua New Guinea the low figures per hectare may also be explained by the fact that most of the forest area is under private (communal) ownership.

Again, if it is assumed that the majority of public expenditure is devoted to the management of state-owned forests, then total expenditure divided by the area of forests in public ownership results in a higher estimate of expenditure per hectare (with a global average of US\$9.47 per hectare). However, some of this expenditure is used to support forestry in the private sector or to fund administration and other regulatory activities, so this is not a very reliable estimate of investment in forest management in state-owned forests.

Table 7.4 shows the sources of funding (domestic and external) and the uses of public expenditure on forestry in 2005. As the table shows, the majority of public expenditure on forestry came from domestic sources and the amount of external funding was only US\$699 million, or about 4 percent of the total. As might be expected, Africa had the highest contribution of external funding to public expenditure on forestry at US\$175 million (28 percent of the total). Europe also had a relatively high proportion of external funding. This is because some public expenditure on forestry in member states of the European Union comes from common funds administered by the European Commission.

The distribution of expenditure between operational expenditure and transfer payments was very variable between regions, with transfer payments accounting for about 43 percent of all expenditure at the global level. Transfer payments were comparatively high in Asia, Europe and South America, but much lower in the other three regions. This is probably partly due to expenditure on support for establishment of planted forests as well the higher levels of private forest ownership in many countries in these regions.

All the data collected showed considerable variation between countries in revenue collected and public expenditure per hectare of forest. This is due to various factors such as the difference in forest types in different countries, but also their different levels of economic development (more developed countries are generally able to spend more on forestry than poorer countries). To demonstrate this variation, Lorenz curves were constructed that show how revenue collection and public expenditure are distributed across the global forest resource. These curves were calculated separately for the countries reporting revenue collection and public expenditure and are shown in Figure 7.8 and Figure 7.9.

In Figure 7.8, the distribution of revenue collection shows that very little forest revenue is collected in 46 countries accounting for about 20 percent of the forest area (of all countries reporting revenue collection). Revenue collection in these countries is less than US\$1 per hectare. In another 29 countries, forest revenue collection is US\$1–5 per hectare. This group includes many of the countries with significant forest areas, such as Canada, Indonesia, the Russian Federation and the United States of America. Between them, these countries account for about 35 percent of revenue collection and 60 percent of the forest area. Starting with Brazil, the final group of 24 countries collects 65 percent of all the forest revenue reported. These countries (many in Europe) account for the remaining 20 percent of the forest area and have levels of revenue collection of over US\$5 per hectare.

TABLE 7.4
Sources and uses of public expenditure on forestry by region, 2005

Region	Public expenditure on forestry in 2005							
	Operational expenditure (million US\$)			Transfer payments (million US\$)			External funding (%)	Transfer payments (%)
	Domestic	External	Total	Domestic	External	Total		
Africa	418	122	541	31	53	84	28	13
Asia	1 699	12	1 712	4 999	43	5 041	1	75
Europe	2 266	151	2 417	1 468	263	1 731	10	42
North and Central America	5 505	30	5 535	751	17	769	1	12
Oceania	15	1	15	0	0	0	4	0
South America	98	5	103	60	2	63	5	38
World	10 001	321	10 323	7 309	378	7 687	4	43

Note: Totals are less than shown in Table 7.2 above because some countries did not provide a breakdown of their public expenditure.

FIGURE 7.8
Distribution of forest revenue collection at the global level, 2005

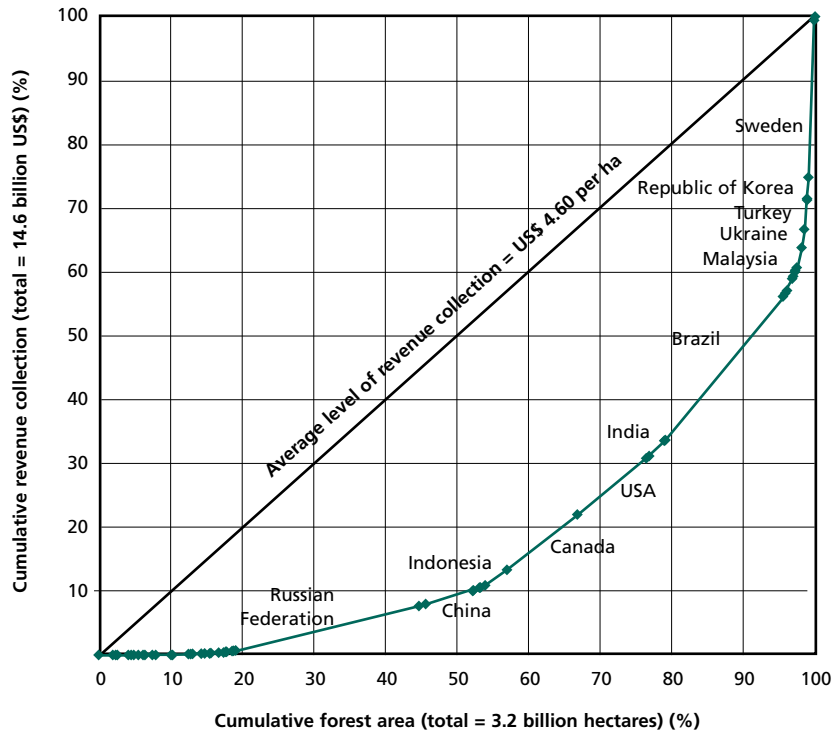
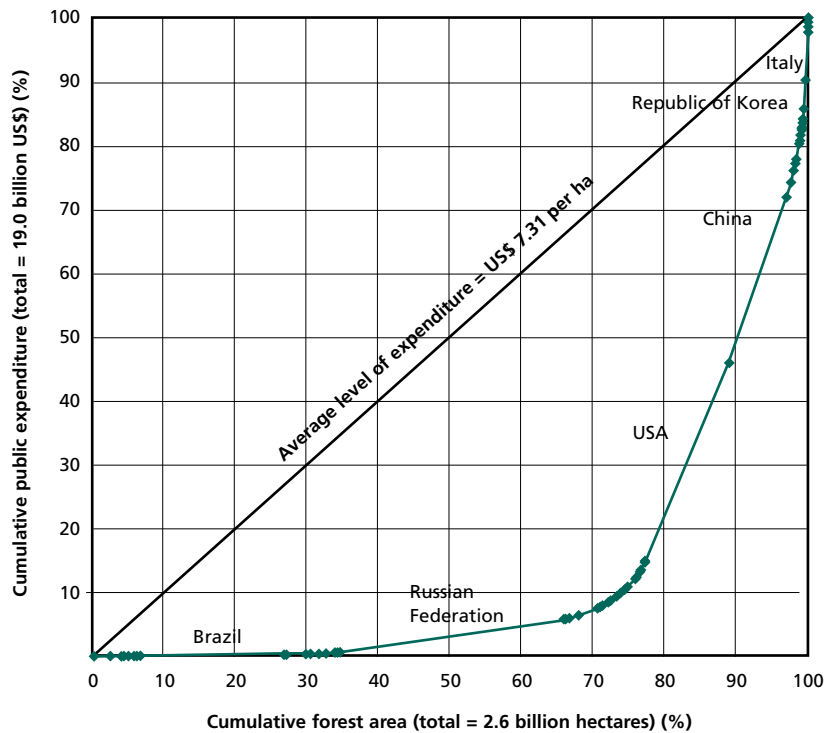


FIGURE 7.9
Distribution of public expenditure on forestry at the global level, 2005

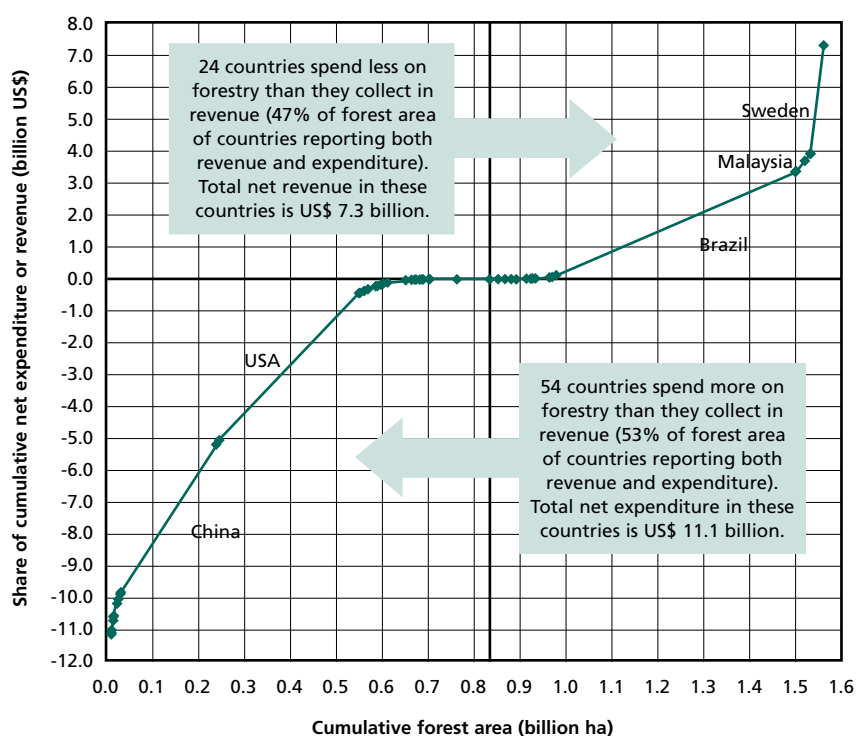


Thus, to summarize, very little revenue is collected from about 20 percent of the forest area while, at the other end of the scale, the majority of forest revenue is collected from another 20 percent of the area where revenue collection per hectare is very high. In the remaining 60 percent of the forest area between these two extremes, revenue collection per hectare is close to the global average.

The distribution of public expenditure on forestry (Figure 7.9) shows even greater variation between countries. Twenty-seven countries spent less than US\$1 per hectare on forestry, accounting for less than 1 percent of all public expenditure on forestry but 35 percent of the forest area. The most significant country in this group was Brazil, where public expenditure on forestry was just under US\$0.10 per hectare. A second group of 33 countries spent US\$1–10 per hectare on forestry. These countries accounted for a further 40 percent of the forest area and 12 percent of all expenditure. The Russian Federation had the most significant forest area in this group. The last group of 43 countries accounted for 25 percent of the forest area but about 88 percent of all public expenditure on forestry. Again, a few countries (China, Italy, the Republic of Korea and the United States of America) were significant in this group, accounting for a major share of public expenditure on forestry.

As the above figures have shown, there is great variation in revenue collection and public expenditure on forestry and this variation is even greater when the two datasets are combined (because some countries collect a lot of revenue and spend very little while others do the opposite). To show the net flows of funding between governments and the forestry sector, public expenditure was subtracted from revenue collection for those countries providing both of these figures and the results at the global level are shown in Figure 7.10.

FIGURE 7.10
Net revenue collection and public expenditure on forestry, 2005



A much smaller group of countries provided figures for both revenue and public expenditure (78 countries, covering 1.6 billion hectares or 40 percent of the global forest area) and the total net flow of funds in these countries was a net expenditure of US\$3.8 billion, indicating that governments, on average, spent more on forestry than they collected in revenue. Roughly two-thirds of these countries (or slightly more than half by forest area) spent more on forestry than they collected in revenue. However, as above, most of the net revenue or net expenditure occurred in a few significant countries and revenue and expenditure were roughly equal in the vast majority of countries. This can be seen in Figure 7.10, as the 48 countries between the United States of America and Brazil that are close to a zero share of cumulative net expenditure or revenue.

Trends

The changes in forest revenue and public expenditure on forestry (between 2000 and 2005) are shown in Table 7.5 and Table 7.6. Fewer countries provided this information for both years and these tables only compare the figures for countries reporting both years. However, they do give a general indication of trends in forest revenue and public expenditure in the different regions and at the global level.

Table 7.5 shows that forest revenue increased by about 44 percent between 2000 and 2005 (or about 7.6 percent per year on average). Industrial roundwood production increased only slightly between these two years (by about 8 percent), so the majority of this increase is due to higher levels of forest charges (per unit of production) and, possibly, higher collection of forest charges on other goods and services provided by forests. These figures are not adjusted for inflation, but indicate that forest revenue collection increased by more than the rate of inflation (i.e. increased in real terms).

At the regional level, all regions increased their revenue collection except Africa. The relatively low increase in North and Central America was largely due to Canada, where production did not increase much between the two years and revenue collection increased only slightly. The very large increase in Europe was largely a result of increases in Sweden and the Russian Federation. In both of these countries, industrial roundwood production increased, but the average level of revenue collection per cubic metre also increased (significantly in the case of the Russian Federation). In Africa, all of the decline in revenue collection was related to Gabon, where revenue collection fell from US\$143 million in 2000 to US\$16 million in 2005, despite an increase in production. Excluding Gabon, most other countries in this region increased their revenue collection by modest amounts.

TABLE 7.5
Trends in forest revenue collection by region, 2000–2005

Region	Countries reporting both years		Forest revenue			
	Number	% of forest area	2000 (million US\$)	2005 (million US\$)	Change rate (%)	
					total	per year
Africa	25	58	326	273	-16.3	-3.5
Asia	20	72	1 981	2 510	26.7	4.9
Europe	19	88	3 104	5 410	74.3	11.8
North and Central America	9	45	1 231	1 289	4.7	0.9
Oceania	7	20	103	146	42.1	7.3
South America	5	67	2 213	3 282	48.3	8.2
World	85	66	8 957	12 910	44.1	7.6

Note: The United States of America only provided data for 2000 and is therefore excluded from this table.

Table 7.6 shows that public expenditure on forestry also increased between 2000 and 2005 and by a similar amount to revenue collection (49 percent in total or 8.3 percent per year). At the regional level, there were modest increases in South America, and North and Central America and increases similar to the global average in Europe and Oceania. The two regions with significant increases were Africa and Asia. In the case of Asia, this was due to large increases in transfer payments in some countries (most likely due to increased government support for the establishment of planted forests). In Africa, the increase was mostly due to Morocco and South Africa, where there were large increases in public expenditure on forestry.

Both domestic and external funding increased between 2000 and 2005, but the share of external funding in total public expenditure was largely unchanged (3 percent in 2000 and 4 percent in 2005). Furthermore, this slight increase in external funding occurred mainly in Europe and was most likely a result of the expansion of the European Union (giving more countries access to the European Union's common funds). In addition, there was also a slight increase in external funding for forestry in Africa, while external funding declined in all of the other regions.

The most interesting change in the public expenditure data was the shift in expenditure towards transfer payments that occurred between 2000 and 2005. Transfer payments increased from US\$3.7 billion (31 percent of total expenditure) in 2000 to US\$7.7 billion (43 percent of the total) in 2005. Furthermore, the total amount of transfer payments increased in all regions (and increased as a proportion of the total in all regions except Europe).

Table 7.5 and Table 7.6 are not directly comparable because data from some countries appear in only one of the tables (e.g. South Africa and the United States of America). They imply that public expenditure has increased by more than revenue collection and that, at the global level, the difference between public expenditure and revenue collection has increased from 2000 to 2005 (i.e. net expenditure has increased). However, as noted above, these figures are very variable between countries, so they can only be usefully interpreted at the country level. Examination of the country data showed that net expenditure or net revenue in each country generally increased between the two years and that, apart from these increases in magnitude, the overall pattern of net expenditure or revenue was similar in 2000 to that shown in Figure 7.10.

Conclusions

Given the huge variations between countries, any conclusions reached from interpretation of these figures are likely to be very general and will not apply to many

TABLE 7.6
Trends in public expenditure on forestry by region, 2000–2005

Region	Countries reporting both years		Public expenditure on forestry			
	Number	% of forest area	2000 (million US\$)	2005 (million US\$)	Change rate (%)	
					total	per year
Africa	20	36	361	578	60.1	9.9
Asia	19	51	2 969	6 727	126.6	17.8
Europe	24	13	2 792	3 994	43.1	7.4
North and Central America	8	44	5 382	5 910	9.8	1.9
Oceania	4	16	10	14	40.9	7.1
South America	6	71	148	160	7.7	1.5
World	81	40	11 663	17 383	49.0	8.3

countries. However, the figures support four general observations about the status and trends in forest revenue collection and public expenditure in the sector.

The first observation is that, in the majority of countries, public expenditure on forestry is higher than revenue collected from the sector. However, with a few exceptions, this level of support is generally quite modest. Thus, the majority of investment in forest management comes from the private sector (including local communities and individuals as well as the forest industry) and is probably devoted to commercial or productive uses of the forest resource.

A second observation is that public expenditure on forestry is gradually moving away from operational expenditure towards transfer payments. To some extent, this may be due to changes in forest ownership and, especially, government support for planted forest establishment. However, it also suggests that the role of forest administrations is gradually changing away from direct action and regulation of the sector towards facilitation and support for other non-state actors. This is in line with a general trend in public administration in many countries in recent years, where governments are tending to take less of a direct role in service provision and focus more on facilitation and service provision through partnerships with the private sector.

Comparing the two years 2000 and 2005, both revenue collection and public expenditure have increased in real terms (i.e. by amounts higher than the level of inflation), so government interest and involvement in the sector has increased. This is a positive development but, as noted above, the increase in net public expenditure on forestry is only modest in most countries. The non-market benefits of forests are often stressed in forestry policy debates, but forest administrations seem unable to compete with other demands for public funding, to achieve higher levels of public investment in the sector. This suggests that either these benefits are not particularly important (e.g. when compared to other public services) or that forest administrations are not particularly effective at communicating the importance of forests and forestry to decision-makers in government.

Finally, the one region that appears very different from the others is Africa (both at the regional and country levels). Revenue collection and public expenditure are comparatively low in Africa and the region relies greatly on external assistance; the majority of public expenditure on forestry in the region is destined for operational expenditure. To some extent, these figures reflect some of the general constraints to development in Africa. However, they also imply that governments have relatively little interest or capacity to support the sector. Given that the majority of forest resources in this region are still nominally owned or controlled by the government (in many of these countries, all forest is publicly owned), this suggests that existing arrangements for forest administration in Africa may be quite ineffective.

VALUE OF WOOD AND NON-WOOD FOREST PRODUCT REMOVALS

Introduction

The value of wood and NWPF removals is an indicator of the contribution of forests and woodlands to national economies and is the indicator of socio-economic benefits that is generally most easy to quantify and interpret. These figures also provide some indication of how the sector contributes to poverty alleviation (especially in the case of NWPFs, which are often collected by poor people), although they mostly fail to include the very important contribution that subsistence production and consumption may make to local livelihoods. To compensate for annual fluctuations of volumes removed and their value, the figures for value of wood removals are five year averages i.e. the average of 1988–1992 for 1990, 1998–2002 for 2000 and 2003–2007 for 2005. As information on NWPFs is often limited, countries were only asked for the value of these for 2005.

Status

Information about the total value of wood removals in 2005 was provided by 112 countries covering 85 percent of the total forest area (see Table 7.7).²⁸ Countries were also asked to provide this information divided into industrial roundwood and woodfuel. Many countries responded for industrial roundwood, but far fewer provided information about the value of woodfuel removals.

With the exception of the Democratic Republic of the Congo, most of the countries that did not supply this information have relatively limited wood production. Considering this, and the fact that the value of woodfuel removals is generally low, the data collected for FRA 2010 gives a reasonable indication of the value of wood removals at the global and regional levels.

A total of 85 countries, accounting for 77 percent of the global forest area, provided information on the value of NWFP removals (using the same methodology as that described for the quantity assessment in Chapter 5). At the regional and subregional levels, the highest response rate (based on the forest area of countries reporting data) was achieved in North America, followed by East Asia, Europe, Southeast Asia, South America, Oceania, Africa and Western and Central Asia.

In general, more information was reported about the value of plant products than animal products (except in OECD countries). Within the plant product categories, most information was available for food, exudates, ornamental plants, and medicinal and aromatic plants. For animal products, most information was available for honey and beeswax.

It should be noted that there are a number of problems with assessing the value of NWFP removals. One is that the assessment asked for the value of primary production (i.e. excluding the income from downstream processing outside the forest), but in many cases countries reported figures for the values of semi-processed products (which are often significantly higher to cover transport and labour costs). For example, some countries provided value data on their production of shea nut butter, which is obtained by processing the seeds of the *Butyrospermum parkii* tree, rather than assessing the value of the seeds. Another example is the case of wild honey, which is collected in forests and refined and graded (at various levels) before being brought to the market. Many countries provided value data based on this final market value.

Another problem is many countries only reported the value of their five to ten most important NWFPs and did not provide estimates of the total value of all NWFPs

TABLE 7.7
Number of countries reporting value of wood removals by region, 2005

Region	Woodfuel		Industrial roundwood		Total	
	Number of countries reporting	% of forest area	Number of countries reporting	% of forest area	Number of countries reporting	% of forest area
Africa	23	32	25	46	33	50
Asia	13	24	22	74	24	73
Europe	26	96	29	96	29	96
North and Central America	3	53	8	98	8	98
Oceania	2	1	6	98	6	98
South America	5	67	12	93	12	93
World	72	57	102	84	112	85

²⁸ Some countries only provided information for the value of woodfuel or industrial roundwood removals (e.g. Canada, China and Malaysia only provided the latter) and did not present a total on the FRA questionnaire. In such cases, these figures were used for the totals in the analysis and were included in the tables presented here.

produced in the country. Most countries also only reported the value of NWFPs that are used commercially and did not estimate the value of those mainly used for subsistence.

Given these measurement problems, the figures for the value of NWFP removals are very imprecise and could be significant over- or underestimates, depending on the types of products removed, their uses and the different methodologies employed to estimate their values. However, they give a very broad indication of the importance of different products, regional variations and the relative importance of NWFPs compared to removals of wood products.

Table 7.8 shows that the total value of forest product removals in 2005 was US\$121.9 billion; about 71 percent of this was from industrial roundwood, 15 percent from NWFPs and 14 percent from woodfuel.

At the regional level, most of the value of removals occurred in three regions: Asia, Europe and North and Central America. These three regions together accounted for 87 percent of the total value of removals. The other interesting result at the regional level was the very different composition of the value of removals in different regions. In North and Central America, Oceania and South America industrial roundwood accounted for almost all of the value of removals. The value of woodfuel removals was particularly important in Asia and Africa (although this may be under-reported in many of the other regions).

Table 7.8 also shows the value of wood removals per cubic metre. As would be expected, the average value of woodfuel was much lower (US\$18 per cubic metre) than the value of industrial roundwood (US\$51 per cubic metre). At the regional level, the differences in unit values were significant and can be explained by a number of factors. First, the relative abundance and scarcity of wood in different regions (i.e. supply and demand balance) may partly explain why the value of woodfuel and industrial roundwood removals in Asia was relatively high while the value of industrial roundwood removals in South America was relatively low. Second, species composition may account for some of the variation (e.g. removals of high value tropical species probably contribute to the higher unit values of removals in Africa and Asia). Similarly, regions with a relatively high proportion of removals from planted forests (e.g. Europe and South America) might be expected to have relatively low unit values, because the value of roundwood from planted forest is generally low compared to production from natural forests.

The variation in the average value (or price) of industrial roundwood removals is also interesting and is shown in Figure 7.11. This shows that the majority of industrial roundwood had a value of US\$30–70 per cubic metre and the value of roundwood in

TABLE 7.8
Total value of wood and NWFP removals by region, 2005

Region	Wood						NWFPs	All products
	Woodfuel		Industrial roundwood		Total		Total (billion US\$)	Total (billion US\$)
	billion US\$	US\$/m ³	billion US\$	US\$/m ³	billion US\$	US\$/m ³		
Africa	1.4	7	2.9	54	4.3	16	0.5	4.8
Asia	10.3	27	18.1	100	28.4	51	7.0	35.4
Europe	3.4	23	20.7	40	24.1	36	8.4	32.5
North and Central America	0.4	7	37.0	53	37.3	49	1.7	39.0
Oceania	0	14	2.7	51	2.7	51	0.4	3.1
South America	1.8	12	4.7	25	6.4	19	0.5	6.9
World	17.2	18	86.1	51	103.4	39	18.5	121.9

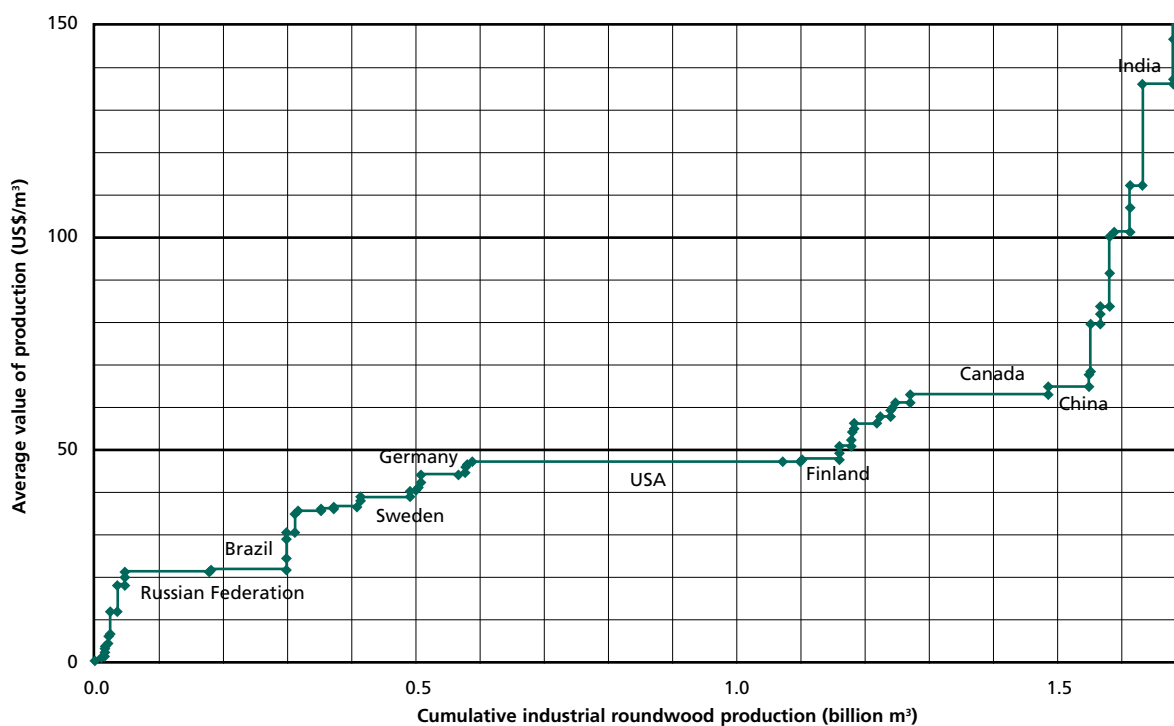
many of the world's major wood producing countries fell into this range. Significant producers with relatively low industrial roundwood values included Brazil and Russia, whereas the value of roundwood in India (where wood is scarce compared to the size of the population) was very high. The average value of industrial roundwood varied between countries (and was also variable within countries) for a number of reasons. Nonetheless, Figure 7.11 provides a very general indication of average industrial roundwood prices in different countries.

Table 7.9 shows the relative importance of the different NWFPs (in terms of the value of removals) at the global and regional level.²⁹ At the global level, five major categories accounted for 90 percent of the total value of NWFP removals: food (51 percent), other plant products (17 percent), honey (11 percent), ornamental plants (6 percent) and exudates (4 percent).

Plant products (eight categories) accounted for 84 percent of the total value of NWFP removals and food had the highest value (US\$8.6 billion). Fruit, berries, mushrooms and nuts were identified as the main food products by most countries. Other plant products (US\$2.8 billion) included a wide range of species used mainly for non-food purposes (e.g. the production of bidi leaves in India).

The removal of animal products had a total value of US\$2.7 billion, with US\$1.8 billion from honey and beeswax, and US\$0.6 billion from wild meat production. However, these figures may not include a significant amount of animal products. For example, the reported value of wild meat (bushmeat) removals outside Europe was

FIGURE 7.11
Value of industrial roundwood removals, 2005



²⁹ The total value for the 15 NWFP categories is lower than the total global reported value of US\$18.5 billion, because the values of 'any other plant or animal products' (over and above the top ten products) are not shown here.

TABLE 7.9
Value of NWFP removals by category and region, 2005

NWFP categories	Total (million US\$)	Share of each category in total value (%)					
		World	Europe	Asia	Americas	Oceania	Africa
Food	8 614	51	48	67	23	47	39
Other plants products	2 792	17	3	22	61	3	7
Wild honey and beeswax	1 805	11	21	n.s.	n.s.	12	n.s.
Ornamental plants	984	6	10	1	3	4	0
Exudates	631	4	1	7	5	0	25
Plant materials for medicine, etc.	628	4	5	2	1	9	18
Wild meat	577	3	7	n.s.	n.s.	1	2
Materials for utensils, construction, etc.	427	3	3	1	3	18	n.s.
Hides, skins and trophies	183	1	1	n.s.	3	7	n.s.
Living animals	154	1	2	n.s.	n.s.	0	7
Fodder	21	n.s.	n.s.	n.s.	n.s.	0	2
Colorants and dyes	18	n.s.	n.s.	n.s.	n.s.	0	n.s.
Other non-edible animal products	6	n.s.	0	n.s.	0	0	n.s.
Other edible animal products	1	n.s.	n.s.	0	0	0	n.s.
Raw animal material for medicine	0	n.s.	n.s.	0	0	0	0
Total value (million US\$)	16 839	16 839	8 389	5 655	2 132	402	261

Note: n.s. = 'not significant' (i.e. less than one percent of the total)

only US\$10 million, which is likely to be a vast underestimate of the true value of removals in other regions.

In Europe, major producers of NWFPs included the Russian Federation (61 percent of the European total), Germany (7 percent), Spain (6 percent), Portugal (5 percent), and Italy (4 percent). Together, these countries accounted for 83 percent of the European total. Three NWFP categories in Europe accounted for 79 percent of the total value of removals: food (48 percent), honey (21 percent) and ornamental plants (10 percent). The reported value of wild meat removals was close to US\$0.6 billion and the value of all hunting products combined amounted to about 10 percent of the total.

In Asia, three countries accounted for 96 percent of the value of all NWFP removals: China (67 percent), Republic of Korea (26 percent) and Japan (3 percent). Food was by far the most significant product (67 percent of the Asian total), followed by other plant products (22 percent) and exudates (7 percent).

In the Americas (North, Central and South America, plus the Caribbean), the United States of America accounted for 61 percent of the value of NWFP removals, followed by Brazil (13 percent), Canada (12 percent) and Colombia (7 percent). Together, these four countries accounted for 93 percent of the reported total. Major NWFP categories were other plant products (61 percent of the total), food (23 percent) and exudates (5 percent).

South Africa accounted for 71 percent of the total value of NWFP removals in Africa, followed by Sudan (10 percent). Food and exudates (mainly gum arabic) were the most important NWFPs, accounting for 39 percent (food) and 25 percent (exudates) of the total value of production.

In Oceania, food accounted for nearly half (47 percent) of the value reported, followed by materials for utensils and construction (18 percent) and wild honey and beeswax (12 percent).

At the country level, China and Russia accounted for half of the global value of NWFP removals and 23 countries accounted for 96 percent of the global total. Countries with high values of NWFP removals are shown in Figure 7.12.

Trends

Due to a number of factors, comparisons of the value of wood and NWFP removals in different years may be very unreliable. First, trends in the value of wood removals can only be analysed for countries supplying information for all the years requested in the FRA 2010 enquiry, but the number of countries reporting this information was very low (see Table 7.10). Second, in the case of NWFPs, the amount and reliability of data probably improved significantly in FRA 2010 compared with the previous assessment (see below), so any difference between the values reported for FRA 2005 and FRA 2010 is likely to reflect improvements in data collection and reporting rather than real trends in values.

Finally, the values of removals may fluctuate greatly from year to year (depending on market conditions), so information for only a few years may reflect short-term

FIGURE 7.12
Countries with high values of NWFP removals, 2005

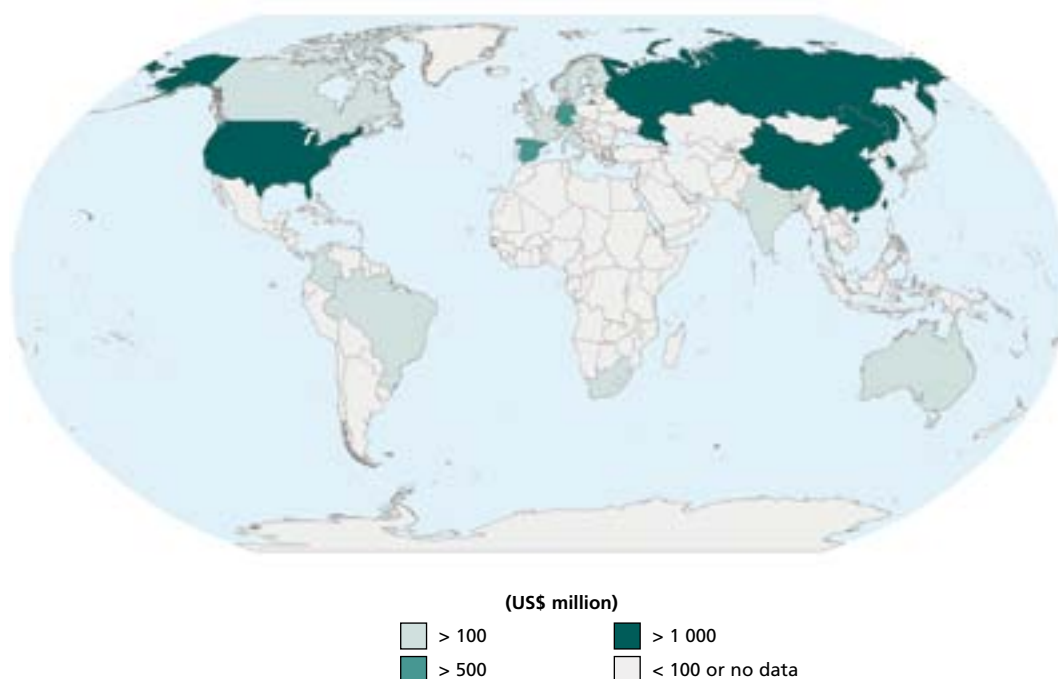


TABLE 7.10
Countries reporting on value of wood removals by region, 1990, 2000 and 2005

Region	Woodfuel		Industrial roundwood		Total removals	
	Number of countries reporting	% of forest area	Number of countries reporting	% of forest area	Number of countries reporting	% of forest area
Africa	14	23	19	35	22	36
Asia	11	24	18	72	21	73
Europe	20	15	23	15	23	15
North and Central America	3	53	5	97	5	97
Oceania	1	0	3	20	4	20
South America	4	67	7	70	7	70
World	53	35	75	53	82	53

changes in market values rather than long-term trends. This is particularly true for industrial roundwood, where a more complete time series (i.e. annual figures over many years) would be required to get a better picture of trends in values.

Table 7.11 compares the values of wood removals in 1990, 2000 and 2005. The countries supplying this information only accounted for about half of the global forest area and the table does not show the value of woodfuel removals separately (although this is included in the calculated totals). The table shows that the total value of wood removals in 1990 and 2000 were roughly the same but increased by 31 percent between 2000 and 2005 (with the same trends for industrial roundwood removals, which account for the majority of the total).

At the regional level, two different trends are present in the data. Africa, Asia, Europe and South America showed a decline in the value of roundwood removals from 1990 to 2000, followed by an increase from 2000 to 2005. Similar trends also appear in the values of removals per cubic metre in these regions. In North and Central America and Oceania, the figures show an increase in the value of removals throughout the period.³⁰

These comparisons between years can be partly explained by short-term market conditions. The decline in the value of removals in Asia (1990–2000) is partly due to the economic crisis that affected much of this region at the end of the 1990s. This resulted in a decline in both removal volumes and unit values. In Europe, the relatively low figure for 2000 reflects the longer and more gradual process of market liberalization in Eastern Europe that occurred throughout the 1990s. This started with dramatic falls in removal volumes and unit values at the start of the 1990s, followed by a gradual increase in volumes and values as markets across Europe began to converge. In both cases, the value of removals per cubic metre was still lower in 2005 than in 1990, although close to previous levels.

In North and Central America and Oceania these economic events did not have as great an impact on the markets for roundwood because most wood removals are used within the country or region or are traded with other countries that were less affected by such events (e.g. Japan). However, international trade in wood and wood products is much more important in South America and Africa and this could partly explain why the trends in these regions are similar to those in Europe and Asia.

In the case of NWFPs, trends cannot be calculated because countries were only asked to provide data for one point in time (2005). The reported global value of NWFP removals in FRA 2005 was US\$4.7 billion, compared with the figure of US\$18.5 billion in FRA 2010. However, a much larger number of countries (85) reported the value of

TABLE 7.11
Trends in value of wood removals by region, 1990–2005

Region	Industrial roundwood removals						Total roundwood removals		
	Total value (billion US\$)			Unit value (US\$/m ³)			Total value (billion US\$)		
	1990	2000	2005	1990	2000	2005	1990	2000	2005
Africa	1.7	1.1	1.7	50	28	38	2.6	2.1	2.9
Asia	21.7	15.1	18.1	106	92	100	31.0	22.9	28.4
Europe	14.5	11.6	17.2	49	34	46	17.0	13.4	20.3
North and Central America	18.1	28.6	36.7	26	40	52	18.4	29.0	37.1
Oceania	0.6	0.9	1.5	40	39	55	0.6	0.9	1.5
South America	4.2	3.1	4.4	28	21	24	5.5	4.4	6.1
World	60.8	60.4	79.7	43	42	53	75.2	72.8	96.3

³⁰ However, it should also be noted that the value of wood removals has declined again in many regions since 2005, as a result of the economic recession at the end of this decade.

NWFP removals in the more recent enquiry and the quality of reported data appeared to be much higher. Therefore, this significant increase is mainly due to changes in the amount and quality of data collected this time rather than a real increase in values.

Conclusions

The figures presented above show that industrial roundwood remains by far the most important output from forests (in terms of market value) at the global level and in every region. However, they also show that this value can vary considerably over time, due to changes in market conditions.

Interestingly, the total value and unit value of wood removals has only increased in real terms in North and Central America and in Oceania. In all other regions, these values have increased by less than the rate of inflation or, in some cases, have even declined. Although these trends only cover about half of the global forest area, this suggests that significant changes are occurring in the supply of roundwood. At least part of these changes may be due to the growing importance of planted forests in global wood supply. One implication of these trends is that, if the value of removals continues to stagnate or fall, income from wood production will also fall and forest owners and managers will find it more difficult to invest in forest management in natural forests. This has wider implications for the question of how sustainable forest management should be financed and implemented.

It is important to recognize and applaud the significant efforts that countries have made to improve the quality of their NWFP reporting for FRA 2010. The 85 countries that provided NWFP value data have a total forest area of 3.1 billion hectares (77 percent of the total forest area), which is a great improvement on past enquiries.

Although the availability of information may still be quite limited, the significant value of NWFP removals clearly underlines the importance of this sector for national economies, rural development and poverty alleviation. Given that NWFP removals benefit large numbers of people, there is an urgent need to improve these statistics to explain more precisely the contribution of NWFPs to sustainable forest management, nature conservation, poverty alleviation and economic development. This is especially true for the many developing countries working towards achieving the Millennium Development Goals.

EMPLOYMENT

Introduction

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, employment is valuable because it enables individuals to be 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. Governments are concerned about the level of employment and this is often a major performance indicator for government policy.

For FRA 2010, employment was defined as:

*“Persons who during a specified reference period performed some work for wage or salary (paid employment) or profit or family gain (self-employment) in cash or in kind”.*³¹

³¹ This definition was based on definitions used by the International Labour Organization and the United Nations Statistics Division.

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 NWFPs). Thus the figures cannot be compared with statistics on employment in the forestry sector as a whole. In contrast to FRA 2005, the definition of “Employment in primary production of goods” used this time was aligned with the International Standard Industrial Classification (ISIC) of economic activities, generally used by national statistical agencies in most countries.³²

Status

At the global level, 141 countries³³ reported on forestry employment in the primary production of goods and 76 countries reported on employment in the management of protected areas. Those reporting for all three years account for about 60 percent of global forest area.

As a check on the quality of the information, the data provided for FRA 2010 were compared with the statistics on forestry employment reported by national statistical offices (FAO, 2008c). This detailed examination of the quality of the statistics revealed a number of problems and issues, especially with a few large countries, which had a major impact on the global results (see Box 7.2).

The total reported level of employment in forestry in 2005 was about 11 million people (see Table 7.12). Regionally, the reported level of employment is highest in Asia (8.4 million), with India accounting for three-quarters of this and China a further 15 percent (1.3 million). Reported employment in the management of protected areas accounted for only about three percent of total employment in forestry.

BOX 7.2

Problems and issues with the estimation of employment levels in forestry

It appears that some countries may have reported the number of people employed part time in the sector, without converting these figures to full time equivalents. India provided the most notable example of this, where the national report showed very high levels of employment in the sector (6.4 million people in 1990 and 6.2 million in 2005). This was largely a result of 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 planted multiplied by the average number of people employed per hectare. For forest plantation establishment, this factor was reported to be 3 persons per hectare. While 3 persons per hectare, on average, may have been employed temporarily at some time in planting trees, it seems very unlikely that this is a figure for permanent employment in tree planting.

Moreover, most countries (including India) stated that their data did not include the number of people collecting woodfuel and NWFPs for subsistence purposes. Although the guidelines and definitions (FAO, 2007h) noted that all employment should be included in the statistics, it seems likely that employment in subsistence production was not captured here for most countries. In addition, where countries did provide subsistence employment figures, the data and methodologies used to estimate these figures seemed quite weak and differed between countries.

³² The FRA 2010 definition of forestry employment also included employment in Christmas tree, rubber and bamboo plantations. This differs from the ISIC definition, which counts these activities as agriculture rather than forestry.

³³ Ten of these countries only provided information on paid employment.

In 2008, FAO estimated that total employment in forestry in 2005 was 4 million (FAO, 2008b). Although that figure included estimates for a number of countries, it is notable that the statistics reported above amount to more than twice this figure. However, one country – India – accounts for much of this discrepancy.³⁴ In many other countries, the figures reported here and in FAO (2008c) are quite similar or can be explained by differences in definitions.

Trends

Table 7.13 shows global and regional trends in employment, based on the data from countries that reported on employment for all three years (1990, 2000 and 2005). Globally, reported employment in forestry declined slightly from 1990 to 2005 by about 1 million (or 10 percent) and most of this decline occurred during the 1990s. Asia

TABLE 7.12
Number of people employed in forestry by region, 2005

Region	Data availability				Number employed (thousand FTE)		
	Primary production of goods		Management of protected areas		Primary production of goods	Management of protected areas	Total
	Number of countries	% of forest area	Number of countries	% of forest area			
Africa	34	52	20	25	573	13	586
Asia	31	83	19	73	8 232	179	8 411
Europe	35	99	20	91	1 113	126	1 239
North and Central America	16	89	8	43	354	16	370
Oceania	6	98	3	4	27	2	28
South America	10	84	6	75	239	3	242
World	132	84	76	61	10 537	338	10 876

TABLE 7.13
Trends in number of people employed in forestry by region, 1990–2005

Region	Data availability				Number employed (thousand FTE)								
	Primary production of goods		Management of protected areas		Primary production of goods			Management of protected areas			Total		
	Number of countries	% of forest area	Number of countries	% of forest area	1990	2000	2005	1990	2000	2005	1990	2000	2005
Africa	26	44	12	20	333	391	427	9	10	10	342	401	437
Asia	31	87	12	53	8 911	8 196	8 150	43	102	160	8 954	8 298	8 310
Europe	31	95	9	5	1 672	1 076	1 005	5	10	11	1 677	1 086	1 016
North and Central America	11	89	4	0	223	252	234	–	–	–	223	252	234
Oceania	5	98	3	4	25	28	26	1	1	2	27	30	28
South America	5	7	3	6	46	53	59	1	1	1	47	54	60
World	109	65	43	14	11 210	9 996	9 901	60	125	184	11 270	10 121	10 085

³⁴ The figure presented in FAO (2008c) was 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 people (compared with over 6 million reported to FRA 2010).

and Europe accounted for all of this decline, while in the other regions employment increased slightly.

These changes in employment can be explained by a number of factors. In general, this 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). The fall in employment in Asia was influenced by a steep decline in China because of the partial logging ban in the late 1990s. In Europe, the decline in employment numbers can be explained by the restructuring of formerly centrally-planned economies. In some countries this has led to decreased production and lower 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. In the regions showing an increase in employment, this is partly because roundwood production has increased faster than labour productivity (for a more detailed discussion, see FAO, 2008c).

Conclusions

Given the unreliability of 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 data collected at the global and regional levels. However, the figures suggest that employment is probably declining somewhat in most countries and regions.

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.

AREA OF FOREST DESIGNATED FOR SOCIAL SERVICES

Introduction

The area of forest designated for social services indicates the extent to which countries and forest managers have identified specific forests areas for recreation, tourism, education, research and for the conservation of cultural or spiritual sites.

Out of the total of 233 countries and areas covered by FRA 2010, 205 provided data on the designated functions of their forests, together accounting for 99.9 percent of the total forest area. Many countries reported that they did not have forest areas specifically designated for this purpose, while data were incomplete in others. Just 59 countries designated more than 1 000 ha of forests under this category and only 53 of these provided a complete data series (1990, 2000, 2005 and 2010).

Many countries recognize the importance of this function but have included it under the category of multiple use and/or unknown function when it was not possible to quantify the area. The United States of America, for instance, did not report any forest area designated primarily for social services, but included such areas within the multiple use category while noting that 85 percent of the national forest area was available for outdoor activities. Many forests in Africa and elsewhere are used for tourism, but the main function, in most cases, is the conservation of wildlife. National parks were therefore mostly assigned to the category conservation of biological diversity rather than social services. Even among the countries that did report areas designated for social services, there continued to be different interpretations of which areas should be included in this category³⁵ and figures are, therefore, not always comparable between countries.

³⁵ Brazil and Guyana reported on forests designated for the protection of the culture of indigenous and forest-dependent peoples, seven countries focused on recreation and highlighted the importance of urban forests, three countries focused on sacred forests, two on education and one made specific reference to human well-being. The remaining countries referred to tourism or a combination of the purposes mentioned above.

Status

Globally, an estimated 3.7 percent of the world's forests were designated for the provision of recreation, tourism, education or conservation of cultural and spiritual heritage. However, the only subregions and regions with fairly good data were East Asia and Europe. The provision of such social services was reported as the primary management objective for 3 percent of the total forest area in East Asia and 2 percent in Europe (see Table 7.14).

The top five countries with forest areas designated for social services were Brazil, the Russian Federation, China, Japan and Ukraine, which together designated some 142 million hectares for this purpose. Brazil has designated 119 million hectares, or more than one-fifth of its forest area, for the protection of the culture and way of life of forest-dependent peoples. This area accounts for more than three-quarters of the total area of forest designated for social services worldwide.

At the regional level, South America contributed 78 percent (mainly in Brazil) of the total area in this category; Europe 14 percent; and Asia 7 percent. The remaining regions together accounted for around 1 percent of the total area designated for the provision of social services.

Trends

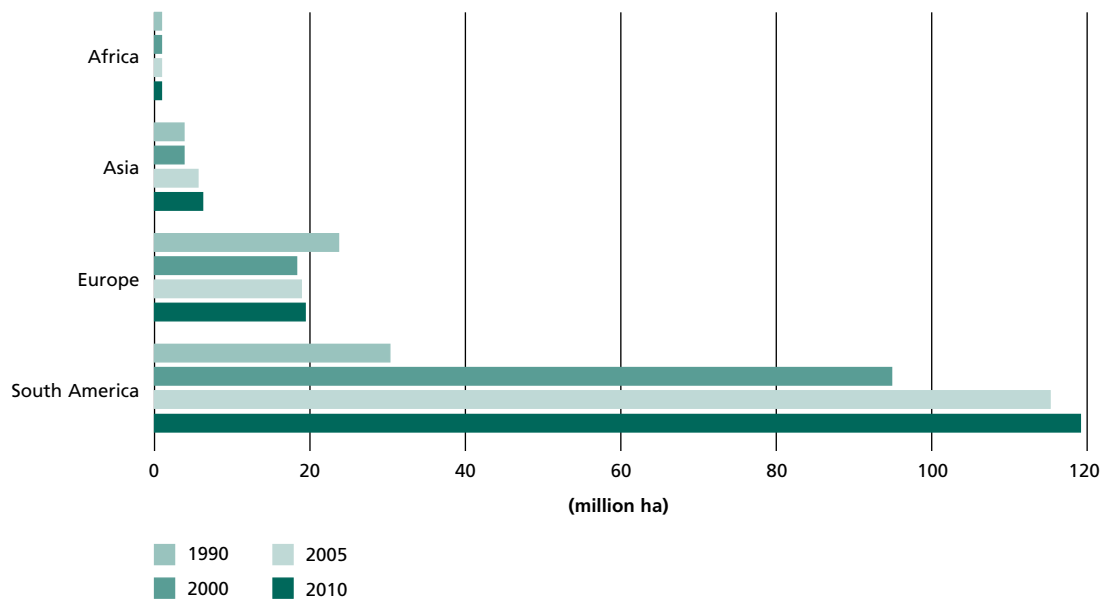
The analysis of trends of forest area designated for social services is based on those countries and areas that reported a complete time series.

The strong trend towards increasing area in South America (see Figure 7.13) is entirely accounted for by Brazil, where large areas of forest were designated as 'indigenous lands' and 'sustainable development reserves' during the 1990s. Europe shows a decrease in forest area designated for social services between 1990 and 2000 and an increase from 2000 to 2010, while Asia (mainly East Asia) reported a slight increase in the last decade. The trend in Africa was stable.

TABLE 7.14
Area of forest designated for social services by region and subregion, 2010

Region/subregion	Information availability		Area designated for social services	
	Number of countries	% of total forest area	1 000 ha	% of forest area
Eastern and Southern Africa	23	100.0	464	0.2
Northern Africa	7	99.1	3	n.s.
Western and Central Africa	24	100.0	434	0.1
Total Africa	54	99.9	901	0.1
East Asia	5	100.0	8 347	3.3
South and Southeast Asia	17	100.0	283	0.1
Western and Central Asia	24	100.0	823	1.9
Total Asia	46	100.0	9 453	1.6
Europe excl. Russian Federation	45	100.0	6 432	3.3
Total Europe	46	100.0	19 377	1.9
Caribbean	12	53.8	19	0.5
Central America	7	100.0	767	3.9
North America	5	100.0	0	0
Total North and Central America	24	99.5	786	0.1
Total Oceania	21	99.8	67	n.s.
Total South America	14	100.0	119 561	13.8
World	205	99.9	150 146	3.7

FIGURE 7.13
Trend in forest area designated for social services by region, 1990–2010



Note: North and Central America is not included because countries in this subregion reported no areas designated for this function. Oceania is excluded due to low information availability of trend data.

Conclusions

A higher percentage of the world's countries reported on the designated functions of forests for FRA 2010 (81 percent) in comparison with the FRA 2005 (75 percent). However, there continue to be substantial data gaps in terms of the area of forest designated for social services and a wide range of interpretations of which areas should be included in this category, which make comparison between countries and regions difficult.

The main conclusion therefore remains that the management of forests for social and cultural functions is increasing, but the area is difficult to quantify. Future assessments should focus on obtaining more detailed and more comparable data on this variable.