FIGURE 24 Subregional breakdown used in this report

Europe excluding Russian Federation: Albania, Andorra, Austria, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Faeroe Islands, Finland, France, Germany, Gibraltar, Greece, Holy See, Hungary, Iceland, Ireland, Isle of Man, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Netherlands, Norway, Poland, Portugal, Romania, San Marino, Serbia and Montenegro, Slovakia, Slovenia, Spain, Sweden, Switzerland, The former Yugoslav Republic of Macedonia, Ukraine, United Kingdom

Europe

EXTENT OF FOREST RESOURCES

Forest statistics in Europe are dominated by the Russian Federation (including the part in Asia), which accounts for 81 percent of the total forest area. For the purposes of this study, therefore, it was decided to simply divide Europe into two categories: the Russian Federation and all other European countries.

The reported forest area for Europe in 2005 (excluding the Russian Federation) was 193 million hectares, an increase of almost 7 percent since 1990 (Figure 25 and Table 13). This compares with a net global decrease of 3 percent in forest area over the same period of time. Europe is the only major region with a net increase in forest area over the entire period of 1990–2005. (Asia has reported a net increase in the last five years, mainly a result of the massive afforestation programme in China.)

The reported net forest area in the Russian Federation is virtually stable, with a small increase in the 1990s and a small decline from 2000 to 2005.

The net increase in forest area in Europe is a result, in large part, of substantial increases in several countries over 2000–2005, led by Spain (296 000 ha/year average increase) and Italy (106 000 ha/year), followed by Bulgaria, France, Portugal and Greece. The largest percentage increases were reported by countries with low forest cover: Iceland (3.9 percent increase in forests per year) and Ireland (1.9 percent) (Figure 26).

The Russian Federation was the only European country reporting a net loss of forest area over 2000–2005, an average decrease of 96 000 ha/year; however, this amounted to only a 0.01 percent loss of total forest area.

FIGURE 25 Extent of forest resources

SOURCE: FAO, 2001a.

TABLE 13
Extent and change of forest area

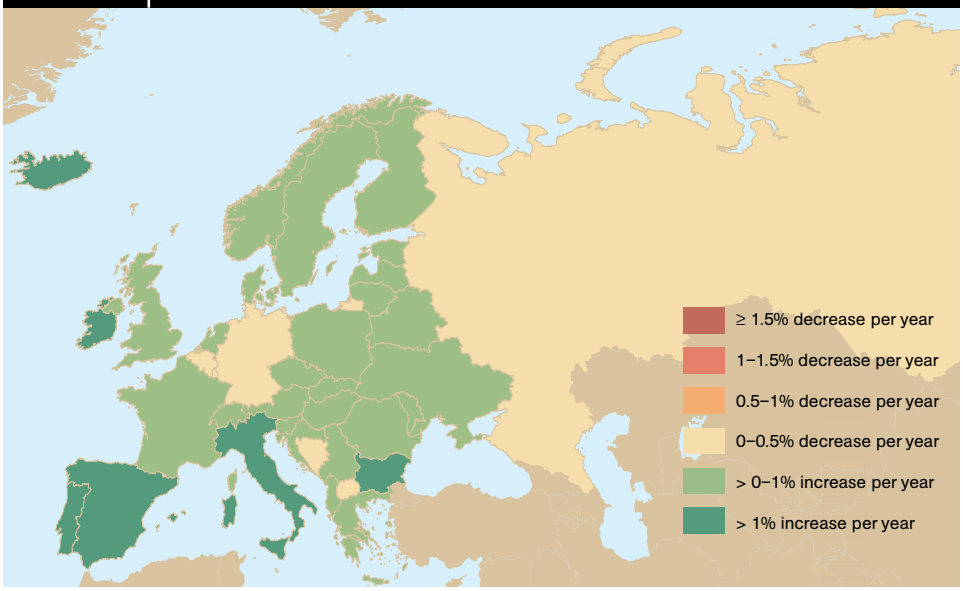
	Area (1 000 ha)			Annual change (1 000 ha)		Annual change rate (%)	
	1990	2000	2005	1990–2000	2000–2005	1990–2000	2000–2005
Europe excluding Russian Federation	180 370	188 823	192 604	845	756	0.46	0.40
Russian Federation	808 950	809 268	808 790	32	–96	0	–0.01
Total Europe	**989 320**	**998 091**	**1 001 394**	**877**	**661**	**0.09**	**0.07**
World	**4 077 291**	**3 988 610**	**3 952 025**	**–8 868**	**–7 317**	**–0.22**	**–0.18**

TABLE 14

Area of forest plantations

	Area (1 000 ha)			Annual change (1 000 ha)	
	1990	2000	2005	1990–2000	2000–2005
Europe excluding Russian Federation	8 561	10 032	10 532	147	100
Russian Federation	12 651	15 360	16 963	271	320
Total Europe	**21 212**	**25 393**	**27 495**	**418**	**420**
World	**101 234**	**125 525**	**139 466**	**2 424**	**2 788**

FIGURE 26 Forest change rates by country, 2000–2005



Slightly less than half of Europe's net increase in forest area over the past 15 years results from an increase in forest plantations (Table 14). The rest results from natural expansion of forests into former agricultural land and the establishment of "semi-natural" planted forests using native species, not considered to be forest plantations in Europe.

Net increases in the extent of forest, in forest plantations and in growing stock are positive trends towards sustainable forest management in the region. The Russian Federation is the only reporting country with a negative trend in this regard, but its net decrease of forest area was only 0.02 percent over the entire period of 1990–2005. All indications are that European countries have successfully stabilized or increased their forest areas, in many cases from the nineteenth or early twentieth centuries.

BIOLOGICAL DIVERSITY

The conservation of biological diversity provides a different challenge in Europe than in other regions. While few species are currently threatened or endangered, this is mainly because much of Europe's forest has been drastically changed by human activity over several millennia. Although most of Europe has been deforested in the past under a variety of human influences such as agriculture, industrialization and war, many areas have also been reforested, naturally or intentionally, over the centuries.

Only 4 percent of Europe's forest area (excluding the Russian Federation) is classified as primary forest, compared with 27 percent of the world as a whole. The data indicate a slightly increasing trend in primary forests in Europe, other than in the Russian Federation, which accounts for 97 percent of Europe's total. Russia's primary forests increased in the 1990s, but declined by 0.2 percent per year from 2000 to 2005.

Another important proxy for conservation of biological diversity is the extent to which forest ecosystems are designated primarily for conservation. A positive global trend in the 1990s continued during 2000–2005, with the total increase over 15 years approaching 100 million hectares, an increase of 32 percent (Table 15). In Europe, the forest area designated primarily for conservation increased by 100 percent over this same period. Most of this increase occurred in the 1990s, but during 2000–2005 the increase was still significant, about 3 percent per year.

TABLE 15
Area of forest designated primarily for conservation

	Area (1 000 ha)			Annual change (1 000 ha)	
	1990	2000	2005	1990–2000	2000–2005
Europe excluding Russian Federation	6 588	17 687	20 272	1 110	517
Russian Federation	11 815	16 190	16 488	438	60
Total Europe	**18 402**	**33 877**	**36 760**	**1 548**	**576**
World	**298 424**	**361 092**	**394 283**	**6 267**	**6 638**

Some 10.5 percent of the forest area in Europe (excluding the Russian Federation) is designated for conservation, compared with a global average of 10 percent. In the Russian Federation, forest conservation area increased to 2 percent of total forest area.

The average number of threatened tree species per country in Europe is significantly less than in other regions, which would be expected, given the generally smaller number of species in these temperate and boreal ecosystems, as well as the relative stability of total forest area.

FOREST HEALTH AND VITALITY

Fire damage to forests in the Europe region (excluding the Russian Federation) constitutes less than 10 percent of the area reported for insect pests, diseases and other disturbances. Compared with other regions of the world, non-fire disturbances are relatively well reported in Europe, with information received on over 90 percent of the forest area. However, it is difficult to compare data, since there are different interpretations of what constitutes a disturbance. Forest pests and other disturbances may have even more widespread impact than reported.

For Europe as a whole, about 2 percent of total forest area was reported affected by disturbances in a typical year (considering the annual average over 1998–2002). For Europe excluding the Russian Federation, this figure increases to about 6 percent (Table 16). Figure 27 indicates the relative disturbances caused by the four reporting categories: fire, insects, diseases and all other types (storms, drought, ice, etc.) for Europe as a whole. By far the largest disturbance in Europe was storms, which were particularly severe in 1999.

International trade has increased the risk of introduction of damaging pests and diseases. For example, *Anoplophora chinensis*, which originates in Japan and the Korean peninsula, where it is a serious pest of *Citrus* spp. and many other deciduous trees, was discovered in Europe in 2000 in Lombardy, Italy. The potential impact on the region has not yet been determined.

Within Europe, the Ministerial Conference on the Protection of Forests in Europe (MCPFE) chose defoliation as a key indicator of forest health. The International Cooperative Programme on Forests (under the United Nations Economic Commission for Europe [UNECE] Convention on Long Range Transboundary Air Pollution) has systematically monitored the crown condition of forests since the mid-1980s, when the health of Europe's forests became a matter of particular concern.

FIGURE 27 Forest disturbances, 1998–2002

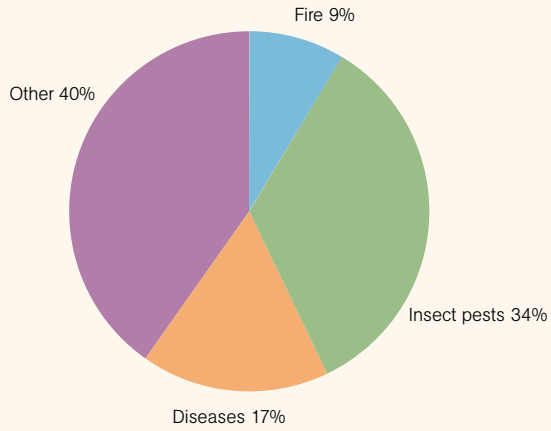


TABLE 16
Forest disturbances

	Disturbances affecting forests, average 1998–2002 (1 000 ha)				
	Fire	Insects	Diseases	Other	Total
Europe excluding Russian Federation	326	1 400	2 178	7 038	10 942
Russian Federation	1 268	4 953	957	508	7 686
Total Europe	**1 594**	**6 353**	**3 135**	**7 546**	**18 628**

The thirty-third session of the European Forestry Commission (FAO, 2006f), in discussing the vulnerability of the region's forests, considered how sector policy-makers could reduce forest vulnerability to extreme climatic events, insect pests, fire, climate change and other threats. Several countries have compiled or are compiling information on their experiences in responding to disasters as a basis for future emergency action.

The absence of baseline data for earlier reporting periods makes it difficult to determine whether forest health is improving or declining. However, if from 2 to 6 percent of forest area is affected in an average year, clearly the cumulative effects and the long-term consequences, including economic impacts, can be significant.

PRODUCTIVE FUNCTIONS OF FOREST RESOURCES

In Europe, 73 percent of total forest area is designated primarily for production (52 percent, excluding the Russian Federation), compared with a global average of 31 percent (Table 17).

The area of Europe's forests designated primarily for production declined significantly in the 1990s, but remained relatively stable during 2000–2005. The concept of forests for production is less applicable in Europe than in some other regions, because most forests in Europe are designated for multiple use, which includes production and protection.

Country data suggest an increase in the total growing stock in many countries, especially in areas of Central Europe where conservative silviculture and weak markets have brought growing stock per hectare to record high levels. The net result at the regional level is an increase both in total growing stock in cubic metres and in cubic metres per hectare (Table 18).

With the Russian Federation excluded, growing stock in Europe increased at a rate of 1.3 percent per year over 2000–2005, slightly lower than the rate of 1.4 percent in the 1990s. Growing stock also continues to increase slightly in the Russian Federation, but Russia has lower growing stock per hectare than the rest of Europe. This is to be expected, considering its vast forest areas in colder regions. The Russian Federation accounts for almost 19 percent of the world's total forest growing stock, about the same as Brazil, the other leading country in this regard.

Another indicator of the productive functions of forests is the level of wood removals. During 2000–2005, wood removals increased at about 2 percent per year for Europe as a whole. This was led by a strong rebound in the Russian Federation, where wood removals had declined sharply in the 1990s (Figure 28).

Regarding NWFPs, European countries reported removals of about 272 000 tonnes of food products from forests in 2005 (about 6 percent of the world total); 6 500 tonnes of raw material for medicine and aromatic products (5 percent); and 232 000 tonnes of other plant products (18 percent) (UNECE/FAO, 2005).

Europe's forests are among the primary producers of wood in the world. Excluding the Russian Federation, Europe accounts for 23 percent of the world's industrial roundwood removals, but only 5 percent of the world's forest area. When the Russian Federation is included,

TABLE 17
Area of forest designated primarily for production

	Area *(1 000 ha)*			**Annual change** *(1 000 ha)*	
	1990	**2000**	**2005**	**1990–2000**	**2000–2005**
Europe excluding Russian Federation	105 754	98 931	99 007	–682	15
Russian Federation	664 754	623 120	622 349	–4 163	–154
Total Europe	**770 508**	**722 051**	**721 355**	**–4 846**	**–139**
World	**1 324 549**	**1 281 612**	**1 256 266**	**–4 294**	**–5 069**

TABLE 18
Growing stock

	Growing stock					
	(million m^3)			*(m^3/ha)*		
	1990	**2000**	**2005**	**1990**	**2000**	**2005**
Europe excluding Russian Federation	22 024	25 103	26 785	124	135	141
Russian Federation	80 040	80 270	80 479	99	99	100
Total Europe	**102 063**	**105 374**	**107 264**	**103**	**106**	**107**
World	**445 252**	**439 000**	**434 219**	**109**	**110**	**110**

FIGURE 28 Wood removals

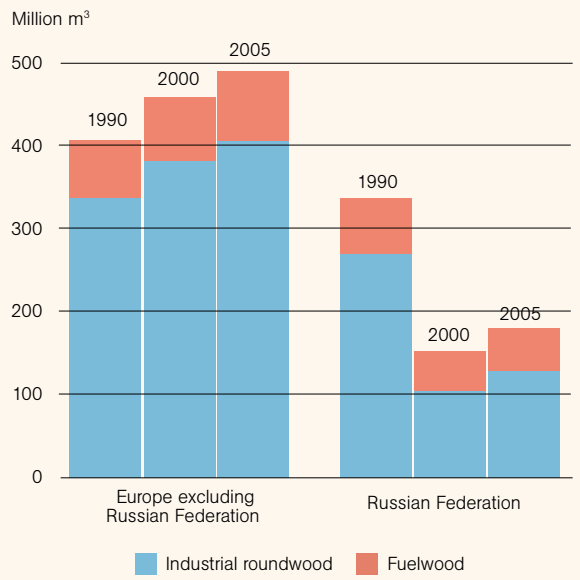
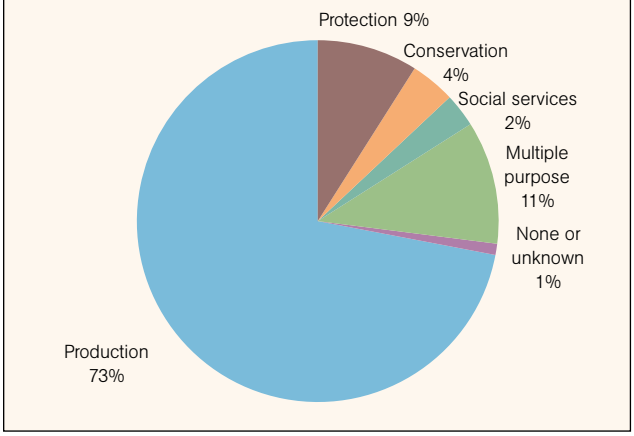


FIGURE 29 Designated primary functions of forests, 2005



Europe accounts for 30 percent of industrial roundwood and 25 percent of forest area. Over half of Europe's forests are designated for production, much higher than the global average of 32 percent. However, as mentioned, many of the forest areas in Europe that are designated for production are also designated for other uses.

When this information is combined with the fact that Europe's forest area and growing stock continue to increase, an obvious conclusion is that a high level of wood production is not incompatible with sustainable forest management – at least not in a region of the world characterized by relatively developed economies and institutions and by relatively homogeneous (and species-poor) forests with a high proportion of commercial species. Furthermore, removals are still well below the annual increment (UNECE/FAO, 2005).

PROTECTIVE FUNCTIONS OF FOREST RESOURCES

Forest area designated primarily for protection in 2005 accounted for 9 percent – the same as the global average (Table 19). However, not all countries use this designation, and some protective functions may be included under "multiple purpose" (Figure 29).

In Europe, protective forest plantations are increasing mainly in the Russian Federation, where they account for 30 percent of total forest plantations, compared with 9 percent in the rest of Europe. In many parts of Europe, notably in mountainous regions, protective functions are performed by existing natural or semi-natural forests.

The increasing trends in forest area designated primarily for protection and in protective forest plantations are indications that countries in Europe have recognized the importance of the protective functions of forests (in many cases for centuries). Concern about maintaining protective functions is behind the forest laws in many countries, notably in mountainous regions. Even though considerable research has been carried out on the benefits of forest protection, the fact that these benefits are not valued in the marketplace and are highly site specific continues to make it difficult to quantify them. The two parameters reported here are not sufficient to draw conclusions about the protection of air, water or soil quality in the region.

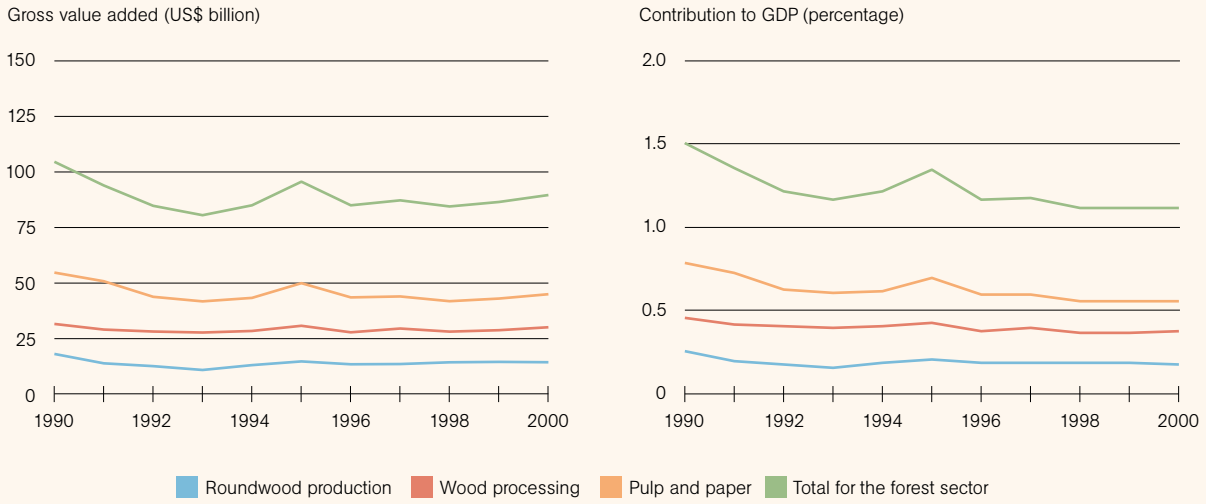
SOCIO-ECONOMIC FUNCTIONS

Europe accounts for about 22 percent of the value of industrial roundwood removals. Its share of the global

TABLE 19
Area of forest designated primarily for protection

	Area (1 000 ha)			Annual change (1 000 ha)	
	1990	2000	2005	1990–2000	2000–2005
Europe excluding Russian Federation	19 010	19 214	19 543	20	66
Russian Federation	58 695	70 386	70 556	1 169	34
Total Europe	**77 705**	**89 599**	**90 098**	**1 189**	**100**
World	**296 598**	**335 541**	**347 217**	**3 894**	**2 335**

FIGURE 30 Trends in value added in the forest sector, 1990–2000



value of total wood removals has increased from 20 percent in 1990 to 22 percent in 2005. The increase has been mainly at the expense of Asia, whose share of the value of wood removals declined throughout the 1990s and continued to decline over 2000–2005.

When the net trade of forest products is considered (of both primary and secondary products), Europe leads the world as a net exporter. The sharp increase in the dollar value of European exports tends to coincide with the strengthening of the euro vis-à-vis the United States dollar.

In Europe, roundwood production accounts for only 16 percent of the total value added, compared with 34 percent for wood-processing industries and 50 percent for pulp and paper.

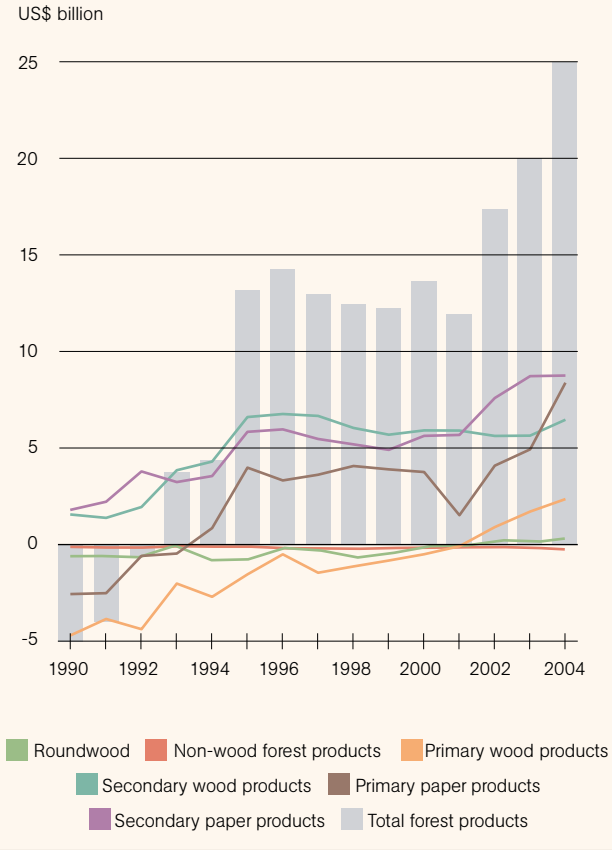
The data indicate a decline in value added in the forest sector in the early 1990s because of the collapse of the Russian forest sector, followed by recovery in 1995 and a levelling off in the late 1990s (Figure 30). The forest sector's contribution to GDP in Europe fell from 1.5 percent in 1990 to about 1.2 percent in 1992 and remained relatively stable thereafter.

The value of forest products trade is increasing in all parts of Europe, but the percentage increase is especially significant in Central and Eastern Europe (including European Union accession countries and other countries with economies in transition) (FAO, 2006b). The value of both exports and imports of forest products is steadily increasing.

Europe has been a net exporter of forest products since 1993 (Figure 31). Of special note are the upward trends in primary paper and wood products, and the strong surplus position in markets for secondary products. The value of exports exceeded the value of imports by US$25 billion in 2004, more than double the amount of only three years earlier.

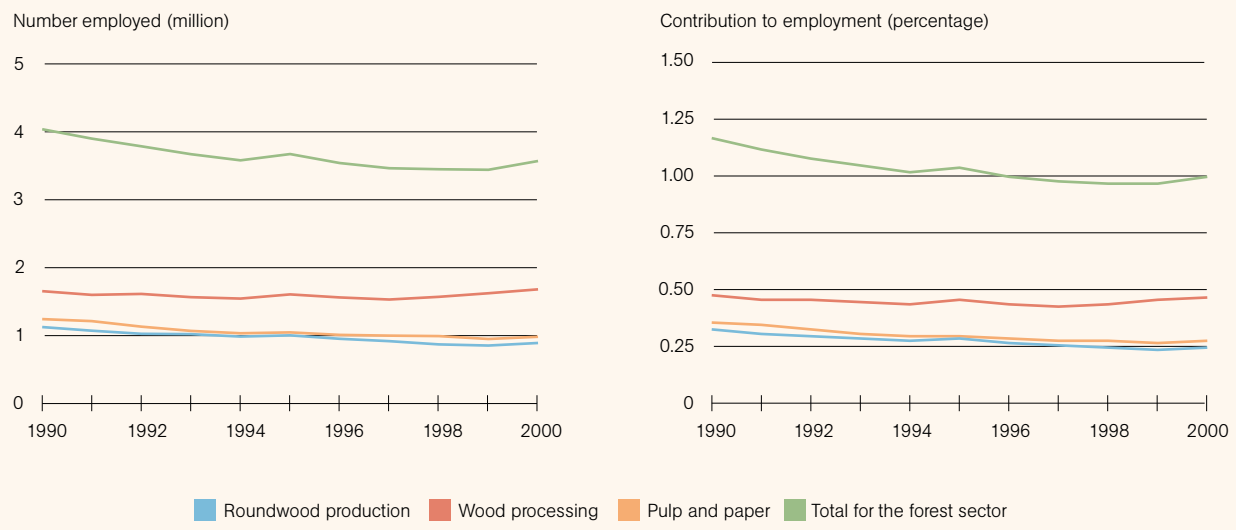
While the increasing value of trade in forest products is impressive, it is nonetheless dwarfed by the increasing value of trade in other products and services. The value of forest products exports has declined as a share of the total value of all exports, both in Europe and in the

FIGURE 31 Trends in net trade of forest products by subsector



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

FIGURE 32 Employment in the formal forest sector



world as a whole. This decline is the most dramatic in Nordic countries, where the value of these exports increased by US$10 billion per year from 1990 to 2004. However, in percentages, this represents a decline from 21 to 13 percent of the total exports of the three Nordic countries included in this analysis (mainly resulting from the rapid rise of the telecommunications industry and other economic sectors).

Employment levels in the forest sector are declining (Figure 32), as labour productivity has been rising faster than production (UNECE/FAO, 2005).

The contribution of the forest sector to GDP has declined over the long term as other sectors, including services, have increased. As mentioned in the previous section, the marketplace tends to undervalue the protective functions of forests. However, the forest sector remains economically significant in the Baltic and Nordic countries.

LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

"Some aspects of European forestry policy have remained remarkably stable" in the recent past (UNECE/FAO, 2005): commitment to ensuring that forest area should not decline; highly regulated forest harvesting; the requirement to replant forests after harvesting; widespread acceptance of multiple-purpose forestry practices; and tax and payment incentives that favour retention of forests and conversion of agricultural land to forest.

Forest policies are also changing in some respects, including a strong trend towards public involvement in policy-making.

In 2000, about 90 percent of Europe's forests were publicly owned and 10 percent privately owned. This statistic is heavily skewed by the Russian Federation. Excluding the Russian Federation, well over half of Europe's forests are privately owned (62 percent in the European Union).

The most important recent changes in the legal framework for forestry in Europe have taken place in Eastern Europe, where a majority of countries have reported an increase in private ownership of forests (FAO, 2006e). In several countries, the area of privately owned forests has increased by a factor of three or four in the years since the fall of the Union of Soviet Socialist Republics. However, forest ownership in the Russian Federation and the Commonwealth of Independent States remains almost 100 percent public.

An interesting trend has been the reorganizing of state forest management organizations to function as quasi-private companies, with commercial objectives and more flexibility to manage forests without following strict bureaucratic rules. Austria, Finland, Ireland, Latvia, Poland and Sweden have all made changes along these lines.

The goals of European policies, laws and institutions are remarkably similar: to promote sustainable forest management and conservation (Bauer, Kniivilä and Schmithüsen, 2004). Every country in Europe has laws and policies in place that make it very difficult to convert forests to other uses. This is true in countries where virtually all forests are owned by the state, and it is equally true in countries (mainly in Western Europe) with a large number of private forest owners.

SUMMARY OF PROGRESS TOWARDS SUSTAINABLE FOREST MANAGEMENT

It is tempting to conclude that Europe has achieved sustainable forest management. The negative trends are largely offset by positive ones. Key indicators, including forest area, are stable or increasing, and most countries have enacted, and are capable of enforcing, laws that result in the effective protection of forests.

However, a number of disturbing trends remain:

- Forest health is adversely affected by fire, storms, insect pests and disease, all of which may increase if global warming continues.
- Climate change poses a threat to Europe's forests, although some areas may well benefit, for example from longer growing seasons.
- Employment in the forest sector continues to decline as the workforce continues to age and labour productivity increases because capital is replacing labour as the most important production factor.
- The contribution of forests to Europe's economy will most likely continue to fall if prices for forest products remain stagnant. Globalization is changing the forest sector along with the rest of the world economy.

The *European Forestry Sector Outlook Study* (UNECE/FAO, 2005) concluded that European forests are sustainable in the long term, but with caveats in all areas of sustainable development – economic, social and environmental.

Europe's leaders face many challenges, including constraints on public finances, an ageing workforce and unanswered questions about long-term economic viability – such as the impact of stagnant prices for forest products. The uncertain impact of climate change on forest ecosystems looms over Europe and the rest of the world.

However, there are also many positive trends on which to build, starting with the fact that Europe has successfully halted and reversed the historical loss of forest area. With MCPFE, Europe has in place a strong political process to support the forest sector.