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Susanna Kankaanpää and Timothy R. Carter

An overview of forest policies affecting land use in Europe



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Foreword

This study presents an overview of forest policies as they affect land use in fourteen pre-enlargement European Union countries, Norway and Switzerland. The study was undertaken to provide background material for the construction of Europe-wide land use change scenarios as part of a European Commission-funded research project (ATEAM). Policies are important driving forces of land use change in Europe, and in many cases can be a major determining factor. The study focused on the targets of Europe-wide and national forest policies, using these as indicators of the likely direction and possibly also magnitude of future changes in the forested area of Europe. The forest land use change scenarios derived from this analysis are published in a separate report in the Finnish Environment series (Kankaanpää and Carter 2004). We hope that in addition to scenario analysts, planners and decision-makers may also find the descriptive information about national and EU-wide forest policies and trends presented here of some value in their work. However, an in-depth analysis and evaluation of the forest policies themselves was outside the scope of this study.

Susanna Kankaanpää and Timothy Carter

Helsinki, March 2004

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Abbreviations

AHTEG	An ad hoc Technical Expert Group on Forest Biological Diversity
ATEAM	Advanced Terrestrial Ecosystem Analysis and Modelling
BML	The Federal Ministry of Food, Agriculture and Forestry, Germany
CAP	Common agricultural policy
CBD	The Convention on Biological Diversity
CFS	State Forest Service, Italy
CIFOR	Centre for International Forestry Research
COST	European Cooperation in the Field of Scientific and Technical Research
CPF	The collaborative partnership on forests
CSA	Canadian Standards Association
CSD	The United Nations Conference on Environment and Development
EAGGF	The European Agricultural Guidance and Guarantee Fund
EC	European Commission
ECE	Economic Commission for Europe
ECOSOC	United Nations Economic and Social Council
EEC	European Economic Community
EFC	European Forestry Commission
EFI	European Forest Institute
EFICS	The European forestry information and communication system
EFSOS	European Forest Sector Outlook Studies
ERDF	The European Regional Development Fund
EQUAL	A Community Initiative for new ways of tackling discrimination and inequality in the field on employment
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FRA	Forest Resources Assessment Programme
GDP	Gross Domestic Product
IFF	Intergovernmental Forum on Forests
INTERREG	A Community initiative which aims to stimulate interregional cooperation in the European Union
IPF	Intergovernmental Panel on Forests
ITFF	Interagency Task Force on Forests
IITA	The International Tropical Timber Agreement
ISTAT	National Institute of Statistics, Italy
ITTO	International Tropical Timber Organization
IUCN	The World Conservation Union
IUFRO	International Union of Forest Research Organizations
LEADER	The Community Initiative designed to help rural actors consider the long term potential of their region
LIFE	The Financial Instrument for the Environment, European Union
LULUCF	Land use, land use change and forestry
MCPFE	Ministerial Conferences on the Protection of Forests in Europe
MINA	The Flemish Environmental Policy Plan, Belgium
NDP	National development programme, Ireland
NFP	National Forest Programme
NPP	Net primary productivity
OFEFP	The Federal Board of Forestry, Switzerland
ONF	Forest National Office, France
PSDPF	Plan for Sustainable Development of the Portugese Forests, Portugal
RTD	Research, technological development and demonstration

SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SEA	Strategic environmental assessment
SSSI	Site of Special Scientific Interest, UK
UAA	Utilised agricultural area
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
UNEP	United Nations Environment Programme
URBAN	The Community Initiative for sustainable development in the troubled urban districts of the European Union
VEN	Flemish Ecological Network, Belgium
VTT	VTT Technical Research Centre of Finland
WWF	World Wide Fund for Nature

Abstract

Policies are recognized as one of the main driving forces of land use change in Europe. This study presents an overview of forest policies and trends both EU-wide and at national level in Europe. The study is part of the European Commission-funded ATEAM (Advanced Terrestrial Ecosystem Analysis and Modelling) project which is investigating the potential effects of future global environmental change on ecosystem services in Europe. An essential element of the ATEAM project is the development of land use scenarios for Europe for the 21st century. The focus of this report is on forest policies and strategies that directly or indirectly affect land use. This information provided background material for the construction of forest land use change scenarios that are presented in a separate report.

There has been an evident change in both the physical qualities of European forests and in their functions during recent decades. The functions of forests have become more diverse and the provision of different kinds of services has grown in importance at the expense of timber production. The trend towards multi-purpose forestry and forests is clear in Europe and the trend can be assumed to continue for decades to come.

The forest policies of most European countries presented in this report have been revised or completely changed during the 1990s. There has been a shift towards the post-industrial forest paradigm, which includes changes in management objectives, species composition, location, management styles and approaches, and values of forests. The changed forest policies have several characteristics in common: the objectives of the new forest laws include a balance between economic, cultural, and environmental functions of forests, new laws are in conformity with the UNCED principles and other international agreements on forests, National Forest Programmes are prepared with a participatory, open and holistic approach, policy planning is cross-sectoral and sustainable forest and close-to-nature management approaches have been adopted. Changes in forest policy have also included restructuring of the forest administration in some countries, usually toward decentralization.

Current forest policies in Europe, if implemented, will have an impact on the area, location and purpose of forests, their management and species composition. They are likely to change the physical environment and landscape adjacent to large numbers of people, and have impacts on national economies and society at large. On the ground the changes will take a long time to materialize, partly due to the natural characteristics of forests and partly because it can take time before new management regimes are adopted. The present policies set trends for future development, providing an indication of the likely directions of change in European forests. Such background information could be of value to decision makers and planners concerned about the long-term future of European forests.



Background

Public policies are widely recognised as being one of the most important factors determining the outlook of the forestry sector and at least as important as economic or technical trends (European Timber Trends, 1994). Policies are also considered to be one of the major driving forces of land use change in Europe. This overview was prepared as part of a study to estimate forest land use change in Europe in the 21st century and to develop forest land use change scenarios. The work has been carried out within the European Commission funded ATEAM-project (Advanced Terrestrial Ecosystem Analysis and Modelling¹). The main objective of ATEAM is to assess the vulnerability of ecosystem services relevant to human activities with respect to global environmental change.

1.1 Purpose of the study

The aim of this study is to examine EU-wide and national policies and trends in the European forest sector. The focus is on forest policies that can have an impact on future land use change in Europe. In this respect, the report may be of interest to decision makers, planners and researchers concerned about future developments in European forests. The study has also been used as background material for the construction of forest land use change scenarios for Europe, which are presented in a separate report (Kankaanpää and Carter 2004).

1.2 Materials and methods

The report is based on an extensive literature and Web-based review. Material analysed for the study was collected from various available official documents and scientific studies. In addition, the Web pages of forest authorities and organisations were also used, as the most recent policies are often only available on the Internet. The native language versions of these pages were used as sources whenever possible. Other surveys and research on forest policies in Europe include the Economic Commission/Timber Section (1994), Pelkonen et al. (1999), Schmithüsen et al. (2000), Cirelli and Schmithüsen (2000), the COST E19 Action (2000)², FAO Forest Resources Assessment Programme (FRA 2000)³, the ongoing project of Forests and Forest Clusters in Europe (European Forest Institute)⁴ and the European Forest Sector Outlook Studies (EFSOS)⁵.

¹ <http://www.pik-potsdam.de/ateam/>

² <http://www.metla.fi/eu/cost/e19/index.htm>

³ http://www.fao.org/forestry/fo/country/nav_europe.jsp?lang_id=1

⁴ <http://www.efi.fi/projects/project.phtml?id=3589C>

⁵ <http://www.unece.org/unece/trade/timber/efsos/welcome.htm>

The emphasis in this study is on the forest policies that directly or indirectly affect land use and land use change. Afforestation schemes are an example of forest policies that can have objectives others than land use (such as reducing overproduction in agriculture), but have an impact on forest land use change in Europe.

The overview covers the present (June 2003) member states of the European Union (excluding Luxemburg) plus Norway and Switzerland – 16 countries in all. These are the countries covered by the ATEAM project. Forest protection policies are presented separately from the general forest policies for each country, as the protected areas were considered as a separate and central class in the ATEAM land use classification.

The EU-wide and national forest policies were collected as comprehensively as possible and their objectives identified and described as they were seen to relate to land use. An effort was made to identify common trends and to group the individual countries according to their similarities in forest policies and trends. Policies and the shifts in forestry practices indicated in the policies were analysed in light of the forest paradigm change described by many authors (e.g. Palo et al. 1999; Mather 2000, 2001; Slee 2000; Schmithüsen 2000; Madsen 2002; Helms 2002). The objectives of the policies were described and were seen as intentions of how the policies are meant to be implemented and to function. It was beyond the scope of this study either to describe how the policies have actually worked or to assess their effectiveness in achieving their objectives. There are several questions concerning the determination of policy objectives, such as whose goals should be focused on, the nature of the goals, time scales, changing objectives over time and the difficulty of identifying and evaluating procedural goals. As an effectiveness assessment was not carried out in this study, these questions were not addressed explicitly. The public policy objectives tend to be vague, multiple and conflicting as a result of the process of policy formulation, and it should be borne in mind that the goals described in the policies may not be implemented, or they may have unintended effects within and outside the target area of the policy (Mikwitz 2002; Hilden et al. 2002).

The report first covers EU-wide policies, and then treats national forest policies (for the 16 countries within the ATEAM project). The national policies are described in separate sections for each country, which are then summarised in a table at the end of the report.

1.3 Definitions

Forest. Some relevant forest-related definitions are given in this section. The question of "what is a forest?" is pertinent in discussion of afforestation and deforestation and other global forest issues and controversies. The definition of a forest also has implications for forest policy. There is no one uniformly accepted definition of a forest and concepts vary between developed and developing nations. Also within Europe, the term forest is understood in different ways. Nevertheless, there are some international definitions for forests, notably those used by the Food and Agriculture Organization of the United Nations (FAO) and the United Nations (Palo and Uusivuori 1999, p. 4; Päivinen et al 1999, p. 13). There has also been extensive discourse on forest-related definitions and their harmonization and a report has recently been published on the work carried out by FAO, the Intergovernmental Panel on Climate Change (IPCC), the Centre for International Forestry Research (CIFOR) and the International Union of Forest Research Organizations (IUFRO) (Puustjärvi and Simula 2002).

There are several definitions for forest in the literature. They can be grouped into three categories: administrative or legal unit, land cover, and land use (Lund 1999, p. 127). The FAO Global Forest Resource Assessment 2000 (2001, p. 363) uses the following definition for forest:

“Forest includes natural forests and forest plantations. It is used to refer to land with a tree canopy of more than 10% and an area of more than 0.5 ha. Forests are determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 m. Young natural stands that have not yet but are expected to reach a crown density of 10% and tree height of 5 m are included under forest, as are temporarily unstocked areas. The term includes forests used for purposes of production, protection, multiple-use or conservation (i.e. forest in national parks, nature reserves and other protected areas), as well as forest stands on agricultural lands (e.g. windbreaks and shelterbelts of trees with width of more than 20 m), and rubber wood plantations and cork oak stands. The term specifically excludes stands of trees established primarily for agricultural production, for example fruit tree plantation. It also excludes trees planted in agroforestry systems”.

UN/FAO define a forest in developed countries as land with a tree crown cover of more than about 20% of the area. Continuous forest comprises trees usually growing more than 7 m in height and able to produce wood. This includes both closed forest formations where trees of various storeys and undergrowth cover a high proportion of the ground, and open forest formations with a continuous grass layer in which tree synusia cover at least 10% of the ground. (Päivinen et al. 1999, p. 13).

Other wooded area is land which has some forest characteristics but is not forest as defined above. It includes open woodland and scrub, scrub and bush land whether or not used for pasture or range. It excludes land occupied by trees outside the forest (Päivinen et al. 1999, p. 13). The FAO Global Forest Resource Assessment 2000 defines other wooded land as (Puustjärvi and Simula 2002):

“land that has either a crown cover (or equivalent stocking level) of 5 to 10 percent of trees able to reach a height of 5 m at maturity; or a crown cover (or equivalent stocking level) of more than 10 percent of trees not able to reach a height of 5 m at maturity; or with shrub or bush cover of more than 10 percent”.

Exploitable forest is forest and other wooded land on which there are no legal, economic or technical restrictions on wood production. It includes areas where, although there are no such restrictions, harvesting is not currently taking place, for example areas included in long-term utilisation plans or intentions (Päivinen et al 1999, p. 13).

Productive forest is described as a forest area, where the annual growth of timber must be greater than 1 m³/ha. In Scandinavia, the concept of forest is based on this definition of productivity. For forest land where the mean annual increment of growing stock is 0.1-1 m³/ha, the term *scrubland* is used, and areas where the increment is less than 0.1 m³/ha are *wasteland* (Parviainen et al. 2000).

Forest plantation is a forest established by planting and/or seeding in the process of afforestation or reforestation. It consists of introduced species or indigenous species (FAO Global Forest Resource Assessment 2000). According to a UNEP definition, plantation forest may be afforested land or a secondary forest established by planting or direct seeding. A gradient exists among plantation forests from even-aged, single species monocultures of exotic species to mixed species, native to the site, that can have also biodiversity objectives in addition to the fibre production objectives (Puustjärvi and Simula 2002).

Definitions of *protected forests* vary greatly within Europe. Forests can have protective functions such as protection against erosion or avalanches, but these should be distinguished from the protected forests. The latter, in contrast to wood production areas, are mainly conserved for the maintenance of biodiversity. In the Nordic

countries the primary goal of forest protection has been the preservation of old forests, whereas in central Europe forests are protected as parts of the landscape, as cultural features or as specimens of original forests (Parviainen et al. 2000).

Forestry is the science, art and practice of managing and using for human benefit the natural resources of forest lands. Forestry includes a wide range of activities in addition to those associated with silviculture, which refers to the planting and tending of growing trees. Forestry also includes the production of non-timber products, watershed management, wildlife protection, and eco-tourism as well as pest control and fire management (Watson et al. 2000, p. 62).

Forestry is one of society's many land use systems. Forestry is assigned the role of an institution through which society gets access to the different functions of forests. Concepts of forestry may vary markedly between different social systems. However, in order to function as part of the social system, forestry has to be consistent and contingent with the other parts of the system and the system as a whole. In this sense, perspectives on forestry are to a large extent predetermined by their specific surrounding social systems. As a result, any changes in the social system inevitably lead to changes in forestry, and vice versa. Due to the mediating role between forest ecosystems and societal demands assigned to forestry, changes in forestry have been interpreted mainly as a reaction towards changing forest uses in society. A closer look, however, reveals not only changes in the direct relationship between society and forests, but also other social changes which have the potential to affect forestry (Schanz 1999, pp. 61-62). Analysing these social changes is relevant in the estimation and understanding of future forest land use change in Europe.

FAO (1998) defines *managed forest* as forest that is managed in accordance with a formal or an informal plan applied regularly over a sufficiently long period (five years or more). According to Puustjärvi and Simula (2002), the UN Framework Convention on Climate Change (UNFCCC) defines *forest management* as:

"a system of practices for stewardship and use of forest land aimed at fulfilling relevant ecological (including biological diversity), economic and social functions of the forest in sustainable manner".

Forest policies and strategies in Europe emphasize sustainable forest management and in some cases close-to-nature management. Definitions for these terms are given below.

Sustainable forest management. This is defined either by the Glossary of Forestry terms (2001) as:

"management regimes applied to forest land which maintain the productive and renewal capacities as well as the genetic, species and ecological diversity of forest ecosystems".

or by the Canadian Standards Association CSA (1995 – in Evans 1996) as:

"management to maintain and enhance the long-term health of forest eco-systems, while providing ecological, economic, social and cultural opportunities".

or by the Ministerial Conferences on the Protection of Forests in Europe (MCPFE 2000, p. 80) as:

"the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality and their potential to fulfil, now and in the future, relevant ecological, economic and social functions, at local, national, and global levels, and that does not cause damage to other ecosystems."

Close-to-nature silviculture is defined by the Forest Service of Ireland (Native Woodland Sceme 2001) as:

"forest management where natural processes such as windthrow and fire are emulated and processes such as natural regeneration are encouraged in order to manage age and species diversity while reducing management costs".

Natural or close-to-nature forestry according to Dafis (2001, pp. 22-23), is based on natural regeneration and continuous cultivation of forests and the preservation of forest's natural structures (i.e. a forest with uneven-aged trees and a variety of species). Forest is seen as a product of natural processes, as opposed to artificial, human intervention, and its management is dictated by the principle of conscious exploitation of the natural process and the minimization of input of additional energy.

The Danish National Forest Programme (2002, p. 22) defines *near-to-nature forest management* as a concept which only relates to the actual forest operations and is therefore a narrower concept than sustainable forest management. The primary goal is to ensure an economically sustainable wood production through selection of species adapted to/adaptable to the local conditions. Maximum utilisation of the natural processes in the forest ecosystem, such as natural regeneration and continuity of the forest cover, are to be applied. A forest managed according to the near-to-nature concept will typically consist of a mixture of different tree species in different age groups, with a limited use of pesticides and other ancillary materials.

1.4 Structure of the report

In section 2.1 some forest growth trends and in 2.2 institutional and social trends in Europe are described. In section 3, international agreements and conventions on forests, namely the Intergovernmental Panel on Forests (IPF), Intergovernmental Forum on Forests (IFF), United Nations Forum on Forests (UNFF), Ministerial Conferences on the Protection of Forests in Europe, the concept of National Forest Programme and international environmental agreements are presented. Forest policy in the European Union is described in section 4. and national forest policies in each of the 16 countries in section 5.

Forest trends in Europe

2.1 Trends in the growing stock of timber

2.1.1 Growth statistics

Changes in the growth of forests are recorded as increment statistics. In order to understand these, it is necessary to define a number of basic concepts:

- The *growing stock* is the sum of volume, over bark, of all living trees of all ages exceeding the measurement threshold.
- *Gross increment* is the total increase of the growing stock during a given time period, consisting of the increment of those trees which were part of the growing stock in the beginning of the period, and trees exceeding the measurement threshold during the time period. The threshold level varies in different European countries; for instance in Finland it is the diameter at 1.3 meters breast height and in Switzerland there is a minimum of 12 cm at breast height.
- *Net increment* is the part of the gross increment excluding trees which have died of natural causes during a given time period (natural losses)
- Natural losses and fellings together constitute the *drain*
- *Forest balance* is the difference between the gross increment and the drain. Forest balance shows the total change of the growing stock between two time periods.
- Fellings are further divided into *removals* and *logging residues*. Removals are transported out of the forest and have been recorded either as over- or underbark volume (Pisarenko et al. 2001, 28; Päivinen et al. 1999, p. 126).

2.1.2 Factors affecting growth increment

The possible reasons for changes in the net increment can be divided into three main groups:

1. Changes in forest structure will automatically cause changes in increment. The characteristics of the forest structure include mean volume of growing stock, age class structure and tree species distribution. Abandonment of detrimental forest land use practices (such as heavy exploitation of forests) has increased the productivity and growth of forests.
2. The definitions of increment, or forest and forest area, growing stock, may change. Also more accurate measurement methods can change increment figures.
3. Environmental changes affect the increment. Changes in the environment are partly due to intensive forest management, such as draining of peatlands and fertilization. Indirect human-induced environmental changes affect the increment as well, but their impacts are not fully understood. These factors include climate change and deposition of different chemicals. Rising CO₂ has been shown by many studies to increase forest net primary productivity (NPP). Atmospheric N deposition has also been estimated to accelerate forest growth. However, European regions and forest types differ greatly and responses will also have changed over time (Päivinen et al. 1999, pp. 126-127; Glazel 1999, p. 65, 73; Cannell 1999, p. 36-37; Parry 2000, p. 144).

2.1.3 Trends in growth and area

The European forest resources covered a total area of slightly more than 150 million ha in 1995. The average forest coverage of the continent was 31% in 1995; forest coverage was largest in Northern Europe (46%) and lowest in Western Europe (24%) (FAO 1997, in Mery et al. 1999, p. 266). 85% of European forests are classified as productive forests.

Forest areas in today's industrialized countries are slightly expanding. Between 1990 and 1995 the annual rate of change was 0.3%. The European forest area increased by 1.9 million ha between 1980 and 1990. Losses of forest land to other land uses, especially infrastructure building and urbanisation, were outweighed by increased afforestation of abandoned agricultural land and natural afforestation (Mery et al. 1999).

In a study of international forestry statistics, Päivinen et al. (1999) discovered that the total forest area of European countries (excluding the former USSR) increased from 135.6 mill ha in 1950 to 149.3 mill ha in 1990, though the area of exploitable forest remained rather stable. The growing stock of exploitable forest has increased by 43% (from 13 billion m³ in 1950 to 18.5 billion m³ in 1990) and the net annual increment by 55% over 1950-1990. A large increase in volume occurred, for example, in Austria, France, Germany, Italy and Sweden. Only a few countries showed negative development between 1980 and 1990 (Albania, Greece, Portugal and Romania). A significant increase in net increment can be found in Austria, Finland, France, Germany, Spain and Sweden. Only two countries had a decreasing trend between 1980 and 1990 (Albania and Greece). The recorded fellings have always been below the net increment: in 1950 they were 96.4% of the net increment and in 1990, 70%. As a consequence, the forest balance has been positive in Europe during 1951-1990.

The growth rates of many European forests have accelerated substantially during the last 100 years. Growth increases have been of the order of 40% in Southern Sweden, commonly 50% and exceptionally 250% in Southern Germany, 24-80% in Austria and 50-160% in France (Cannell 1999, pp. 25-26).

Glatzel (1999, p. 73) presents historic forest use as one of the causes of accelerated forest growth. Before the use of fossil fuels, forests in Europe were heavily exploited for energy production, accumulated mineral nutrients and other non-timber forest products. The land use practices of grazing on forest land and extensive clear cuts, monocultures and intensive harvesting to supplement agriculture, led to degradation of forest ecosystems and soils to a low level of productivity and plant diversity. This low level was maintained for a long time by steady biomass exports, creating an impression of stability. When agriculture started to rely on chemical fertilizers and intensive pastures, forest ecosystems began to recover and the deposition of atmospheric nitrogen from anthropogenic sources enhanced this process. In theory, this should have promoted more varied ecosystem dynamics, the return of nutrient demanding plant species and increased growth.

From 1961 to 1995 the length of the growing season in Austria increased by 14 days, associated with an average annual temperature increase of over 1°C. The number of days with snow cover, which is one of the main limiting factors for plant growth in Austria, has decreased in the 1980s. Similar results are repeated over large areas of central and northern Europe (Hulme and Carter, 2000). In a study of climate variations and tree growth in Austria, Hasenauer et al. (1999, pp. 83-84) found that the growing season length can have profound effects on the functional aspects of ecosystems. The long term effects of such stimuli on trees, however, are unknown.

2.2 Institutional and social trends

2.2.1 Forest paradigm change

Two major trends in the function and composition of forests are apparent in Europe. First, there has been a shift towards multi-functionality of forests and a shift in emphasis of forests seen as primarily sources of wood, to forests satisfying a wide diversity of ecological and societal needs and uses. Second, forests have become substantially, but not exclusively, providers of environment and amenity-related goods. Related to this shift is a swing from private profits to public benefits. The timing and extension of the transition from the wood production use of forests to the post-industrial paradigm vary between the different parts of Europe. Nevertheless, despite such variations it can be argued that continent-wide trends can be discerned, for example in the resolutions of the Ministerial Conferences (Mather 2000, p. 14; Slee 2000, p. 81; Helms 2002, p. 4).

The shift towards the post-industrial forest paradigm (Table 1) is a manifestation in forestry of post-productivist trends, according to Mather (2001, p. 251). It represents more than simply a shift towards multiple-use forestry, though it may incorporate that shift, and it includes changes in the means of forestry as well as in the ends. It also represents a change in who decides both means and ends. The traditional sovereignty of the forestry administration and professionals is challenged and significant changes in the administrative infrastructure of forestry have occurred.

Regulation, in the widest sense, is a feature of the post-industrial forest. The desired public benefits from privately owned forests are attained through some form of regulation, usually consisting of a mixture of incentives and restrictions (Mather 2000, p. 14).

Changes in forestry policies and practices reflect a fundamental change in society and its values. Post-productivism is not simply a response to overproduction, but is the result of more deep-seated and fundamental factors in society. These may include the degree of affluence and the amount of leisure time. People and their elected representatives have changed from having a dominant rural orientation to being urban-based, which has changed the values and priorities of both the people and the institutions. Changing policies are linked to cultural changes, even if the relationship is mediated through power relations which themselves change through time (Mather 2001, p. 262; Helms 2002, p. 4).

Changes in the function and composition of forests have also affected the locational pattern of the new forests. Lowland habitats suitable for broadleaved species and areas close to urban centres have been afforested as opposed to the previous afforestation of uplands and remote areas.

Table 1. Characteristics of the industrial and post-industrial forest (Mather 2001, p. 252). Distinctive emphases are listed; it is not implied that, for example, timber production is wholly irrelevant in the post-industrial forest.

	Industrial forest	Post-industrial forest
Management objective	Timber production Monofunctional	Environmental services Multifunctional
Typical composition	Even-aged/conifers	Mixed age and species
Typical location	Peripheral/ remote/ upland	Peri-urban/ lowland
Values	Instrumental	Intrinsic
Ethos	Rational	Emotional
Management style	Authoritarian	Consultative
Management approach	Mechanistic/ reductionist	Organic/ holistic

2.2.2 Institutional and policy changes

The paradigm shift in forestry and the accompanying underlying changes in attitudes are reflected in forest policies and institutions. There have been various reforms of forestry and related environmental legislation in many European countries. The protection of forests has increased and environmental forest management or close-to-nature management have replaced wood production management. Nevertheless, land use patterns are quite stable in Europe, and biological processes are generally slow. Although social changes and developments in the institutional and legal framework may happen rapidly, the effects of these changes may take decades before they are visible on the ground (Palo 1999, p. 269; UN/ECE, 1999).

In many European countries the basic forest laws, as well as other relevant legislation such as environmental protection, were fundamentally overhauled in the second half of the 1990s. Forestry institutions and administrative structures have also undergone changes in some countries, and the processes of policy formulation have been modified or altered (UN/ECE, 1999)

The new forest laws aim to achieve a balance between the equally important economic, social, cultural and environmental functions of forests. The objectives of the new forest laws are more diversified and comprehensive than those of the previous laws. Forest laws address a wider range of private and public goods than solely wood production. The importance of both production and conservation is acknowledged. Forests are seen as multifunctional resources. There is a need to balance the different uses and functions of forests and to formulate management objectives that refer to forests as multifunctional renewable resources. (Schmithüsen 2000, p. 9)

The new forest programmes and strategies formulated since the end of the 1990s in Europe in general correspond well with the concept of national forest programmes endorsed by the Intergovernmental Panel on Forests (IPF) and the Commission on Sustainable Development (CSD). The national forest programmes are formulated and planned with an open, participatory and holistic approach, quite different from the traditional more technical approach conducted solely by forestry professionals. Planning has been cross-sectoral, and in many cases environmental bodies have taken part in the forest planning and policy formulation processes and also played a major role in it. Forest policies have been linked to rural development and environmental conservation policies and programmes (UN/ECE 2001).

The forest laws of many European nations have been revised to bring them into conformity with the UNCED principles (see section 3.1.) and the resolutions of the Ministerial Conferences on the Protection of Forests in Europe (see section 3.5.).

In general, co-operation in forestry issues is more intense than ever before. European countries are also participating in the development and implementation of criteria and indicators for sustainable forest management within the pan-European forestry process of the Ministerial Conference on the Protection of Forests in Europe. The criteria and indicators developed at the national scale are based on or fully compatible with those at pan-European level. The forest policies of the EU member states have also been brought into line with the broad EU objectives that have been stated in the EU forest strategy and the various directives and regulations (UN/ECE 1999).

The roles of national, regional and local authorities in the forestry sector have been changed in many countries by the new forest laws. There has been a trend in Europe to delegate forestry competencies to regional authorities. The regional authorities have become more strongly involved in forest policy formulation and implementation. The forestry planning processes have also become more

participatory in many European countries. The national forest programmes have been prepared with a participatory approach, but also in general the forestry planning processes have become less centralised in many countries. There has been a need to enhance local participation in the management of forest resources and to adjust forest management to local conditions. (Schmithüsen 2000, p. 9; Schanz 2000, p. 16; Reunala 2000, pp. 30-31; Mather 2001, p. 251, 261; Wiersum 2000, pp. 598-599)

Since the 1980s a range of policies have been designed to increase the area of forest and woodland across Europe. The afforestation programmes have been a response to the expected marginalisation of arable land because of agricultural overproduction. At the same time the concept of multipurpose forestry has been introduced in European forestry, and the newly afforested areas have been a testing ground for the concept. The shift of the goals of afforestation from agricultural arguments to environmental and recreational arguments has been gradual, but in some countries, like Denmark, the change has been complete (Madsen 2002, pp. 241-242).

For many European countries forestry is a significant recipient, direct or indirect, of public funds. Many forest enterprises, public and private, that were in the past net contributors to public finances are now net recipients of public funds. In Germany, forestry is facing an economic crisis and forest owners are no longer able to rely on significant financial profits from forestry. The main causes of the crisis include constant or decreasing real forest product prices, an increase in the cost of production, and limited opportunities to rationalise or enlarge the scale of output due to forestry being based on natural processes. Some European countries, such as Sweden and Finland, have an explicit principle that the forest sector should not be a net recipient of public funds. They are also countries where forestry and forest-based economic activities make a large contribution to national income. However, in Finland, for example, financial support is provided for private forest owners for forest management works, where the financial profitability would otherwise be low, and for the maintenance of biodiversity (UN/ECE 1999; Niskanen and Pirkola 1997, pp. 31, 33; Blum 1997, pp.35-36).

Forests offer many non-wood benefits, such as recreation, biodiversity or landscape. These benefits are usually outside the markets and bring no economic benefits to the forest owners. There is a need, therefore, for direct public financing to ensure the delivery of these public benefits. The future demand on forests for recreation and nature-based tourism is expected to become one of the major and increasing uses of European forest resources in the future. In many European countries, forests have lost their predominant role of wood production in the past decades. Other functions, such as water and soil protection, biodiversity preservation and recreation, have grown in importance. Many countries have taken the changing functions of forests into consideration within their forest policy formulation and planning. In Finland, much more than in the past, the forest planning and management policies include aspects of landscape and recreation issues. In Italy a deep revision of traditional forest management criteria is taking place to ensure that non-material functions and the increased recreation use of forests are taken into account in forest management and the policy formulation process. In the Netherlands a multiple-use policy is favoured, to combine nature conservation and recreational use of forests on a limited amount of land (Sievänen et al. 2000).

3

International conventions and agreements on forests

During the last twenty years there has been a substantial expansion of international conventions, agreements and principles on forests, which effectively form the basis for international forest policy. Their aim has been the sustainable management, use and protection of forests as part of the overall goal of sustainable development.

3.1 The United Nations Conference on Environment and Development UNCED

In the 1992 United Nations Conference on Environment and Development (UNCED) forests were among the most controversial issues being considered. The North-South polarisation of views concerning forests precluded any agreements other than the non-legally binding:

1. Chapter 11 of Agenda 21 "Combating Deforestation", and
2. Principles for Forest Management, Utilisation, Protection and Sustainable Development of All Types of Forests, known as the "Forest Principles" (United Nations Division of Sustainable Development 2000)

The *Agenda 21 plan of action on Combating Deforestation* has the following programme areas:

- Sustaining the multiple roles and functions of all types of forests, forest lands and woodlands
- Enhancing the protection, sustainable management and conservation of all forests, and the greening of degraded areas, through forest rehabilitation, afforestation, reforestation and other rehabilitative means
- Promoting efficient utilization and assessment to recover the full valuation of the goods and services provided by forests, forest lands and woodlands
- Establishing and/or strengthening capacities for the planning, assessment and systematic observations of forests and related programmes, projects and activities, including commercial trade and processes (United Nations Division for Sustainable Development 1999)

The *UNCED Forest Principles* state that forest resources and forest lands should be sustainably managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations. These needs are for forest products and services, such as wood and wood products, water, food, fodder, medicine, fuel, shelter, employment, recreation, habitats for wildlife, landscape diversity, carbon sinks and reservoirs, and for other forest products. Appropriate measures should be taken to protect forests against harmful effects of pollution, including air-borne pollution, fires, pests and diseases, in order to maintain the full multiple-value of forests.

Governments should promote and provide opportunities for participation of interested parties such as local communities, indigenous people and non-governmental organisations, in the development, implementation and planning

of national forest policies. National policies and strategies should provide a framework for developing and strengthening institutions and programmes for the management, conservation and sustainable development of forests and forest lands.

According to the Forest Principles, efforts should be made to promote a supportive international economic climate conducive to sustained and environmentally sound development of forests in all countries, which include, *inter alia*, the promotion of sustainable patterns of production and consumption, the eradication of poverty and the promotion of food security. Efforts should also be undertaken towards the greening of the world. All countries, notably developed countries, should take positive and transparent action towards reforestation, afforestation, and forest conservation. Efforts to maintain and increase forest cover and forest productivity should be undertaken in ecologically, economically and socially sound ways through the rehabilitation, reforestation and re-establishment of forests on unproductive, degraded and deforested lands, as well as through the management of existing forest resources.

The implementation of national policies and programmes aimed at forest management, conservation and sustainable development should be supported. Sustainable forest management and use should be carried out in accordance with national development policies and priorities and on the basis of environmentally sound guidelines. National forest policy formulation should take into account the pressures and demands imposed on forests from factors outside the forest sector, and intersectoral means to deal with these pressures should be sought. National forest policies should also include the protection of ecologically viable or unique forests, including old-growth forests, cultural, spiritual, historical, and religious forests.

Trade on forest products should be based on non-discriminatory and multilaterally agreed rules and procedures consistent with international trade law and practice. Reduction or removal of tariff barriers and impediments to the provision of better market access and better prices for higher value-added forest products and their local processing should be encouraged. Environmental costs and benefits should be incorporated into market forces and mechanisms, and forest conservation and sustainable development policies should be integrated with economic, trade and other relevant policies.

The UNCED process established a strong international background for the development of national forest policies. For example, in Finland the UNCED forest principles influenced the attitudes of forestry professionals and forest owners and alleviated potential opposition to new forest policies. The UNCED process also underpinned the resolutions of the Ministerial Conferences for the Protection of Forests in Europe, which have had a major impact on the formulation of European forest policies (Viitala 2003, p. 92).

3.2 Intergovernmental Panel on Forests (IPF)

The United Nations Commission on Sustainable Development (CSD) established the Intergovernmental Panel on Forests (IPF) in 1995. IPF was open to all nations and its purpose was to advance the enforcement of the decisions on forests made in the UNCED and to encourage open discussion on the forest principles developed at UNCED. The Panel was to make practical suggestions on the measures to promote sustainable forestry. The IPF and its successor IFF can be considered as the most important fora for international discussion on forest policy in the late 1990s.

The mandate of the IPF extended over a two year period (1995-97) and its programme of work involved issues grouped into five categories:

1. Implementation of forest-related decisions of the UNCED at the national and international levels, including an examination of sectoral and cross-sectoral linkages
2. International co-operation in financial assistance and technology transfer
3. Scientific research, forest assessment and the development of criteria and indicators for sustainable forest management
4. Trade and environment in relation to forest products and services
5. International organisations and multilateral institutions and instruments, including appropriate legal mechanisms (United Nations Sustainable Development 2001)

The outcome of the IPF was almost 150 negotiated proposals for action on a number of issues related to sustainable forest management. The proposals were directed at governments and organisations and they covered global issues such as deforestation, desertification and air-borne pollution as well as national forest programmes, forest conservation, indicators and criteria for sustainable forestry, and research and technology transfer (Pirkola and Kaipainen 2001, p. 14-15).

3.3 Intergovernmental Forum on Forests (IFF)

A Special Session of the UN General Assembly in 1997 recommended a continuation of the intergovernmental policy dialogue on forests after the IPF. The United Nations Economic and Social Council (ECOSOC) established the *ad hoc* open ended Intergovernmental Forum on Forests (IFF) in 1997. The mandate of the IFF comprised three categories:

Promoting and facilitating the implementation of the proposals for action of the IPF and reviewing, monitoring and reporting on progress in the management, conservation and sustainable development of all types of forest

Considering matters left pending and other issues arising from the programme elements of the IPF process

International arrangements and mechanisms to promote the management, conservation and sustainable development of all types of forests. (Pirkola and Kaipainen 2001, p. 15; United Nations Sustainable Development 2001)

The IFF had three sessions in 1998, 1999 and the last one in 2000. The IFF made several proposals for action which, combined with those from the IPF, brought the total to 248 proposals for action. They dealt with national forest programmes and their implementation, combating deforestation, enhancing the vitality and health of forests, defining the criteria and indicators of sustainable forestry, forest conservation and citizen participation in forest management and use (Pirkola and Kaipainen 2001, p. 16).

The purpose of the proposals was to strengthen the political commitment of member states to the sustainable use of forests, their management and conservation. The broad objective was that results should be monitored and evaluated more efficiently and that countries should commit themselves to international forest co-operation (Pirkola and Kaipainen 2001, p. 16).

3.4 National Forest Programmes

The IPF/IFF endorsed the concept of *National Forest Programmes (NFP)* as a tool for forest policy formulation. According to the Ministerial Conference (MCPFE) definition, a NFP constitutes a participatory, holistic, inter-sectoral and iterative

process of policy planning, implementation, monitoring and evaluation at the national and/or subnational level in order to proceed towards the further improvement of sustainable forest management (MCPFE 2002).

The National Forest Programmes refer to forests, forestry and the forestry sector in their broadest interpretation. They are based on a set of basic principles and engage a wide range of approaches to sustainable forest management in different countries. The preparation of a NFP is a national initiative for which each country must assume full leadership and responsibility. NFPs can appear in two modes: either as a technique for technocratic policymaking or an approach for active participation of stakeholders in the political process on the use of forests. In the participatory policymaking approach, the content of sustainable forest management is shaped and re-shaped by the discourse of the participants (Liss 1999, p. 62; Glück 1998, pp. 101-102; Glück and Voitleither 2000, p. 37).

NFPs can lead to a broadening of the social and cultural environment and impacts of forest policies. This can happen by NFPs changing the content of forest policies toward sustainable forest management and multifunctionality of forests, broadening the number of stakeholders and actors in the process, and changing the legitimacy of the stakeholders (Berge and Aasen 2000, p. 91).

There is some ambiguity in the concept of NFP. In many countries the words “programme” and “plan” are used interchangeably and “strategy”, “forest strategy” or “national strategy” may be used for a process similar to that of a NFP. Two main tendencies in the formulation of NFPs in Europe can be observed: 1) countries elaborating a NFP in the sense of a comprehensive policy planning process, even though a strategic forest policy framework already exists, and 2) countries taking their already existing strategic forest policy planning approach as covering the concept of a NFP. The majority of European countries have followed the first tendency (Schanz 2000, pp. 21, 29).

In order for the achievements of a NFP to be monitored and evaluated, the goal of the programme should be defined as accurately as possible, preferably in quantitative terms (Glück 1998, pp. 101-102). For instance, Finland has ongoing procedures for monitoring its National Forest Programme, and a mid-term evaluation of the programme has recently been carried out (Kivinen and Paldanius 2002). The monitoring and evaluation of NFPs will produce information that has so far been non-existent on the efficacy and efficiency of the planning processes.

3.5 United Nations Forum on Forests (UNFF)

Following a recommendation in the last session of the IFF, the United Nations Forum on Forests (UNFF) was established in 2000 under the United Nations Economic and Social Council (ECOSOC). UNFF is an intergovernmental organ that meets annually and the membership is not limited. There will be five official sessions of the UNFF, the last to be held in 2005. The heads of relevant organisations of the UN system and heads of other relevant international and regional organisations form a collaborative partnership on forests to support the work of the UNFF and to enhance co-ordination among participants. The collaborative partnership on forests (CPF) also builds on the experience of the Interagency Task Force on Forests (ITFF), which was established in 1995 and worked for six years to support the IPF and IFF (UN Collaborative Partnership on Forests 2001).

An underlying objective of the UNFF is to enhance the political commitment of nation states to the promotion of management, utilisation, conservation and sustainable development of all types of forests. The UNFF is a forum for countries to engage in discussions about forests and the development of forest policies. The main purpose of UNFF is to promote the implementation of internationally agreed

actions on forests and to enhance the co-operation and co-ordination between organisations, between developed and developing nations, across sector borders and between public and private entities (Pirkola and Kaipainen 2001, p. 18; United Nations Economic and Social Council 2000).

The UNFF has the following principal functions:

- to facilitate and promote the implementation of the IPF/IFF proposals for action and other actions which may be agreed upon, including national forest programmes
- to provide a forum for continued policy development and dialogue among governments, which would involve international organisations and other interested parties
- to enhance co-operation and policy and programme co-ordination on forest related issues among relevant organisations and institutions
- to foster international co-operation, including North-South and public-private partnership, and cross-sectoral co-operation at the national, regional and global levels
- to monitor and evaluate progress at the national, regional and global levels
- to strengthen political commitment to the management, conservation and sustainable development of all types of forests (UN Economic and Social Council 2000)

3.6 Ministerial Conferences on the Protection of Forests in Europe

The Ministerial Conferences on the Protection of Forests in Europe have had an important role in furthering the co-operation of European countries with respect to forests. The process consists of a string of political level conferences and mechanisms for their follow-up work. The signatory states and the European Community are responsible for the implementation of the decisions taken at the conferences. The discussions and the follow-up work between the conferences is called the "Pan-European Process". There were three Ministerial Conferences arranged in the 1990s. At the first Ministerial Conference in Strasbourg in 1990 a General Declaration and six resolutions concerning forest conservation were approved. (MCPFE 2000)

At the second Ministerial Conference in Helsinki in 1993 the participants defined the concepts and policies of sustainable forest management and protection of forests in Europe on the basis of the decisions on forests by the UNCED (Viitala 2003, p. 94). A General Declaration was adopted as well as four resolutions:

- H1: General Guidelines for the Sustainable Management of Forests in Europe
- H2: General Guidelines for the Conservation of the Biodiversity of European Forests
- H3: Forestry Co-operation with countries with Economies in Transition
- H4: Strategies for a process of Long-term Adaptation of Forests in Europe to Climate Change

The Convention on Biological Diversity, opened for signature at the UNCED in 1992, was adapted to apply to European forest ecosystems in resolution H2. The Helsinki Conference and related follow-up work have been significant in harmonising the principles of forest management and forestry practices and the contents of sustainable forestry in Europe. The focal achievements of the follow-up

work included the creation of European criteria and indicators for sustainable management of forests and the formulation of practical principles on how to utilise them. (Viitala 2003, p. 97)

The third Ministerial Conference in Lisbon in 1998 adopted a General Declaration and two resolutions. The resolutions were:

- L1: People, Forests and Forestry – Enhancement of the Socio-Economic Aspects of Sustainable Forest Management, and
- L2: Pan-European Criteria, Indicators and Operational Level Guidelines for Sustainable Forest Management

Resolution L1 emphasizes the interaction and companionship of society and the forest sector, participation of citizens in the planning of forest policy, the impact of the forest sector on rural development, improvement of employment and increasing sustainable use of wood and other forest products (Pirkola and Kaipainen 2001, p. 20-21).

The General Declaration strengthens the use of criteria and indicators as steering tools of forest policy and instruments in monitoring the state of the forests and sustainable forestry. Criteria and indicators should be included in national forest programmes and other planning systems and implementation of sustainable forestry should be monitored according to the agreed goals (Pirkola and Kaipainen 2001, p. 21).

The General Co-ordination Committee is responsible for the follow-up of the work of the Ministerial Conferences. There are two meetings annually: an expert level meeting and an informal round table meeting. The main issues in the follow-up meetings have been national forest programmes, the role of forests in rural development and criteria and indicators for sustainable development of forests. The fourth Ministerial Conference will be organized in Austria in 2003⁶.

3.7 International Environmental Agreements

3.7.1 Organisations operating in the Forest Sector

Before detailing recent international environmental agreements that affect forests, it is useful to list several important international organisations working in the global forest policy sector. These include:

- United Nations Food and Agriculture Organization (FAO)
- FAO European Forestry Commission
- Economic Commission for Europe (ECE)
- International Tropical Timber Organization (ITTO)

The main international forest research organisations include:

- International Union for Forest Research Organizations (IUFRO)
- European Forest Institute (EFI)

3.7.2 United Nations Framework Convention on Climate Change (UNFCCC)

Negotiations on the United Nations Framework Convention on Climate Change (UNFCCC) were launched in 1990 by the UN General Assembly. The Convention was adopted in 1992 and opened for signature at the UNCED in Rio. The Convention entered into force in 1994. The original Convention does not include precise, legally binding commitments for reduction and stabilization of greenhouse gas emissions.

⁶ <http://www.lu-vienna.at/livingforests/summit/>

Since the adoption of the Convention, negotiations of the parties have continued in order to agree on decisions and conclusions that will advance its implementation (Pirkola and Kaipainen 2001, pp. 23-24).

The legally binding Kyoto Protocol (1997) includes emission reduction targets for developed countries. Certain human-induced activities in the land-use, land-use change and forestry (LULUCF) sector that remove greenhouse gases from the atmosphere (carbon sinks), namely afforestation, reforestation and tackling deforestation, may be used to offset emission targets by the Parties (Article 3 of the Kyoto Protocol). A number of issues remained unresolved in the Kyoto Protocol and have been subject to continuous negotiations (as of June 2003 the Protocol had not yet been ratified). These issues include the elaboration of definitions for afforestation, reforestation and deforestation. The definitions of these concepts will determine how the carbon sinks of Article 3.3. will affect the emission targets of the different countries (Pirkola and Kaipainen 2001, p. 27).

3.7.3 The Convention on Biological Diversity (CBD)

The Convention on Biological Diversity (CBD) was signed at the UNCED in Rio 1992 and came into force in 1993. The CBD has three goals: 1) the conservation of biological diversity, 2) the sustainable use of the components of biological diversity, and 3) the fair and equitable sharing of benefits arising from the use of genetic resources. Biological diversity includes diversity within species, between species and ecosystems, and between various types of forest landscapes (Convention on Biological Diversity 2001; UN Commission on Sustainable Development 1998).

Each contracting party shall:

- develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity
- integrate the conservation and sustainable use of biological diversity into relevant sectoral or cross-sectoral plans, programmes and policies
- integrate consideration of conservation and sustainable use of biological resources into national decision making
- adopt measures relating to the use of biological resources to avoid or minimize adverse impacts on biological diversity
- protect and encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements
- support local populations to develop and implement remedial actions in degraded areas where biological diversity has been reduced
- encourage co-operation between governmental authorities and the private sector in developing methods for sustainable use of biological resources (Pirkola and Kaipainen 2001; Convention on Biological Diversity 2001)

Forests do not form an entity in the CBD. Forests are included in several parts of the Convention, such as indicators and criteria, agriculture and genetic resources. Biodiversity issues concerning forests have been discussed in the meetings of the CBD. Following the recommendation of the Scientific Body (SBSTTA) of CBD, a Work Programme for Forest Biological Diversity was approved in 1998. An *ad hoc* Technical Expert Group on Forest Biological Diversity (AHTEG) was established in 2000. The task of AHTEG is to follow-up the Work Programme during 1998-2007. In the first stage of the Programme the issues of how to increase biodiversity conservation in forestry and how forest management measures affect forest

biodiversity will be addressed. Indicators for sustainable forestry will be developed to account better for the different aspects of biodiversity (Pirkola and Kaipainen 2001, pp. 30-31).

3.7.4 The United Nations Convention to Combat Desertification (UNCCD)

The United Nations Convention to Combat Desertification (UNCCD) was adopted in 1994 and came into force in 1996. The UNCCD aims at combating desertification, mitigating the effects of drought and contributing to the achievement of sustainable development. This involves long-term strategies focusing on improved productivity of the land and rehabilitation, conservation and sustainable management of land and water resources, leading to improved living conditions (UN Commission on Sustainable Development 1998).

In the UNCCD, desertification is defined as the decreased productivity of the land in arid and semi-arid climate zones. The causes for decreased productivity are listed as the direct impacts of human actions as well as indirect impacts such as climate change.

The UNCCD adopted an integrated approach which addresses the physical, biological and socio-economic processes of desertification and drought. The Convention recognizes that combating desertification is not a narrow sectoral activity but requires a broad approach, incorporating most aspects of environmental management in the drylands (UN Commission on Sustainable Development 1998).

In Europe the UNCCD applies to the arid areas of the Mediterranean region and Central and Eastern Europe. In 2000, at a meeting in Bonn, a new regional implementation annex for Central and Eastern European countries was approved.

The UNCCD aims to protect forests because forests perform important ecological functions that prevent desertification and arid conditions. By afforestation the spreading of deserts can be slowed down and the productivity of the land can be maintained. Forests also provide different services to the local people (Pirkola and Kaipainen 2001, p. 36-37).

3.7.5 The International Tropical Timber Agreement (ITTA)

The International Tropical Timber Agreement (ITTA) was adopted in 1994 and came into force in 1997. It succeeds the earlier 1983 ITTA. This was a commodity agreement to facilitate the trade in tropical timber, and to ensure that exports are from sustainable sources by the year 2000.

4

Forest policy in the European Union

The Treaties of the European Union make no provision for a comprehensive common forest policy. Following the subsidiarity principle, forestry has always been under the responsibility of the member states. The main argument for this has been that the forest sector has traditionally worked well within the market economy and policies bringing regulation and support mechanisms have not been seen as necessary. Forestry conditions and practices also vary widely in the member countries, and it would be a difficult task to create a common forest policy adaptable and acceptable in all parts of Europe. In general, the view of the Nordic countries have been that control over forests should be left to the Member States, whereas the southern European countries have been in favour of a more interventionist common forest policy. However, the management, conservation and sustainable development of forests are important issues in the common EU policies concerning e.g. agriculture, rural development, environment, industry, development cooperation and the energy sector. In the agricultural and environmental policies, in particular, there are several regulations and directives which have direct or indirect impacts on the forest sector (Ottisch and Palachi 2001, pp. 440-441; Hyttinen and Flies 1999, p. 39; FERN Briefing note 1998).

4.1 Forest strategy for the EU

In 1998 a forest strategy was prepared for the EU, which consists of two parts: Communication from the Commission on a Forestry Strategy for the EU and the Council resolution on a forestry strategy for the EU.

The Communication of the Commission describes the present state of forestry in the EU and the measures taken in forestry. The strategy is based on the multi-functional nature of forests and places particular emphasis on the major challenges facing European forestry, such as its contribution to overall economic and social development, especially in rural areas, and the protection of the environment, notably in relation to biodiversity and climate change (Ministry of Agriculture and Forestry 2001, European Commission 1998).

Threats to European forests identified in the strategy are:

- deforestation as a result of urban and industrial uses and the creation of large-scale infrastructures
- air pollution
- fires
- climate change
- attacks from parasites and diseases

The multi-functionality of forests is stressed. Apart from the raw-material function of forests, forests offer many other benefits useful to society, which are highly valued. These are the recreational use of forests, environmental aspects associated with forests' protective functions, like biodiversity, local and regional climates, and water

and soil protection. Avalanche control and protection against erosion in the mountain areas is important. The role of forests in the fixation of carbon dioxide has grown in importance (European Commission 1998).

The key issues in the strategy in relation to forestry are:

- the promotion of the development of the forestry sector as a contribution to rural development and employment in rural areas
- the protection of natural environment and forest heritage and restoration of damaged forests
- the maintenance of the social and recreational functions of forests
- the improvement of ecologically, economically and socially sustainable forest management within the framework of the internal market, and in line with the Union's international obligations, including World Trade Organization (WTO)- compatible trade rules
- avoidance of forest destruction in other parts of the world
- protection of forests against deforestation, forest fires and atmospheric pollution and the fulfilment of the targets of the 5th Environmental Action Programme
- the promotion of the role of forests as carbon trapping mechanisms and wood products as carbon sinks
- promoting environmental virtues of wood and other forest products
- assuring the competitiveness of the EU forest-based industries (European Commission 1998)

The EU forest strategy emphasizes that, in line with the principle of subsidiarity, the member states are responsible for planning and implementing national forest programmes of equivalent instruments. National forestry programmes have been launched in Austria, Finland, Germany, Spain and Switzerland and Forestry Plans similar to national forestry programmes in Norway, Portugal and the UK (Hytinen and Flies 1999, p. 40; UN/ECE 2001).

4.2 Policy context for forestry regulation

The common agricultural policy (CAP) and regional policy of the EU are described here as forest and forestry-related regulations and programmes are primarily dealt with within these two policy areas.

4.2.1 The CAP reform

The European Council in Berlin (1999) reaffirmed the content of the Common Agricultural Policy (CAP) reform and gave concrete shape to a European model of agriculture in the years to come. The reform should secure a multi-functional, sustainable and competitive agriculture throughout Europe. It should also maintain the landscape and the countryside, make a key contribution to the vitality of rural communities, and meet the demands for food quality and safety, animal welfare standards and environmental protection. The aim of the CAP reform is to deepen and widen the earlier (1992) reform by replacing price support measures with direct aid payments and accompanying this process by a consistent rural policy (European Union 2002).

The European Council confirmed the following guidelines for the CAP reform:

- Continued competitiveness should be ensured by sufficiently large price cuts. Price reductions are offset by direct aid to safeguard income levels
- A new division of functions between the Commission and the member states aiming at decentralisation
- A major effort to simplify the rules, such as the new Development Regulation, which does away with a number of regulations. Legislation should be clearer, more transparent and easier to access.
- Rural development becomes the second pillar of CAP (European Union 2002).

In June 2003, the EU agricultural ministers adopted a reform of the CAP which will change the way the EU supports its farm sector. The vast majority of farm subsidies will be paid independently from the volume of production. New “single farm payments” may be adopted that maintain a limited link between subsidy and production. These payments will be linked to the respect of environmental, food safety, animal and plant health, and animal welfare standards. (CAP reform 2003)

4.2.2 Structural policy reform

The objectives of the Structural policy reform (1999) were:

- to reduce disparities in development and promote economic and social cohesion in the European Union
- to improve the effectiveness of the Community’s structural assistance by concentrating the assistance more and simplifying its operation by reducing the number of Objectives.

Council Regulation (EC) No 1260/1999 lays down general provisions of the Structural Funds and it has been amended by Council Regulation (EC) No 1447/2001.

The 1999 reform has increased the concentration of assistance but has also moved towards the simplification and decentralisation of its management. The reform introduces a clearer division of responsibilities and stricter application of subsidiarity.

Concentration has been increased by reducing the number of Objectives from seven to three:

- Objective 1 promotes the development and structural adjustment of regions whose development is lagging behind.
- Objective 2 contributes to the economic and social conversion of regions in structural difficulties
- Objective 3 has all the measures for human resource development.

The new Regulations reduce the number of Community Initiatives from 13 to 4. The new Initiatives are:

- INTERREG III, which aims to stimulate cross-border, transnational and inter-regional co-operation
- LEADER, which promotes rural development through the initiatives of local action groups
- EQUAL, which deals with discrimination and inequality in the labour market
- URBAN, which encourages the economic and social regeneration of urban areas in crisis.

4.2.3 Structural funds

Four types of Structural Funds have been introduced over the years, two of which are relevant to forests:

- the European Regional Development Fund (ERDF)
- the European Agricultural Guidance and Guarantee Fund (EAGGF)

Council Regulation (EC) No 1260/1999 lays down general provisions of the Structural Funds for the period 2000 to 2006. Alongside the Structural Funds, a Cohesion Fund has existed since 1993. It finances transport and environment infrastructure in the member states whose GDP per capita is less than 90% of the Union average (Greece, Ireland, Spain and Portugal).

The ERDF is intended to reduce regional imbalances in the Community. The Fund grants assistance for the development of less-favoured regions. It contributes to Objectives 1 and 2 and to the INTERREG and Urban Community Initiatives.

The EAGGF is divided into two sections:

- the Guarantee Section funds expenditure arising from the common organisation of the market and agricultural prices, rural development measures accompanying market support and rural measures outside Objective 1 regions
- the Guidance Section funds other rural development expenditure not funded by the Guarantee Section 4.3.

4.2.4 Forestry measures and forest-related regulations of the EU

As regards agriculture and forestry, specific provisions are laid down in three other regulations. The legal basis for the rural development policy is provided by the Council Regulation (EC) No 1257/1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF), the Commission Regulation (EC) No 1750/1999, laying down detailed rules for the application for the Regulation support for rural development, and the Commission Regulation (EC) No 2603/1999, which lays down rules for the transition to the rural development support provided by the Council Regulation No 1257/1999 (Buck 2000; du Breil de Pontebriad 2000).

Regulation 1257/1999 brings together previously isolated measures in Council regulations such as 1610/89 (scheme to develop and optimally utilise woodlands in rural areas in the Community), 2080/92 (aid scheme for forestry measures in agriculture) and 867/90 (improvement of processing and marketing conditions for forestry products). Forestry measures are grouped in one chapter (VIII), consisting of four articles:

- Article 29 specifies the objectives and beneficiaries of the forestry measures
- Article 30 describes the different eligible measures
- Article 31 lays down the provisions as regards the afforestation of agricultural land
- Article 32 introduces a new measure that allows for providing aid to forests with a prominent protective and ecological role (du Breil de Pontebriad 2000).

Regulation 1750/1999 has one section (8) in Chapter II for forestry where several provisions of regulation 1257/1999 are clarified or complemented.

The previous and the new regulations for forestry measures have some differences. Regulation 1257/1999 modifies both the financing and programming rules. All forestry measures under regulation 2080/92 were financed by the Guarantee Section of the EAGGF and were presented by the member states in autonomous programmes.

Public authorities under regulation 1257/1999 are now excluded from afforestation aid. Except for a premium to cover loss of income and for some maintenance measures, no maximum amount is fixed in the regulation. Investments for the improvement of woodlands are no longer limited to farmers and their associations. More initiative is given to member states in the operation of forestry measures. It is up to the countries to decide to support the afforestation of agricultural land, whereas the implementation of the scheme was previously mandatory. The control and evaluation of the measures has also gained in importance (du Breil de Pontebriad 2000, p. 33-35).

Measures accompanying the previous CAP reform (*Council Regulation (EEC) No 2080/92*) promoted afforestation as an alternative use for agricultural land and the development of forestry activities on farms in order to:

- accompany the changes to be introduced under the market organization rules
- contribute towards an eventual improvement in forest resources
- contribute towards forms of countryside management more compatible with environmental balance
- combat the greenhouse effect and absorb carbon dioxide.

Excluding the figures of Belgium and Sweden (where the programme was only initiated in 1996) a total of 519 350 ha of agricultural land had been afforested under the Regulation in 1993-1997 (Figure 1). Spain alone accounts for 46% of this additional wooded area, followed by the United Kingdom, Ireland and Portugal, which afforested over 50 000 ha of agricultural land during this period.

The decrease in utilised agricultural area (UAA) resulting from afforestation in most member countries has been marginal. The highest relative decrease was in Ireland (1.35%). The main percentage increase in forest area ensuing from afforestation occurred in Ireland (12%); it was just above 2% in the UK and less than 2% in the other countries (Figure 2 – Hyttinen and Flies 1999; Sontag 2001; European Commission 1997; du Breil de Pontbriand 2000).

According to the cumulative situation by April 1999 in the implementation of the programmes, the total area of afforestation was 899 860 ha and total area under the premium for maintenance of woodland was 662 400 ha (du Breil de Pontebriad 2000, p. 36).

Other forestry measures falling under common policies of the EU included the scheme to develop and optimally utilise woodlands in rural areas (*Council Regulation (EEC) No 1610/89*), which had a wide range of forestry measures to promote the economic, ecological and social functions of forests. Priority was given to regional programmes in areas where silvicultural measures may improve the local economy, where watershed management, soil conservation and erosion control are important or where social and recreational function of the woodland is significant.

The development of the forestry sector by improving the processing and marketing conditions for forestry products (*Council Regulation (EEC) No 867/89*) provided for support in the framework of objective 5a for forestry operations upstream of industrial processing. The operations concerned were, for example, felling, stripping, cutting up, storage, protective treatment and drying.

The protection of forests against atmospheric pollution measure (*Council Regulation (EEC) No 3528/86*) established a uniform periodic inventory of forest damages. The inventory provides information on the extent and development of forest deterioration in the regions of the EU.

Prevention of forest fires measures (*Council Regulation (EEC) No 2158/92*) are part-financed by the Union within the framework of the rural development policy and through the specific Community action to protect forests against fires.

The European forestry information and communication system (EFICS) (*Council Regulation (EEC) No 1615/89*) aims at improving the quality of information on forest resources and their utilisation.

All forest and forestry measures have to be compatible with the EU international trade obligations and subject to any other commitments to which the EU is signatory. Also any fiscal measures and public aid granted to forestry by member states must be compatible with the rules of the common market and must be notified to the Commission. All fiscal measures must respect market-based discipline and ensure the effective functioning of competition policy.

Community support for forestry research is provided within the Fifth Framework Programme for research, technological development and demonstration activities (RTD), 1998-2002. Forestry research is incorporated within the concept of Key Actions, major research support carriers, under which multidisciplinary and integrated research efforts are focused upon problems of major socio-economic importance. Forestry issues are included in Key Actions under two Specific Programmes: "Quality of life and management of living resources" and "Preserving the ecosystem". The Sixth Framework Programme (2003 –) also includes forestry research under the research theme "Sustainable development, global change and ecosystems".

The Standing Forestry Committee (*Decision 89/367/EEC*) is a committee under DG Agriculture. Its meetings are attended by government officials of the member states. There are also Advisory Committees on Forestry and Cork and on Community Policy Regarding Forestry and Forest-based Industries.

4.2.5 The EU role in development co-operation outside Europe

The overall goal of the Community forest development co-operation is to promote sustainable forest management in developing countries as a contribution to sustainable development globally. The concept covers a whole range of environmental, economic and social benefits of forests. The general objective of EU co-operation for forestry development is to maintain adequate forest cover and improve forest management in developing countries as a contribution to the local, regional and global environment and overall sustainable development. The following forestry sector objectives, to be achieved via EU development aid programmes, can be identified:

- reducing uncontrolled deforestation and forest degradation
- increasing the areas under sustainable forest management
- increasing the revenue from forest products and make its distribution more equitable
- maintaining genetic resources and biodiversity
- developing research to improve forest-related knowledge

The EU is one of the parties in several international forest conventions and agreements. The member states act primarily through the EU to forward their goals by striving to present a common position on forest issues. Prior to international forest conventions, co-ordination meetings are held among the EU states, where views are discussed and agreed and addresses are prepared (Pirkola and Kaipainen 2001, p. 51).

4.3 The EU Rural Development Policy

With the reform of the common agricultural policy (CAP), the importance of rural development policy has been recognised in the development of the European rural areas and agricultural sector. The foundation for a comprehensive and consistent rural development policy has been laid, recognizing the importance of a balanced development of rural areas alongside market measures and the requirement for the competitiveness of European agriculture (Buck 2000, p. 29; European Union 2002).

The rural development policy is based on the following principles:

- the multi-functionality of agriculture
- a multi-sectoral and integrated approach to the rural economy in order to diversify activities and to protect the rural heritage
- flexible aids for rural development, based on subsidiarity and promoting decentralisation
- transparency in drawing up and managing programmes

The policy aims at development, which:

- strengthens the agricultural and forestry sector
- improves the competitiveness of rural areas
- preserves the environment and rural heritage

The rural development policy should improve integration between different types of intervention and encourage smooth and balanced development in rural areas of Europe (Buck 2000, p. 29).

In the rural development policy support for forestry is available for woodland owned by individuals, associations or local authorities. It covers the following measures:

- investments in forests to improve their economic, ecological or social value
- investments designed to improve and rationalise the production, processing and marketing of forestry products
- investments related to the use of wood as a raw material
- promotion of new outlets for processing and marketing forestry products
- creation of foresters' associations aimed at helping their members to improve forest management
- restoring the potential of forest production following damage by natural disasters and fire and introducing appropriate preventive measures
- maintaining and improving the ecological stability of forests in areas which act to protect the public interest, and maintenance of firebreaks through agricultural measures

4.4 Environmental policies of the EU

The principle of sustainable development is one of the EU's aims and a high degree of environmental protection one of its absolute priorities. The Fifth Community Action Programme on the Environment "Towards Sustainability" established the principles of a European Strategy of voluntary action for the period 1992-2000 to achieve these ends. The Communication from the Commission (European Commission 1998) on integrating the environment into European Union policies obliged the Community institutions to take account of environmental considerations in all their other policies.

A communication on the *European strategy for sustainable development* was approved in 2001. It sets out the long-term objectives for sustainable development and concerns climate change, transport, health and natural resources.

The *sixth action programme for the environment* sets out the priorities for the European Community up to 2010. Four areas are central: climate change, nature and biodiversity, environment and health, and the management of natural resources and waste. Measures to achieve these priorities are:

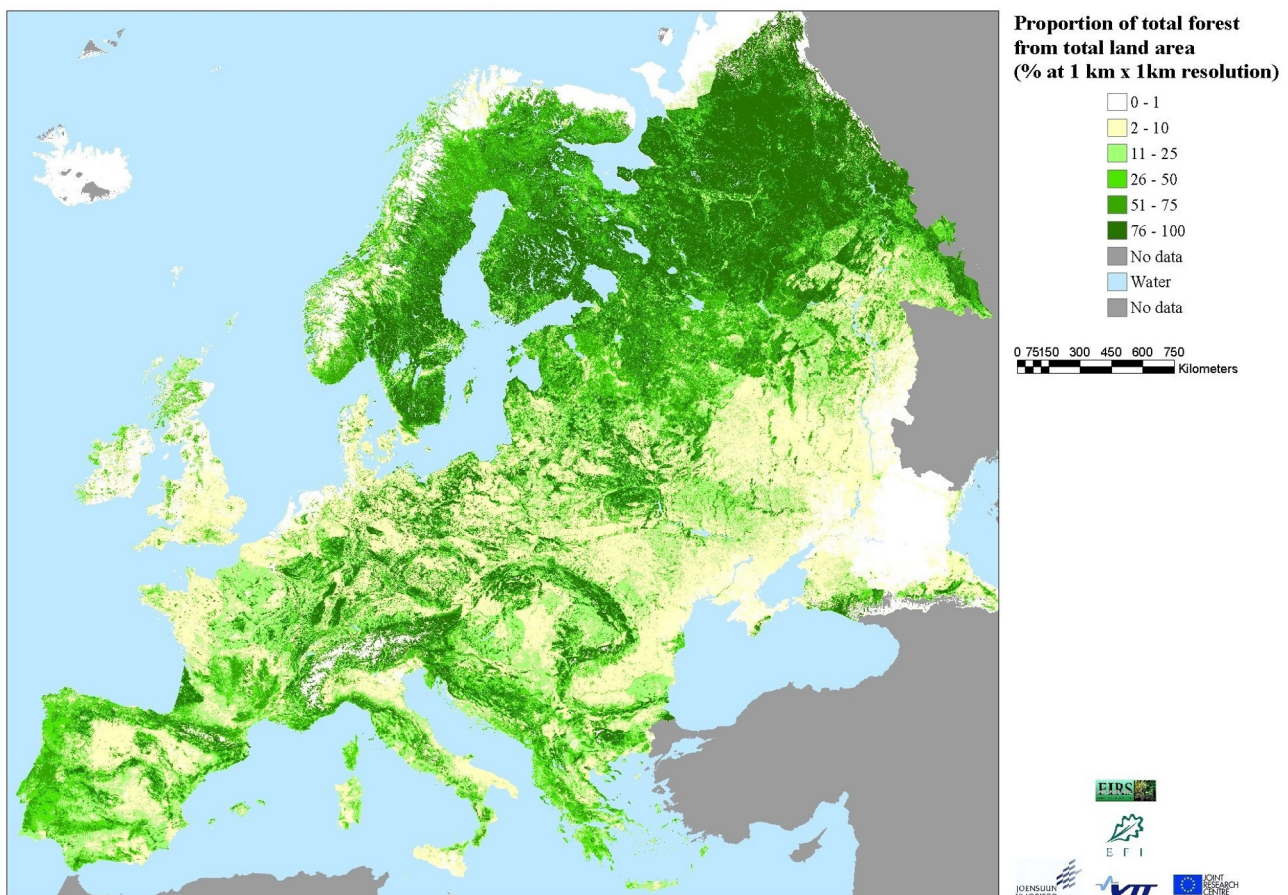
- improving the application of environmental legislation
- working together with the market and citizens ensuring that other Community policies take greater account of environmental considerations.

The objective of the European ecological network *Natura 2000* is to maintain biodiversity by conserving natural habitats and wild flora and fauna in the European territory of the member states. The network comprises special areas of conservation designated by member states in accordance with the provisions of the Directive (92/43/EEC) and special protection areas.

5

National Forest Policies in Europe

The area of forest in Europe, which accounts for about 5% of the world total, is very diverse, not only in terms of its ecology and productivity, but also in its history, ownership and management. There are great differences in forest cover between countries. In the Netherlands, forests and other wooded land cover around 10% of the land area, whereas in Sweden and Finland the forests cover 68% and 77% respectively of the land area. European forests also vary widely ecologically and their productivity and growth conditions are different in different parts of the continent. Management regimes and the uses of forests also vary greatly between the countries (UNECE/FAO 1996). In spite of this great diversity, recent trends in forest policies in most European countries have been fairly similar. European forestry seems to have undergone a paradigm shift, which has resulted in revisions or reforms of forest laws and policies. In the following sections the national forest policies of 16 European countries are presented. A summary of these policies is presented in Table 2.



Percentage forest cover in Europe by 1 km pixel. Source: Schuck et al. (2002); Päivinen et al. (2001)⁷

⁷ This information is based on outputs from the project "Forest tree groupings database of the EU-15 and pan-European area derived from NOAA_AVHRR data", which was awarded by the European Commission, Joint Research Centre (Institute for Environment and Sustainability), to a consortium consisting of EFI, VTT Information Technology and the University of Joensuu under the contract number: I7223-2000-12 FISISPFI. The information contained herein has been obtained from or is based upon sources believed by the authors to be reliable but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon does so entirely at his/her own risk. The European Commission not the project consortium are responsible for its use in this publication and the content is at the sole responsibility of the end-user.

Table 2. Forest policies in Europe

Country	Forest legislation	National Forest Programme	Main forest policy goals	Administration
Austria	1975	NFP	In line with EU forest strategy, MCPFE wood production	Centralised, a contact platform established
Belgium	Flanders reformed in 1990, 1997 Wallonia 1854 code and decrees 1994, 1995	Flanders NFP Wallonia a policy document	Sustainable forest management, UNCED and MCPFE principles	Decentralised
Denmark	Reformed in 1996	NFP	Sustainable forest management, multi-functionality	Centralised
Finland	Reformed in 1997	NFP	Sustainable forest management, multi-functionality UNCED and MCPFE principles, wood production	Centralised, participation in policy formulation increased
France	Reform of the forest law 1998	–	Sustainable forest management and multi-functionality as principles	Centralised
Germany	1975; 1992-94 New Forest Acts in 5 States of the former DDR	NFP	Sustainable forest management, wood production	Decentralised
Greece	The Constitution	Six-year development programmes	Protection of forests, changes in land use prohibited	Centralised
Ireland	1946, 1956, 1988	Strategic plan for development of forestry sector	Sustainable forestry, economic and social well-being, MCPFE principles	Centralised
Italy	1923 1985 Landscape Act	–	Regional policies, no nation wide policy objectives	Decentralised
The Netherlands	1922	Forest Policy Plan	Preservation of forest area, expansion of forest area, multi-functionality	Centralised
Norway	Forest Law 1994; revision 1998	White paper on forest policy	Sustainable use of forests, wood production, multi-functionality	Centralised
Portugal	Forest Law 1996; reformed 1999	Plan for the sustainable management of forests	Multi-functionality, sustainable forest management	Centralised, partnership and support to private forestry established
Spain	1957	NFP	Sustainable forest management	Decentralised
Sweden	Reformed 1994	Forest policy evaluated every 4 years	Sustainable forest management, wood production, multifunctionality	Centralised
Switzerland	Reformed 1993	Under preparation	Forest protection and conservation, land use changes prohibited, multifunctionality	Centralised
United Kingdom	1967, 1979	UK Sustainable Forestry Programme	Sustainable forest management, multifunctionality	Decentralised

5.1 Austria

5.1.1 Current situation

60% of the land area of Austria lies in the Alps. Forests cover 47% of the land area and are a dominant feature of the landscape. Of the total territory, 33% is agricultural land, 11% alpine meadows or unproductive areas, 7% developed areas or settlements and infrastructure, and 2% water. The main source of income in the country is tourism.

The Austrian Forest Act 1975 defines forest as land covered by forest tree species and exceeding 1000 m² with a minimum width of 10 m. Austria is, after Finland and Sweden, the 3rd most densely wooded country in the EU. There are approximately

0.5 ha of forest per capita. Over the past years the forest area has increased on average 2000 ha/year (Czamutian 1999, p. 4; Pregernig 1999, p. 15).

The growing stock of exploitable forests is almost 295 m³ standing timber/ha and the annual increment is 27.3 mill. m³ or 8.2 m³/ha. As only 19.5 mill m³ are felled each year, 29% of the increment remains in the forest annually. 86% of Austrian forests can be classified as commercial forests and 14% are forests without yield (Czamutian 1999, p. 5; Pregernig 1999, p. 15).

Austrian forests have economic importance for timber production, but perform a number of other functions as well, such as protection and recreational functions. 25% of the forests can be considered as natural or nearly natural. 41% have been moderately changed compared to the optimal natural state. The share of renewable fuels amounts to 12% of the total domestic supply; renewable fuels rank second after hydroelectric power (14.3% of the total domestic supply of fuels) (Steinlegger 2000; Natural resources 1999; European Commission 2000; Web Pages on Austrian Forestry 2001).

Austrian forests are primarily privately owned: about 80% of the forests are private forests and about half of the forest area is managed according to small-scale structure. Of the entire forest area, about one-third is owned by the major forest enterprises. 20% are public forests of which three-quarters are in the hands of the Federal Austrian Forests and the rest are provincial and communal forests. The forest property is highly fragmented: 99% of silviculturists manage enterprises of less than 200 ha and 56% of the forest properties are less than 5 ha. Access to forests is free for walking for recreational purposes. People are allowed to pick defined amounts of mushrooms and berries (Czamutian 1999, p. 4; Pregernig 1999, p. 15).

5.1.2 Forest policy

Austria is a federal state with 9 federal provinces. The forest administration is organised into three levels: the federal, the provincial and the district levels. The Federal Ministry of Agriculture, Forestry, Environment and Water Management is primarily responsible for the forestry sector (Czamutian 1999, p. 13).

Forest law is the responsibility of the federal government. The forest law covers all forestry activities. Other legal sectors of relevance to forests, such as hunting, regional planning or protection of nature, are within the competence of the federal provinces.

The Forest Act of 1975 (amended in 1987 and 1993) has its roots in the medieval regulations with a focus on sustainable forest utilisation for industry's needs. The Forest Act grants clear priority to the production of timber. The Act also contains the modern concept of forest functions, three of which relate to non-timber services of forests: protection against natural forces, welfare in terms of favourable impacts on the environment and recreation (Czamutian 1999, pp. 14-15; Pregernig 1999, p. 16). The law is rather detailed and prescribes three types of management plans, regulates exploitation and protection against fires, pests and air pollution, and has provision on subsidies for forestry activities (Cirelli and Schmithusen 2000; Federal Ministry of Agriculture and Forestry 2000; EFC Country national reports 2000).

The primacy of timber production has strongly influenced many aspects of Austrian forest policy. With a high share of forests in private ownership, the goals and interests of private forest owners determine forest policy. Forest interest groups are granted institutionalised influence on policy formulation and implementation (Pregernig 1999, p. 16). The Austrian Forest Strategy's key issues are the maintenance and improvement of the vitality and stability of forests, in particular the protective function of forests in mountainous areas. A further issue is the conservation of biological stability by promoting small scale, nature-emulating forest management

practices as well as establishment of protected areas. Austria has also carried out several national forestry programmes for the improvement of sustainable forest management and enhancement of biodiversity following the Helsinki Resolutions (Ministerial Conferences for the Protection of Forests in Europe, MCPFE) and the Rio Forest Principles. In addition, Austria hosts the Liaison Unit of the MCPFE. (Web Pages on Austrian Forestry 2001; Natural resources 1999).

Forest policy tools include regulation, subsidies and information. Regulatory instruments include: general prohibition to clear forests for other uses, obligation to reforest after harvesting, regulations on forest management practices that ensure sustainability, protection of forests and watershed management (Czamutian 1999, pp. 15).

There are subsidies for forest treatments and technical investments, high-elevation afforestation and amelioration of protection forests, watershed management projects, and biological and technical measures for torrent and avalanche control (Czamutian 1999, p. 16).

The intention of the Austrian government is to raise the tree line by means of new plantations at higher altitudes. The Austrian Forest Development Plan is a tool for planning reforestation. The areas designated for reforestation are marked as promising forest areas. Planting of new recreational and welfare forests in sparsely wooded suburban areas is also a major task. Forest Development Plans have been published since 1991. The objectives of the Plan are:

- to act as a framework plan for forests
- to describe forest conditions throughout Austria
- to define the forests' main roles
- to contribute to the sustainable and best possible preservation of forest's ability to fulfil all its roles

The entire Austrian forest is divided into individual planning areas, most of which correspond to political districts. Forest authority experts demarcate functional areas (minimum 10 ha) based on forest legislation criteria, and allocate a main role to them, plotting the areas on a 1:50 000 scale map of Austria. The map shows four main forest functions: utility, protection, welfare and recreation (Natural resources 1999; Web Pages on Austrian Forestry 2001; Geographical information...2001)

The main conflicts and challenges concerning forestry and forests in Austria are relations between different actors in the field of forestry, changing forestry practices, restoration of protection forests and timber certification. Hunting and artificially high game populations cause damage to forests in the form of bark stripping and browsing of regeneration areas. Forests are increasingly used for tourism and by local populations for recreational purposes. New sports, such as mountain biking, and the use of forest roads for tourism and recreation purposes also cause conflicts (Czamutian 1999)

Silvicultural practices are changing in Austria. Natural regeneration and the promotion of mixed stands is replacing artificial monocultural practices. A more natural approach to harvesting methods is adopted where possible. Small scale and naturalistic forest management has been promoted by the forestry authorities and this has led to a decrease in the proportion of non-deciduous tree species and pure forests. The restoration of protection forests is a challenge. Part of the protection and protected forests in the mountains are abandoned, unstocked, and many stands are overmature and lack regeneration (Czamutian 1999, pp. 18-19).

5.1.3 Protected forests

Approximately 755 000 ha or 19.3% of the forest area is classified as protected forests in Austria. Austrian forest legislation does not define protected forests as classified protection areas for nature conservation. Protected forests include all forest stocks on soils that would be eroded by wind or water without forest cover. Also sites where reforestation is difficult or impossible because of the conditions are included under the definition. Part of the protected forests can be used for commercial purposes (7.3% of the total forest area) provided that the protective function is accounted for. The purpose of forest protection is to maintain the beneficial effects of forests to humans, such as protective, social and recreational functions (Frank and Koch 1999). Strictly protected forest reserves cover 8062 ha, which is 0.2% of the total forest cover (Parviainen et al. 2000).

A Protective Forest Restoration Framework has been developed in Austria with the following measures:

- continuation and strengthening of clean air policies
- restoration of a balanced stock of wild game
- separation of forests and pasture in ecologically sensitive protected and mountain forest regions

Austria is establishing a network of natural forest reserves on the base of voluntary management agreements in force since 1995. The network aims at covering systematically all representative types of forest ecosystems in the country. The forests in the network are left untended for the purpose of preserving biological diversity and permitting research and education and a close relation to nature. Forest reserves have previously been established mainly in the Northern and Southern Calcareous Alps, the Alps proper and at the Eastern Rim of the Alps. By the end of 2000, 172 natural forest reserves had been established covering an area of 8082 ha. Most are small (5 to 20 ha) and the long-term aim is to establish as large an area of reserves as possible (Gschwandtl and Walkner 2000; Frank and Koch 1999; Web Pages on Austrian Forestry 2001; Austrian Forest Reserves Programme 2002).

5.2 Belgium

5.2.1 Current situation

Belgium is an urbanised society; 97% of the population live in urban areas and only 3% in rural areas. The total population is estimated to increase by 0.09% during 2000-2005 with the urban population increasing by 0.15% and the rural population decreasing by 2.25% (United Nations 2000).

Forests and other wooded land cover 672 000 ha or 22% of the total land area. The forest area per capita is 0.1 ha. The most forested area of the country is the Ardennes upland region in the southeast, where almost half of the forest is situated. In Wallonia, forest covers 30% of the total area (500 300 ha) and the forest area/capita is 0.15 ha. In Flanders, forest area is 8.5% of total land area or 114 200 ha and forest area per capita is 0.020 ha (Luyssaert 1999; FAO Forestry 2002; Natural resources 1999; FINE 2002).

There is not a single definition of forest for Belgium as a whole. Forests in general are considered to be surfaces covered with trees which function as ecosystems and can fulfil several functions such as wood production, recreation, nature conservation, landscape, soil and water protection and shelter (Natural resources 1999).

The forests in Wallonia do not suffer significantly from deforestation. During the past 150 years the region's forest area has increased from 300 000 ha to about 500 000 ha. Between 1984 and 1996, partly due to strong winds in 1996, the total forested area of Wallonia decreased by 10 000 ha. The total forest area in Belgium decreased slightly by 1000 ha or 0.2% in 1990-2000. The main causes of deforestation include: pressure from other land uses such as housing and infrastructure building, high fragmentation of the existing forest properties, low profitability of forests and abundance of game (FAO Forestry 2002; Natural resources 999; Luyssaert 1999)

In Wallonia productive forests cover 90% of the forested area.. The annual increment is 7.5 m³/ha or 4.6 mill m³. The cuttings and the increment are in balance (Luyssaert et al. 1999, p. 33-34). In Flanders the annual timber production is approximately 650 000 m³, the total annual growth is estimated at 862 5000 m³. Only 30% of the wood used by the Belgian wood industries is actually grown in Belgium, and the contribution of forestry to Belgian GNP is 0.11% (Luyssaert et al 1999, pp. 35-36).

In Belgium 57% of the forests are in private ownership and 34% are public. The Belgian forests are extremely fragmented; a great many of the private owners possess 5 ha or less. In Wallonia the average forest area/owner is 3 ha – 12.2% of the forests are state forests, 37.3% communal forests and 45.6% are strictly private forests. In Flanders, 70% of the fragments are less than 10 ha and 14% less than 1 ha. 68% of the forests are private, 12% are state-owned and 12.7% are communal forests. All public forests are under the management of regional forest services (Luyssaert et al. 1999, pp. 31-32).

5.2.2 Forest policy

Belgium has evolved via institutional reforms into a federal structure. Belgium has three Communities based on language and three Regions: Flanders, the Brussels capital region and the Walloon region. The forest service in Belgium is decentralized and the Regional Governments are responsible for forest policy and managing forests. Forestry is not incorporated in the agricultural administration, which is a federal matter in Belgium (Luyssaert et al. 1999).

Flanders region

The Belgian Forest Act of 1854 was replaced by the Flemish Government Act on Forests in 1990. The Act recognises several forest functions (economic, social, educational, shelter, ecological and scientific) and stresses the multifunctionality of forests. Forest owners are expected to have forest management plans. If a forest owner does not manage his forests according to the plan, he can be prosecuted. To overcome the problem of forest fragmentation, the forest authorities have promoted forest groupings with common management plans. Transformation of forest land into other uses is prohibited by the Forest decree (Natural resources 1999).

The Forest Act was amended in 1997 by the new Flemish Decree on Nature Conservation and the Natural Environment. There are now stronger limitations on deforestation. There is a strong emphasis on multiple use with an accent on conservation in the Flemish forest policy. Importance is given to wood production, but other forest functions are emphasised as well. Forestry and forests are seen as part of nature, a place for recreation and source of additional income. The goals of the Forest Act are to promote the opening up of woodlands for recreation and educational purposes, to designate certain areas for protection, to operate a conservative form of yield control, to favour silvicultural methods which are close to nature, and to promote management practices according to the designated aims

on private lands. Afforestation of abandoned agricultural lands has been carried out within the EU ordinances for forestry (2080/92 and 1257/99) – in 1997 175 ha of forests were planted within the regulation 2080/92 in Flanders (Luyssaert et al. 1999, pp. 38-39; Natural resources 1999).

Forest owners in Flanders have to pay special attention to the ecological forest function. Forest management must comply with principles of conserving or restoring the natural flora and fauna, promoting indigenous or site-adapted species, natural vegetation, and uneven-aged and irregular formed forest stands, and advancing the ecological balance (Natural resources 1999).

The EU rural development programme for Flanders has forestry as one of the priority measures. The forestry measures include afforestation of agricultural land and, from the perspective of integrated rural development, a set of actions aimed at the growth of the ecological, economic and social value of forests.

The land use planning system has been revised in the “Structure Plan Flanders” (1997). The goals of the plan are a moratorium on deforestation and the afforestation of a total of 20 000 ha of abandoned agricultural lands and other lands. 10 000 ha of the new forest should be ecologically sound afforestation area. The plan also aims to protect the countryside and open space. The plan takes cognisance of different regional structures and different functions like agriculture, forestry and nature (Natural resources 1999).

A background study “Long term Forestry Plan 1996” describes the strategy for forestry policy in Flanders up to the year 2100. A first step to realisation of the long term policy is formulation of a Forestry Action Plan. Together these two documents comprise the National Forest Programme for Flanders. The key terms in forestry planning are quality and quantity (Natural resources 1999).

Walloon region

In the Walloon region the Forest Code of 1854, together with the 1994 and 1995 decrees, constitutes the legal basis for forestry. Other regulations concerning forests have been adopted: the 1994 Decree on Hunting ensures a better balance between game and forests, and the Decree on circulation in forests (1995) limits unfavourable effects to the forest ecosystem by uncontrolled tourism (Luyssaert et al. 1999).

The rules of sustainable forest management defined at the Rio and Helsinki conferences are followed in the region, and a document on forest policy by the Division of Nature and Forests sets objectives for forest management in Wallonia (Natural resources 1999):

- to ensure the regeneration and durable productivity of forest stands
- to promote natural regeneration, always to regenerate tree species perfectly adapted to site
- to maintain a balance between deciduous and coniferous stands
- to diversify the choice of tree species and encourage mixed stands
- varied age structures promoted
- to preserve the conditions and characteristics of soils, and water quality
- to take specific measures to conserve biodiversity

Forestry in Wallonia is an economic concern – for many municipalities and private owners it is a way to make a living. The Walloon region gives subsidies to public and private forest owners to encourage sustainable silvicultural practices. The most important EU ordinance for the region has been 2080/92 for the afforestation of abandoned agricultural lands. The EU Rural development programme for Wallonia has forestry and environmental protection (including forestry) as priority measures. The economic potential of forests should be balanced with a respect for their ecological and social roles. Diverse forestry aids are included in the programme, such as regeneration, stability and diversity of stands, controlled public access,

sustainable productivity, the improvement of primary timber processing, and the ecological protection of the forest environment (European Commission 2000; Luysaert et al. 1999, p. 39).

The threats to forests include parcelling out of private forests, which makes them difficult to manage. The pressure on forests from recreation and tourism use is increasing. The primary obstacles to reforestation and afforestation efforts are the attitude of agriculturists, the limited availability of land areas and the limited financial prospects for renting forest estates. This is aggravated by the long-term nature of forest investments, high maintenance charges, inappropriate taxation structures, forest fragmentation and silvicultural practices not always adapted to the site (Natural resources 1999).

The profitability of forests is low in both Flanders and Wallonia. Together with the tax system, this discourages forest ownership. Instead, forest owners often prefer to convert forest to housing or industrial uses. Loss of vitality and biodiversity in forests is also a problem in Belgium. The abundance of game limits the use of natural regeneration as the game prefers to browse the native tree species. In Flanders the pressure to use forest lands for housing, industry and infrastructure is high, and competition between different land uses is great. The high fragmentation of the existing forests makes the migration of flora and fauna between the fragments difficult or impossible (European Commission 2000; Luysaert 1999).

5.2.3 Protected forests

The total area of protected forests in Belgium is 5000 ha, 3.7% of the forest land area and 0.2% of the total land area. The area of strictly protected forest reserves in Flanders is 1250 ha (1% of forest cover) and in Wallonia 10 ha (0.002%) (Parviainen et al. 2000; Smith and Gillet 2000).

According to a WWF (World Wide Fund For Nature) report on European Forests (Halkka and Lappalainen 2001), a strong plank of Flemish government policy is the creation of new protected forest areas. The Flemish Environmental Policy Plan (MINA) proposed to create 3000 ha of forest reserve by 2002. Data on the present protected areas is good and the conservation needs of forests are well-documented. The forest law was amended in 1997 by the Flemish decree on nature Conservation and the Natural Environment. Forest will now be part of the Flemish Ecological Network (VEN). Stronger limitations concerning deforestation can also be imposed with mandatory compensation by afforestation elsewhere. Forest reserves and shelterbelts are designated by the Flemish government and must be primarily managed according to their special role. According to the WWF report Wallonia has no strict forest reserves and only nine protected forests larger than 300 ha.

5.3 Denmark

5.3.1 Current situation

Forests and plantations cover 12% of the land area of Denmark while agricultural land covers 62%. The forested area is 445 000 ha (1990) of which 417 000 ha are under tree cover. The predominant forest types in Denmark are coniferous plantations and intensely managed secondary and planted broad-leaved forests, while semi-natural (non-intervention) stands are scarce (Dragsted 1999; Hellens and Linddal 1999, p. 58).

The forested area of Denmark is increasing as a result of afforestation of arable land. Forest area has increased significantly in Denmark during the last 100 years from 200 000 ha in 1881 to 493 000 ha in 1976. Note that the 1990 (445 000 ha) inventory is not comparable to the previous inventories. During the 1990s the forest area is estimated to have increased by 10 000 - 15 000 ha, and is expected to continue increasing in the future as well, as one of the targets of the Danish land use policy is to double the forest area in a rotation (60-100 years) (Dragsted 1999; Hellens and Linddal 1999, p. 58).

The total growing stock of Danish forests is 55 mill.m³, corresponding to 132 m³/ha under tree cover. The growing stock increased throughout the twentieth century, partly due to the increased forest area and partly due to a change from broad-leaved to coniferous species. The annual increment is 7.9 m³/ha. The standing volume has been increasing during the last decade as the annual cut of 1.8-2.1 mill. m³ is below the estimated annual volume increment of 3.3 mill m³ (Dragsted 1999, p. 49-50).

The forestry sector is of little importance to the Danish economy. Expansion of forest area is suppressed by the competitive land use of the agricultural sector. The primary forest sector and the wood processing industry each contribute approximately 1% to the national GDP. The strength of the secondary forest industry is based on trade, both in raw materials and end products. More than one-third of Danish forestry's gross production value in 1995/96 originated from Christmas trees and greenery, and forests also play a key role for recreation and tourism. In an investigation in 1993-94 the total number of forest visits per year was estimated to be 50 million (Hellens and Linddal 1999, p. 58, 60).

An estimated 85% of the forest area is Forest Reserve under the Forest Act. 70% of the forests are privately owned of which about 23% are owned by companies. The remaining 30% is public forest. The forest area of Denmark is highly fragmented and parcelled. There are close to 26 000 forest properties smaller than 50 ha, of which over 13 300 are 0-5 ha in size. The Danish Forest and Nature Agency manages the state forests, which cover an area of 186 000 ha. Two-thirds of state forests (108 000 ha) are forested (25% of Danish forests), while the rest of the area consists of lakes, bogs, meadows, sand dunes and moorland (Dragsted 1999, pp. 47-48; European Commission 2000; Danish Forest and Nature Agency 2002).

5.3.2 Forest policy

The National Forest and Nature Agency at the Ministry of Environment and Energy is the body primarily responsible for the forestry sector. The planning and management of state forests is centralised at the national level with management administered in state forest districts (Natural resources 1997; Hellens and Linddal 1999).

Forestry in Denmark is regulated by the 1996 Forest Act. The 1989 Forest Act maintained wood production as a basic target, but its objectives were extended to include multiple-use forestry. The 1996 Act increased the emphasis put on non-timber values. A major requirement is for good and multiple-use forestry, but wood production, biodiversity, sustainability and the environmental interaction between forestry and surroundings are important objectives of the Act as well. The forest legislation includes a number of restrictions and regulative rules for management of the forests. The concept of Forest Reserves is maintained, i.e. forest areas clearly demarcated from surrounding areas and protected against any kind of misuse such as grazing or pannage. It is forbidden to dispose of more than 10% of a property's forest area for the production of Christmas trees and greenery (Dragsted 1999, p. 54).

The Danish forests should be managed in order to increase and improve wood production and to protect landscape amenity, nature conservation, cultural heritage and environmental protection interests as well as recreational activity interests (Forest Act 1996). Most of the private forests and all of the state and other public forests (approx. 85% of forests) are classified as forest reserves (fredskov). Forest reserves must be permanently used for forestry purposes and they may not be parcelled out or diminished by changing the size of the forest. After logging they have to be reforested, either by natural regeneration or planting. Forest reserves have to be managed according to the rules of good management practice by the Forest and Nature Agency. (Danish Forest and Nature Agency 2002)

The area of Denmark is divided into State Forest Districts (Statsskovdistrict). There are maps of the forest areas (skovkort) of each district, which show the dominating tree species, roads, and other items that have to do with forest management (Danish Forest and Nature Agency 2002).

The Danish national forest programme (Denmarks nationale skovprogram) was published in June 2002. The main objectives of the programme are:

- to promote efforts for the protection of biological diversity and secure the physical environment and the basis for forest management
- development towards increasingly economically sustainable framework conditions for the forest sector
- development of the role of forests as a national welfare benefit
- afforestation with a view towards strengthening of the potential for natural habitats and processes in afforestation
- efficient capacity building and information sharing in the forest sector
- promotion of the development towards sustainable forest management at global and regional scales

There are strategies for afforestation (1989), sustainable forest management (1994), preserving the biological diversity of forests (1992) and conservation of genetic resources of trees and bushes (1992) (Danish Forest and Nature Agency 2002).

A target of the Danish government is to double the forest area in a rotation time (80-100 years). Every year approximately 800 ha of new state forests are established, particularly near urban areas. Broadleaf species are predominant in the new forests. The Forest and Nature Agency is promoting afforestation on private lands as well, and emphasis is on the near urban areas and recreational functions of forests. Since 1996 the Forest Act has been the legal basis for private afforestation. There have been concerns that financial support for afforestation converts fertile agricultural lands into forest plantations. However, there has been a discrepancy between the objectives of afforestation policy and the areas afforested, mainly due to the high opportunity cost of farm land (Hellens and Linddal 1999, pp. 63-64).

Half of the afforestation in Denmark is planned to be on private lands, mainly on former agricultural land, and half is planned to be state afforestation. All cadastral units with woodlands planted with grants from the afforestation programme receive a status of protected forest and cannot be converted back to agricultural use. Their management must be multi-purpose. The counties are responsible for the preparation of an afforestation plan and identification of the afforestation areas. The National Forest and Nature Agency that administers the afforestation grants introduced a priority system favouring specific areas within the designated areas for afforestation. The highest priority is given to areas near to urban centres. In its short history, there has already been a shift in the goals of the Danish afforestation programme. The programme was originally promoted according to agricultural arguments, but today environmental and recreational arguments are paramount. In the planning of the afforestation areas the agricultural, forestry, water resource, nature conservation and recreational interests have to be taken into consideration (Madsen 2002, pp. 242, 244, 251).

The EU Rural development programme for Denmark 2000-2006 has, as a priority, increased integration of the environment in agriculture and forestry. Attention will be given to the quality of forests, through encouraging broad-leaved tree cultivation and using environmentally friendly management systems (European Commission 2000).

Conflicts within Danish forestry include the growing demands for “close to nature” forestry and the possibility of a ban on all exotic tree species. Traditional Danish silviculture is based on the clear-cutting system. Usually only one species is planted, but often more species are mixed in varied designs. During recent years, the emphasis in planting has shifted towards systems based on uneven-aged mixtures particularly of broad-leaved species. This will eventually move silviculture away from clear-cutting. Another issue is the need for a transition from traditional methods towards a nature-orientated type of management. This would be a policy issue in state forests, but requires economic mechanisms in private forests. If the future wood production in Denmark cannot meet the demand, the pressure on tropical forests may increase (Dragsted 1999, p. 50-51, 57).

5.3.3 Protected forests

Denmark has 6085 ha of strictly protected forest reserves (1.14% of total forest cover) and 92 000 ha of protected forests (20.7%) (Parviainen et al. 2000). A number of forests have been designated as natural woodland. Parts of the forests are left completely untouched and others are managed by coppicing. 5000 ha of untouched forests and 4000 ha of forests with adapted management practices should be secured. The aim of the government is to have 40 000 ha of natural woodlands by the year 2040. Denmark’s national strategy for sustainable development (2002, p. 51) sets a target that 10% of the forest area should have biological diversity as the primary management aim by the year 2040 and 1000 – 2000 ha of biodiversity forests should be created by 2010. The share of indigenous tree species in Danish forests should be increased to 50% by the year 2080 (Natural woodlands strategy Naturskovsstrategien 1994, Forest Act 1996, Biodiversity conventions 1992, 1994, Træartspolitikken for statsskovene 1999, Danish national forest programme 2002, p. 37).

5.4 Finland

5.4.1 Current situation

Forest comprises 86% of the land area of Finland, compared to 10% under agricultural use and 4% built up. The forestry land covers 26 mill. ha, which can be divided into three productivity classes: forest land, scrub land and waste land. This classification is based on productivity, where forest is defined as land with a mean annual increment of more than 1m³/ha (Räisänen 1999, p. 64).

The average total growing stock/ha in Finland is 92 m³/ha, and the mean annual increment is 3.8 m³/ha. The annual growth of Finnish forests has increased steadily since the 1960s (Räisänen 1999, p. 65)

Forest is the most important resource of raw materials in Finland, and in 1996 the forest sector accounted for 7.7% of GDP. Industrial forestry was developed following World War II, involving large inputs of technical skills and intensive management of forest resources geared to timber production. Since the 1960s, however, the forest sector’s share of total national economic activity has steadily declined, being presently about one half of the 1960 level (Räisänen 1999, p. 68; Mather 2001, p. 259; Palo and Uusivuori 1999, p. 301).

In Finland all forest areas are available for recreation according to the doctrine of “everyman’s” rights. There are also a large number of designated recreation areas. The areas most used for recreation are forests close to urban centres, lake and seashore forests, and forested islands in the archipelago as well as national parks and wilderness areas in northern Finland. Forest recreation is an essential part of the Finnish way of life, and the total participation rate of the population in forest recreation is an estimated 96% (Sievänen et al. 2000, p. 455; Hallikainen 1998).

58% of the total forest area is owned by non-industrial private forest owners, 29% by the state, 8% by private forest companies and 5% by others. The average size of a non-industrial private forest holding is 38 ha and there are 300 000 – 400 000 private forest owners with a minimum holding size of 1-5 ha (Palo and Uusivuori 1999, p. 309).

5.4.2 Forest policy

Finnish forest legislation was reformed in the 1990s. The main purpose of private forest legislation since the 1880s has been to prevent both the destruction and inappropriate use of forests. The aim of the new Forestry Act (1997) is to promote economically, ecologically and socially sustainable management and utilisation of forests in such a way that they can offer a sustainable satisfactory yield whilst maintaining biological diversity. The new act can be viewed as a response to “green” values in Finnish society, as well as a signal of compliance to the forestry principles laid out at the Rio UNCED in 1992. The law is also a departure from the former, centrally planned to a more regionally planned forestry sector (Räisänen 1999, pp. 70-72; Palo and Uusivuori 1999, p. 307).

The National Forest Programme of Finland 2010 (Ministry of Agriculture and Forestry 1999) covers forest utilisation as seen from an economic, ecological, social and cultural perspective. The programme is designed to meet both domestic demands and the new international forest policy norms. The aim of the National Forest Programme is to meet domestic and international requirements in order to develop forest management and protection along such lines that the forests will provide the Finns with as much work and sources of livelihood as possible, remain healthy, vital and diverse, and provide spiritual and physical recreation for the Finnish people. Nevertheless, the targets of the NFP have a strong economic emphasis, and environmental and social perspectives receive less attention (Ministry of Agriculture and Forestry 1999; Viitala 2003, pp. 199-202).

The target of the programme is to increase the forest industry’s annual use of domestic roundwood by 5-10 million cubic metres by the year 2010, to double the value of the wood industry’s exports to EUR 4.2 billion/year and to increase the annual use of wood for energy production by 5 million cubic metres. The target rate of industrial roundwood production is 63-68 million m³/year. An increase in roundwood production demands the complete implementation of the Finnish forest management recommendations, which include reforestation, tending of seedling stands, ditch cleaning and first thinnings. According to the calculations for different harvesting alternatives conducted during preparation of the national forest programme, the largest sustainable roundwood production in Finland would be 67 million m³/year up to 2005 and it could rise gradually to 74 million m³ by the year 2030. An annual harvesting rate of 80 million m³ would lead to a decrease in the growing stock to 1 400 million m³ by the mid 2010s (Ministry of Agriculture and Forestry 1999).

A growth in harvesting volume will gradually increase the clear-cutting area from its present annual level of 130 000 ha to 135 000 – 150 000 ha/year, followed by a decline after a decade to an annual level of 120 000- 130 000 ha. The increase in

forest management will be concentrated on young stands (150 000 – 250 000 ha/year), first thinnings (100 000 – 250 000 ha/year) and ditch cleaning and supplementary ditching (75 000– 110 000 ha/year). In the 1990s an annual aggregated area of about 8 000 ha of fields excluded from agricultural production have undergone afforestation. Another 2 000 ha/year have undergone afforestation on land left bare after peat harvesting (Ministry of Agriculture and Forestry 1999).

In 1999 a strategic environmental assessment (SEA) was prepared of the Finnish National Forest Programme (Hilden et al. 1999). According to the report the roundwood production volume of 60 million m³/year would conserve the amount of large timber size trees at the 1996 level up to the year 2026, but larger production volumes would decrease the amount of large trees in forests. Furthermore, the share of the different tree species and the age structure of forests are affected by the harvesting volumes. In particular, the amount of spruce will decrease in the alternatives that advocate roundwood production above the 1987-96 levels (by approx. 50 million m³). These factors will have an impact on the biodiversity of forests. The SEA states that only with roundwood production volumes of approximately 60 million m³ or smaller can biodiversity be conserved with the present management practices and guidelines. The issues raised in the SEA did not, however, change the feasibility of the NFP (Ollonqvist 2002, p. 44).

The NFP of Finland promoted opportunities for inter-sectoral policy coordination. There is also formal regional commitment to the targets of the programme and regional participation in forest policy issues is enhanced. Policy actions for the implementation of the economic goals started immediately after the acceptance of the programme in 1999. Resolution of conflicts over ecological and social sustainability of the NFP was postponed until the implementation stage (Ollonqvist 2002, p. 44-45).

5.4.3 Protected forests

Protected forest areas in Finland are concentrated in the northern parts of the country and cover 2.44 million ha or 10.6% of the total forest cover. Of this, an area of 1.53 million ha (6.6% of the forest cover) is strictly protected . (Parviainen et al. 2000). A target, financing and action programme for the conservation of forests in southern Finland, the western parts of the province of Oulu and the south-western regions of Lapland has recently been prepared (July 2002). The Committee that prepared the programme based its work on a Working Group report on the need for forest protection in southern Finland and Ostrobothnia (Ministry of the Environment 2000). The programme did not include designated areas for protection or maps. The committee examined the required conservation measures and financial resources, and recommended management measures that should ensure protection of forest biotopes in southern Finland. The protection of forests in southern Finland is presently a controversial subject, where the views and needs of environmental groups and private forest owners diverge (Ministry of Environment 2002; Helsingin Sanomat 3.4.2002).

5.5 France

5.5.1 Current situation

France has one of the largest forest resources in Europe; forests and other wooded land accounts for just less than 28% of the total land area, or 15.34 million ha. Natural forests cover 14.36 million ha and plantations 961 000 ha. There is 0.3 ha of forest

per capita in France. The main forest regions are the Massif Central, Alps, Jura, Vosges, Alsace-Lorraine and the Landes in the southwest which is the largest man-made forest in Europe. Agricultural lands cover 56.5% of the total land area and France is one of the biggest agricultural producers in Europe. 75% of the French population live in urban areas (FAO Forestry 2002; European Commission 2000; Piel et al. 1999, pp. 81-83).

The area and proportion of wooded lands in France have increased since the Second World War. The average annual expansion rate was 25 000 ha from 1978 to 1989. Between the years 1990-2000 the forest area increased by 62 000 ha or 0.4%. The relatively quick rate of increase from 1950 to 1970 (75 000 ha/year) can at least partly be explained by a change in national survey methodology and the overestimation of the French woodland increase during the period from 1965 to 1970 (Nucifora 2001; Piel et al 1999, p. 82; FAO Forestry 2002).

The average standing volume in the French forests is 138 m³/ha rising by 14% since 1984. French forests are now in a timber capitalisation phase, partly explained by the afforestation programmes undertaken during the past 50 years. Part of the increase in standing volume can also be explained by the use of more dynamic silvicultural practices, tree improvement and possibly by a general rise in productivity (Piel et al 1999, pp. 84-85).

More than 70% of the French forests consist of mixed stands. During the last ten years, monospecies stands have slightly dwindled, whereas mixtures with 3 species or more have increased. In regular high forests the average area regenerated annually is 60 500 ha. 27% of the area is natural regeneration. Detailed maps are at <http://www.inf.fr/> (Inventaire Forestier National 1998).

State and communal forests account for 26% of the forested area, with the remaining 74% under private ownership. The mean forest area per owner is 2.6 ha. Private companies own 18% of the forest area (Piel et al 1999, p. 82).

5.5.2 Forest policy

The Ministry of Agriculture is responsible for forestry issues. The Forest Act "Code forestier" is an extensive body of law including both legislative provisions and implementing regulations concerning among other things forest management plans, forest conservation, clear felling and fire prevention and fighting. A forest management plan is mandatory for public and community forests and all private forests exceeding 25 ha. Logging is under strict control in public as well as in private forests and the management plan defines the felling permitted. Any clearing in a private woodland (over 4 ha) needs an official authorisation. Woodlands below 4 ha in size also have some restrictions concerning clearings, especially if they have protection or conservation value (Piel et al. 1999, p. 90-91; FAO Forestry 2002)

Forest policies in France highlight the target of multiplicity in forestry. The aim is to combine both the productivity and the social values of the forest and to aspire toward economically, socially and ecologically sustainable forestry. There are three main objectives for forest policies in France: protection of the forest resource, achievement of larger management units by trying to prevent the fragmentation of properties, and encouragement of long-term investments. There are grants in the form of subsidies or exemptions from taxes. The tax system in France offers fiscal dis-incentives for woodland ownership. Every landowner has to pay a property tax, which depends on the type of land. The tax rate is higher for woodland than any other land use; this is because there are no other subsequent taxes for wood production (Nucifora 2001; Piel et al. 1999, p. 92; Natural resources 2000).

The current French forest policy aims to meet society's expectations as follows:

- to enhance the forests' potential for economic and social use
- to preserve and improve the forests' ecological wealth and variety of landscape
- to increase efforts to create a balanced rural environment (Buttond 1999, pp. 91-92).

Even if the general concepts of sustainable development and multi-functional aspects of forestry are not formally laid down as principles, they are used as guidelines and governed by a set of national and local regulations. The silviculture still follows classical methods, but in recent years an evolution has been perceptible in favour of more mixed uneven-aged stands, less clear felling and less exotic species. However, property rights still have a high level of protection, even against more public needs such as environmental concerns. Ecological and landscape considerations in forest policy are sometimes considered by forest owners and managers as constraints in achieving production goals (Buttond 1999, p. 90).

The priority measures of the French national rural development plan 2000-06 include developing forestry resources and the added value and the quality of agricultural and forestry products. The programme's targets for forestry are reforestation of 4200 ha of run-down forests/year, afforestation of 9500 ha of agricultural land/year, and creation of 1610 km of forest roads/year. The programme seeks to encourage productive investments in forestry through financial engineering mechanisms. This involves promotion of the wood sector and ensuring the sustainable management of forests and the protection of the forest environment. By going beyond good practice, the measures should fight the greenhouse effect. Forest potential damaged by storms or fires will be restored, and policy measures will be taken for forest fire prevention. A policy of modernisation, adaptation and development is being pursued for forest holdings in collecting wood (European Commission 2000)

5.5.3 Protected forests

Natural forests cover about 30 000 ha (0.20% of the forest area) and are mostly in the mountain regions. 1.2% of the forests are protected under different forest laws, the main purpose of protection being biodiversity conservation. The area of strictly protected forest reserves is 14 000 ha (0.1% of forest cover) (Ministry of Agriculture and Forestry 2002; Parviainen et al. 2000).

The Forest National Office (ONF) has published an instruction concerning the setting up of an integral biological reserves network, which is the strongest protection status (IUCN I). Currently the network only concerns public forests. Both the ministries of environment and agriculture have approved the instruction. A natural areas protection strategy has been initiated by the Réserve Naturelle de France (RNF) and the ONF by monitoring programmes of current nature and biological reserves (Berenger 2000).

The government has clearly expressed its commitment to the international conventions (especially the convention on biological diversity and the MCPFE Conferences of Strasbourg and Helsinki) as well as to European directives. A consistent ecological network has been set up through the creation of integral biological reserves networks in state forests. The protected areas network in France is based on criteria of ecological representativeness rather than on quantitative criteria. With the current rate of protection it would take 140 years to protect 10% of the forest area. (Berenger 2000)

Of the 180 000 ha of protected forest area, 80 600 ha are so-called “first type protected areas” that include sites for erosion prevention in the mountains and hills, and avalanche and flood prevention areas (Inventaire Forestier...1998).

5.6 Germany

5.6.1 Current situation

Forests cover 10.740 million ha (30%) of the territory of Germany. The forest area per capita is 0.1 ha. Coniferous trees prevail on around 70% of the forest area, partly mixed with deciduous trees and frequently in regions where they did not exist before systematic forestry began. The main tree species in Germany today are spruce, pine, beech and oak (Federal Ministry...2002; Forests and forest industries...2000).

Germany is one of the most densely populated countries in Europe. More than 70% of the population live in cities with over 10 000 inhabitants. The development of the land use structure in Germany is characterized by a constant increase in the land used for settlements and transport networks. Agricultural land covers 55% of the total land area, forest 29%, settlements 7% and traffic areas 4.6% (Schraml et al. 1999, pp. 119-120).

At the end of the 18th century Germany faced a timber shortage, and regulated forestry was introduced. Sustainability became the major goal in timber production. Afforestation led to a slow increase in forest area. An increase in timber demand after the World Wars along with agricultural overproduction later led to afforestation and the present dominance of coniferous tree species. During the period 1950-1989 the forest area increased from 6.95 mill ha in 1950 to 7.4 mill ha. (Schraml et al. 1999, p. 117).

The average growing stock is 270 m³/ha; in the western part of the country about 300 m³/ha and in the eastern part 210 m³/ha. The average increment is 6 m³/ha per year and currently about 70% of the increment potential is used (Schraml et al. 1999, pp. 119-120).

By law all forests are subject to general access by the population for the purpose of recreation. According to studies, an average 170 people/ha enter the forests annually for recreation, while in the metropolitan areas the number can be as high as 1000 people/ha/year (Schraml et al. 1999, p. 125).

46% of the German forests are privately owned by 1.3 million forest owners and mainly comprising small forests. 34% are owned by the Federal States, 20% by public law corporations and 3% by the Federal Government (National forest programme 2000).

5.6.2 Forest policy

The Federal Ministry of Food, Agriculture and Forestry (BML) is primarily responsible for forestry. The tasks of the Federal states' (Länder) forest authorities include regional legislation and supervision of implementation, participation in planning procedures and managing state-owned forests (Federal Ministry...2002).

The Federal Forest Act (1975) requires all forest owners to conserve forests because of their multifunctional importance, to expand the forests if required and to ensure their proper management on a sustainable basis. The Forest Act include an obligation to reforest after final harvesting, limited clear-cut areas, an approval process for conversion of forests into other land uses (harvesting and replanting requires the approval of up to four levels of administration) and precautionary

actions in regard to environmental protection. The law promotes forest development and designation of protected forests and recreation forests. (Natural resources 2000; National forest policies; Cirelli and Schmithüsen 2000)

Germany's state forest policies are based on three major goals: 1) strengthening forest enterprise capacities, 2) promotion of the competitiveness of timber, and 3) increasing the stability of forests (Schraml et al. 1999, p. 128, 130).

A Forest Policy Concept was elaborated in 1996. Close-to-nature forest management is increasingly practised in regional forest administration. This form of forest management aims at creating a forest close to natural conditions and at reaching ecological and economic stability in the long term. It contributes to securing and maintaining biodiversity (Natural resources 2000).

The National Forest Programme of Germany (Oct. 2000) provides a basis for BML's future forest policy. The programme is not defined as an operational specialized political programme but an ongoing dialogue determining the foundations for a social consensus on the sustainable development of forests from economic, ecological and social aspects (Federal Ministry... 2002).

Recent forest policies and programmes at the federal level are:

- National Forest Plan 1994
- Forest Policy Concept 1996
- a variety of forest related programmes in areas such as air pollution, conservation of genetic resources and promotion of renewable resources (Natural resources 2000)

EU incentives for afforestation offered by the Common Agricultural Policy have led to an overall increase in afforestation areas. In West Germany in 1985 1312 ha were afforested, in 1990 2447 ha and in 1992 6156 ha. Afforestation is often criticised in Germany on the grounds that it often takes place on marginal soil sites with little agricultural value but of high ecological importance. The new EU Rural development programme for Germany also includes afforestation measures (Schraml et al. 1999, p. 131; European Commission 2000).

5.6.3 Protected areas

There are 400 000 ha of protected forest areas in Germany. The nature conservation areas established by the Nature Conservation Law are divided into nine categories and protection areas established by the Forest Law into two categories. The area of strictly protected forest reserves is 25 000 ha (0.3% of total forest cover). (Ministry of Agriculture and Forests 2002; Parviainen et al. 2000)

In Germany the protected areas are under the authority of the states (Länder). Protected areas are often assigned more than one protective status, thus hindering overall assessment of the extent, management and category of protected areas in Germany. At present no clear national strategies or commitments to promote and increase protected areas exist. Some regions have goals to increase their protected forest areas (Griesshammer 2000; National forest programme 2000.)

The national forest programme of Germany (2000) lists as needs for action:

- implementing the Natura 2000-concept, taking requirements of nature conservation and ownership rights into account
- expanding forests and combining fragmented forest areas to form ecosystem networks

The strategy for the conservation and sustainable use of biological diversity in German forests has the following measures for forest protection:

- carrying out special biotope and species conservation measures, if required, in addition to considering biological diversity in forest management
- in many regions the existing conservation area systems are considered to be largely complete. In other regions establishment of new forest conservation areas or enlargement of existing ones is planned, but areas are not specified.

5.7 Greece

5.7.1 Current situation

The forest area of Greece is 6.5 mill ha according to Greece's national definition of forest (an area of at least 0.5 ha or a strip of land 30 m wide with at least 10% tree coverage and forest type vegetation). This is substantially larger than the area given by the FAO forest classification, 3.6 mill ha or 28% of the total land area (Hellenic Ministry...2002; FAO Forestry 2002).

Based on the national definition, about 20% of the total land area consists of forest lands, 24% of non-productive forests, 34% are agricultural lands and 13% rangelands (European Commission 2000; Smiris 1999, p. 142). High forests cover 36% of the forest area, coppice 47% and coppice with standards 17%. The average growing stock is 62.4 m³/ha. The mean annual increment is 2.76 m³/ha and the mean annual timber cut is 1.6 m³/ha (Smiris 1999, p. 143).

The forests serve an environmental rather than productive function in Greece. The top priority of Greek forestry is forest, soil and water protection and not production. Greek forests cannot be separated into "managed" and "protected" as is done in northern Europe. The gross income from forestry is larger than costs for operations, but is insufficient to cover costs for management. Management is done mainly for protection and is not intensive. Non-managed forests are usually degraded and endangered by wildfires, grazing and soil erosion (Natural resources 2000; Papageorgiou 2000; Rodoglou and Raftoyannis 2000).

In recent years the demand for recreation in forests has risen in both peri-urban areas and mountain regions. The demand for water has risen as well, and it has become necessary to manage the forests from a watershed management perspective. Public sensitivity towards protection of the environment has increased and there is a growing demand for national parks (European Commission 2000; Smiris 1999, p. 143).

Forest fires are a major problem in Greece and the major cause of deforestation. In the 1990s there were an average of 1900 fires/year, the average area affected by fire being 19 700 ha/year and the area destroyed 3000 ha/year. Land ownership patterns, grazing rights on public lands and land speculation are the main obstacles to effective reforestation. The areas considered most vulnerable to desertification due to their climatic regime include the eastern Peloponnese, south and central Macedonia, Thessaly, many Aegean islands, Attica and Crete (Natural resources 2000; Papageorgiou 2000).

65% of the forests are state owned, 12% are communal, 10% are owned by co-operatives, 5% are monastic and 8% are privately owned (European Commission 2000; Smiris 1999, p. 142).

5.7.2 Forest policy

The Directorate of Forests, part of the General Secretariat of Agriculture in the Ministry of Agriculture, has been responsible for forestry issues since 1998. The Central Forest Service is responsible for planning, co-ordination and assurance of

appropriate financial resources for forestry and the regional services are in charge of forest management, protection, improvement, engineering works and wood production. The Greek constitution (1975) prohibits forest land use changes in all forests, unless the change is enforced by public interest. State and private forests and other wooded land areas destroyed by fire and other causes are obligatorily under a reforestation regime and their disposal for other purposes is prohibited (EFC Country national reports 2000; Natural resources 2000).

There has been legislation and administration of forests in Greece since 1836, a major goal being the rational exploitation of forests. Since 1951 continuous efforts have been made to restore and improve the forests, to prevent soil erosion and flooding, to develop game-keeping, to increase the number of national parks, to carry out recreational and mountain tourism projects and to establish and improve urban forests. A Strategy Plan for Forestry was established in 1986 and a development programme in 1989 (Smiris 1999, p. 142; Natural resources 2000).

The development and exploitation of forests in Greece is done within the framework of EU co-funded programmes: functional programmes of forest measurements, the programme INTERREG II, regional programmes, and programmes related to Regulations 867/90 (on improving the processing and marketing conditions for forestry products), 2157/92 (on the protection of forests against atmospheric pollution), 2158/92 (on protection of forests against fire) and 2080/92 and its continuation, 1257/99 (instituting a Community aid scheme for forestry measures in agriculture).

In the EU rural development programme for Greece 2000-2006, priority actions include agro-environmental measures and afforestation of agricultural lands. The afforestation measures consist of aid to meet the costs of afforestation and allowances to offset the loss of income arising from the planting of trees on agricultural land. The afforestation target is 14 000 ha of agricultural land. The aim of reforestation and afforestation in Greece is to give priority to species resistant to forest fires (European Commission 2000).

5.7.3 Protected forests

The area of strict forest reserves in Greece is 142 000 ha (1% of total forest cover) and the area of all protected forests is 951 700 ha or 14.6% of total forest cover. The national parks have a core area that is under strict protection (approximately 1500 ha) and an area around the core area that is under restricted economic use (Parviainen et al. 2000; Ministry of Agriculture and Forestry 2002).

There is clear government commitment to increase both the area and quality of protected forests to the level needed to sustain biodiversity. The General Secretariat of Forests pledged to increase the protected areas up to 10% of total Greek forest area by the year 2000 and this proportion has been surpassed. The Action Programme of the Operational Environmental Programme of Greece is to support protection measures of 100 biotopes included in the Natura 2000 list. The programme also covers the protection and management of forest ecosystems. The Operational Environmental Programme is the first to propose significant amounts of investment for the protection of natural sites in Greece (Natural resources 2000; Papageorgiou 2000).

5.8 Ireland

5.8.1 Current situation

The total forest area of Ireland is about 650 000 ha, or about 9% of the land area. The dominating land use is agriculture, which comprises 80% of the total land area (Coillte 2002).

There are no legal definitions for the terms forest and forestry in Ireland. A practical definition for forest is an area of at least 0.5 ha (sometimes, in the case of broadleaves, 0.2 ha) with a minimum width of 40 m over no more than two-thirds of its length, with at least 50% canopy cover by trees. The term forestry covers the theory and practice of the whole constitution and management of forests, and the utilisation of their products (Nieuwenhuis 1999, p. 168).

As a result of population pressure, settlements, pasture, tillage and later colonization and commercial exploitation, the forests of Ireland were cleared to the extent that by 1600 it is estimated that only about 12% of Ireland was covered in forest. The exploitation of forests intensified and by 1905 the area under forest was about 1% of the total land area or 100 000 ha. State forestry began in 1903 with the acquisition of woodland areas. Public forests now total about 390 000 ha, which is 5% of the land area and almost 70% of the forests (Nieuwenhuis 1999, p. 168).

27% of the forests or 143 000 ha are in private ownership. The largest single landowner and forest owner in Ireland is Coillte Teoranta, a state-owned commercial forest company. The Coillte estate comprises 438 000 ha of forestland of which approximately 390 000 ha are productive forests, and has roundwood sales of 2.5 mill m³. The average size of forest land owned by private owners is 10 ha. (Nieuwenhuis 1999, pp. 168-169; Coillte 2002)

The forestry sector in Ireland is based primarily on plantation forests. The average growing stock in Ireland is around 100 m³/ha, which is low due to the age class structure of the forests. The average annual yield is 8.5 m³/ha; for all conifers the average yield class is 14 m³/ha/year. Most of the new plantings in recent years have shown yield classes in excess of 20 m³/ha/year. At present roundwood removals come almost solely from Coillte owned lands. In 1995, Coillte sold 2.1 mill m³ of timber; the timber flow from private forests was approximately 200 000 m³. Christmas trees and foliage production are the two most important non-timber forest products (Nieuwenhuis 1999).

In Ireland there is a small area of indigenous forest, which is protected by conservation measures. About 5200 ha of semi-natural forests are protected in natural parks and nature reserves. There is a substantial and growing interest in Ireland in the use of forests for recreation and education. There is no formal right of access to forests, but state owned forests have in general been open to the public since the early 1970s, when the Forest Service began to develop the "open forest policy" by creating nature trails, forest parks and other facilities. Coillte Teoranta has maintained access to these forests. Access to privately owned forests is at the discretion of the owner (Nieuwenhuis 1999, p. 177).

5.8.2 Forest policy

The Forest Service, a division of the Department of Marine and Natural Resources, is responsible for ensuring the development of forestry within Ireland. The strategic objectives of the Forest Service are:

- to foster the efficient and sustainable development of forestry
- to increase quality planting
- to promote the planting of diverse species

- to improve the level of farmer participation in forestry
- to promote research and training in the sector
- to encourage increased employment in the sector

The main strategy of the Forest service is to develop the forestry sector via a range of financial incentives. The planting target is 25 000 ha/year up until the year 2000 and 20 000 ha/year from 2001 (Department of Communications...2002).

The current forestry legislation of the Republic of Ireland consists of the Forestry Acts 1946, 1956, 1988 and the Wildlife Act 1976. The Forestry Acts 1946 and 1956 require review as they reflect the circumstances at a time when the forest estate was smaller, timber shortages required strict control of felling, afforestation was mainly a state operation and issues such as the environment, amenity and multi-purpose forestry were not concerns of the Minister (Niewenhuis 1999, p. 177).

Ireland has a Strategic Plan for the Development of the Forestry Sector in Ireland (1996). The overall aim of the plan is to develop forestry to a scale and in a manner which maximizes its contribution to national economic and social well-being on a sustainable basis and which is compatible with the protection of the environment. The Strategic Plan proposes a sustained programme of afforestation to increase the forest area to almost 1.2 mill ha or 17% of the total land area. The planting target of the Forest Service is 20 000 ha/year up to year 2035 (25 000 ha/year up until year 2000). The plan foresees the output of timber from Irish forests increasing four-fold up to the year 2030. The actual availability of land suitable for forestry is limited by environmental restrictions and the existence of archaeological sites. These restrictions may affect up to 10% of the land otherwise available for forestry (Niewenhuis 1999; Department of Communications...2002).

The Forest Service is implementing sustainable forest management, which is in accordance with the six pan-European criteria for sustainable forest management (MCPFE) developed in Lisbon 1998 (Department of Communications...2002). Provision of grants and premiums for forestry is supported by a number of programmes that are all funded from the National development programme (NDP). These programmes are (Department of Communications... 2002):

- the Rural Development Plan 2000-2006
- the Southern and Eastern Regional Operational Programme 2000-2006
- the Border, Midlands and Western Regional Operational Programme 2000-2006
- the Employment and Human Resources Development Operational Programme 2000-2006

The Regional Operational Programmes aim to provide necessary support measures to achieve annual planting targets and to develop downstream industry to utilise the expected increase of 50% in timber production in the coming years. The Employment and Human Resources Development Operational programme provides grant aid for forestry training projects (Department of Communications...2002).

The EU supported Rural Development Programme for Ireland 2000-2006 has afforestation as one priority action. The afforestation scheme provides grants for new planting, promotes alternative uses of agricultural land and development of forestry on farmland. The Forestry Premium scheme provides annual hectare payments on farm woodland and additional funding is provided four years after initial planting (European Commission 2000).

70% of all Irish forests are owned by Coillte, which was established in 1989. Since then Coillte has expanded its estate by over 40 000 ha by planting. A core principle in the company's forest management policies is that the extent of the forest should be maintained in order to ensure long-term sustainability. Only in the past ten years has there been significant farmer involvement in forestry; before that all afforestation had been done by the state. Changes in the land market and

the regulatory regime has changed Coillte's role in achieving the national forest planting targets. Instead of purchasing land and planting it, the company is focusing in assisting farmers in investing in forestry. There are two measures: Coillte's Farm Forestry Partnership Scheme and providing planting services to farmers (Department of Communications...2002)

In addition to expanding the forest estate Coillte is focused on improving the quality of the forests and their management. Coillte has large areas of upland forest from previous government policies that favoured planting of conifers on marginal upland agricultural areas. The policy of Coillte is to create forests that are productive, attractive and in harmony with the landscape. Large even-aged forest blocks (greater than 60 ha) are restructured to create greater diversity in age structure and tree species composition. Presently the predominant silvicultural system used in Coillte is based on clear felling. A program of testing of continuous cover silvicultural systems is starting as Coillte now also has better quality land and diversifying the species composition of forests is becoming possible. Planting of Sitka spruce has decreased from 86% in 1993 to 66% in 2000. These reductions have been made up by increases in the planting of larch, Norway spruce and broadleaves. Sitka spruce will stay as the main tree species up to a max. of 65%. An overall target is to have 10% of broadleaves in annual plantings and native species will be used when available (Coillte 2002).

Coillte has information available on its forests for forest area, species distribution, land classification, age classification and forest health, but only in tabular form. No maps are available at their web site (Coillte 2002).

5.8.3 Protected forests

The area of strict forest reserves in Ireland is 5736 ha or 1% of the total forest cover. All the protected forests in Ireland are classified as strictly protected forests (Parviainen et al. 2000).

Duchas The Heritage Service, Department of the Environment, is the organisation charged with designating protected forest areas in Ireland. The protected forest areas are designated as Natura Sites, National Parks and Natural Heritage Areas. The areas of individual forest protection areas are not large, ranging from 7 to 2500 ha (personal communication Noel Foley July 12, 2002; Parviainen et al. 2000)

Natura Forest Sites have been designated for their intrinsic forest values and are semi-natural woodlands. The Native Woodland Scheme is a programme of the Forest Service that consists of two elements: Native Woodland Conservation and Native Woodland Establishment. The primary objective of the scheme is to protect and expand Ireland's native woodland resource and associated biodiversity using appropriate close-to-nature silviculture. Where compatible, wood production is also encouraged but it is secondary to conservation and biodiversity. The People's Millennium Forests-project that also raises the profile of Ireland's semi-natural woodlands consists of tree planting and woodland restoration (Noel Foley July 12, 2002; Native Woodland Scheme 2001).

The Forest Biodiversity Guidelines sets a target that approximately 15% of the forest area must be treated with particular regard to biodiversity. The following guidelines for the selection of tree species to incorporate biodiversity considerations into forest management practices are given (Forest Biodiversity Guidelines 2000):

- mixtures can include native and non-native broadleaves and conifers, and must be silviculturally compatible
- broadleaf species should be favoured as much as possible and native tree species should be selected where possible, using local or Irish provenance

- if non-native species are used, at least two species should be included in the mix. In all cases, the dominant species should account for no more than 80% of the mix.
- natural regeneration of desirable species on the site should be promoted.

5.9 Italy

5.9.1 Current situation

The total forest area in Italy is 8.7 million ha (29% of the total land area), of which high forests comprise about 25% and coppices more than 40%. The remaining 35% is plantation forest or scrub, marquis, rocky or riparian woods (Corrado and Merlo 1999).

The national growing stock for high forests is about 211 m³/ha/year and the annual increment on average 7.9 m³/ha. The annual yield in high forests rarely exceeds 50% of the annual growth and harvesting is on average 35% of the increment. The low level of removals is due both to natural capital conservation and to abandonment, particularly of private forests. The reason for abandonment is often the high costs of exploitation and the small size of forest plots and enterprises. Forest fires are a problem in Italy. For example in 1995, 18 250 ha, or 0.3% of the total forest area, were affected by forest fire. (Colpi et al. 1999, pp. 190-192; Corrado and Merlo 1999, pp. 157-158).

According to the National Forest Inventory, 60% of the forests are predominantly managed for production. This means that forests are managed for timber production, but have other functions as well. 34% of forests are managed for protection and 6% for recreation. The 1985 Landscape Act states that all forests play, above all, an environmental role. Cutting is allowed as far as it is useful for the care of the forests, with the exception of plantations. 66% of the forests are private and 34% are public. Private forestry is characterized by fragmented forest plots, often abandoned in mountainous and hilly areas. (Corrado and Merlo 1999).

Italian forests have an important landscape and social function, but are less important economically. The contribution of forestry to the Italian economy is almost nil (0.05% of GDP), and Italy imports about 50% of rough timber. However, when welfare and the tourism industry are taken into account, the significance of the forests is completely reversed. Indirect market effects of the forests are widely recognized. According to research, almost all of Italian people (96%) participate in recreation activities involving the forest and Italian forests are subject to a human pressure of about 20 visits/year/ha (Sievänen et al. 2000, pp. 454, 457-458; Corrado and Merlo 1999, p. 158).

5.9.2 Forest policy

Italy is composed of 20 regions, and a strong decentralisation process has been implemented in the forestry sector since 1972. Administrative responsibilities for forestry and related matters have been transferred to the regions (Figure 4), some of which, mainly in the north of Italy, have organised regional forest services and have their own forest laws. Other regions, mainly in the south, still make use of the Corpo Forestale dello Stato, State Forest Service, for the implementation of forest policies. Some regions have also decentralised the forestry sector to the local, provincial level (Colpi et al. 1999, p. 188, 198). A Central Ministry of Agricultural and Forest Policies (Ministero delle Politiche Agricole e Forestali) remains in existence, but with limited functions (Ministry of Agricultural and Forest Policies 2002).

Forestry in Italy is becoming more and more integrated into general land development schemes based on integrated planning. The Nature and Landscape Act of 1985 provides for regional landscape plans with consequences for the role of forestland and its management. Most of the regions have completed regional landscape plans (Piano territoriale...2002). The Landscape Act is under the jurisdiction of the Ministry of the Environment (Ministry of the Environment 2002; Cirelli and Schmithüsen 2000; Corrado and Merlo 1999).

The Central Forest Administration acts by means of the Corpo Forestale dello Stato (CFS) (Corpo Forestale...2002), which is a police force under the Ministry of Agricultural/ Forest Policies. The status of CFS as a police force has prevented its assignment to the regions and it has remained under the State control. The CFS mainly works by means of agreements with the regions, parks and other local authorities (Corrado and Merlo 1999).

Regulation of forestry in Italy is determined to a large extent by the Forest Law of 1923 and by regulations issued to implement it. The law deals with restrictions imposed on forest owners in order to conserve water resources and protect against avalanches or wind erosion. Penalties in case of violations are set out. Procedures and authorities are specified for reforestation of mountain basins. The law also regulates land management practices of traditional land owning associations (universita' agrarie). 89% of the forests were primarily designated and subject to the hydro-geological bond, prohibiting changes in land use and imposing specific management practices: selection felling, uneven-aged and multispecies stands, natural regeneration. The main principles of the 1923 Forest Law have also been incorporated into the different regional laws (Cirelli and Schmithüsen 2000; Corrado and Merlo 1999).

The 1985 Landscape Act states that all forests play, above all, an environmental role and imposes nature-oriented forest management. Timber exploitation is the exception rather than the rule in forest management. Cutting is allowed as far as it is useful for the care of the forests, with the exception of plantations. The Landscape Act is under the jurisdiction of the Ministry of the Environment.

The Law on the Protection of Forests against Fires of 1975 requires the preparation of regional plans indicating the degree to which the forest areas are prone to fires and the means of prevention and fire fighting. The law prohibits building on land destroyed or damaged by fire, though subsequent legislation has de-classified this type of offence such that it is no longer a criminal offence, merely an administrative one (Cirelli and Schmithüsen 2000).

As a result of the decentralisation of the forestry sector in Italy, it is difficult to find common patterns in forest policies nationwide. While some regions are more concerned about expanding the forest area and protecting the forest environment, other regions stress the economic role of forests and carry out programmes of assistance to forest owners and enterprises. Regional forest policies tend to have only one or a few objectives as a consequence of reduced public spending on the sector. There is a lack of clear long-term objectives and an integrated approach to forestry (Colpi et al. 1999, p. 198-199). The forest policies and forest characteristics of each region are presented in Appendix 1.

5.9.3 Protected forests

The protected forests of Italy are divided into seven categories and are mostly situated in mountain regions. The protected areas cover 2.1 mill. ha or 7% of the total land area. Most of the protected areas have a strictly protected core area where access is allowed only for scientific research purposes. Protected forest areas cover 560 000 ha, of which 62 000 ha (0.7% of total forest cover) are strictly protected (Ministry of Agriculture and Forestry 2002; Parviainen et al. 2000).

5.10 The Netherlands

5.10.1 Current situation

Most of the landscape of the Netherlands is man made. Polders have been recovered from the sea since the Middle Ages, with major efforts during the 17th century and again after World War II. Large areas of drifting sands and heathlands have been brought into use through afforestation by private landowners and by the state.

The Netherlands is very densely populated. The population is estimated to increase by 0.35% during 2000-2005. 89% of the population live in urban areas and the urban population is estimated to increase 0.45% up to 2005. The land area is in heavy agricultural use, the Dutch agriculture sector being a major industry. Agricultural land covers 71% of the total land area, 10% are forests and 8% are built-up areas. The average area of forest per capita is 235 m² (Schmidt 1999, p. 232; EFC Country national reports 2000; Natural Resources Aspects 1997; Ministry of agriculture...2002; Facts and Figures 2000).

Forest is defined in the Netherlands as land area covered with trees or bushes with an area of at least 0.5 ha and a minimum width of 30 m. For practical policy purposes, however, the minimum area for forest is considered to be 5 ha. Two classes are distinguished: closed forest (>60% canopy cover) and open forest (<60% canopy cover). Forestry is defined as all resolute human activities aimed at sustainable fulfilment of all forest functions for different groups in society (Schmidt 1999, p. 232).

At the beginning of the 19th century only about 2% (70 000ha) of the land area was covered by forests. Forests had been destroyed by overexploitation during the centuries. Since then, private landowners and the state afforested large areas of land, mostly on poorer soils. Afforestation continued during the 19th century to contribute to the landscaping of new polders. Since 1975 afforestation has also taken place on better soils and lands suitable for agriculture. This is a consequence of the gradual decline in importance of agriculture. Forest cover increased from 270 000 ha in 1900 to 340 000 ha in 1993. At the same time the area covered by houses, industrial structures and other infrastructure has also increased at a more rapid rate than the forest. The increase in forest area is still continuing, with an annual increase of approximately 1000 ha or 0.3%. The Dutch government aims for a forest area of 400 000 ha by 2020 (Schmidt 1999, p. 232; Wiersum and van Vliet 1999, p. 176).

The standing stock in the Dutch forests is 185 m³/ha. The annual increment is 8.1 m³/ha (1995). The annual cut increased from 1992 to 1996 from 1.1 to 1.3 mill m³, resulting in harvesting percentages of 54 to 60%. At present an average of 60% of the growth is harvested (private owners 74%, state forest service 54%, conservation organisations 60%). The standing volume in Dutch forests is likely to increase in the coming years as a result of the increased nature conservation objectives in the forests (Schmidt 1999, p. 237-238).

The functions of forests have changed and increased during recent years in the Netherlands. Earlier, forests had limited functions: wood production, stabilisation of sand dunes and, for a small group of estate owners, prestige and hunting. Nowadays forests serve a multiplicity of functions: outdoor recreation, timber production, natural values and landscape quality. Recreation and amenity have become more important forest functions than timber production. Recreation has assumed massive dimensions, up to 10 000 visits/ha of open-access forest per year (Schmidt 1999, p. 235; van Kreveld 2000).

Urban forests in the Netherlands are increasingly important as leisure time and affluence grow and demand for various recreational and other uses of urban forests develop. In contrast to rural forests, urban forests are located in or nearby densely built-up areas, have a high level of recreational facilities, and are diverse in ownership and small and fragmented in scale (Konijnendijk 1997, pp. 52-53).

41% of the forests are in private hands, 31% are state owned, nature conservation bodies own 16% and local authorities and other public organisations 11%. For most private owners forestry is not their main means of livelihood; rather forests are kept as part of estates or as an outdoor recreation area for the family. The private forests are small in size – about 45% of the private forests are 0.5-5 ha and only 18 owners have a forest area over 500 ha (Schmidt 1999, p. 233-234; Wiersum and van Vliet 1999, p. 178).

5.10.2 Forest policy

The Ministry of Agriculture, Nature Management and Fisheries and its Department of Nature Conservation, Forestry, Landscape Planning and Wildlife Management are in charge of forestry issues. The legal basis for forestry is the Forestry Act (1922). The act has been a major instrument in preventing the conversion of forests to other land uses. In many cases, if the use of the forest land is changed, the same area of forest has to be planted elsewhere. The Town and Country Planning Act and the Nature Conservancy Act provide supplementary protection of important forest areas. The Landscape Act stimulates forest management and afforestation on estates to ensure aesthetic and recreational values (Schmidt 1999).

Social attitudes and their changes since the 1950s have been more influential in the Netherlands in steering forestry development and forest policy changes than market forces. The social trends that have had a major impact on forestry development include the increased importance of recreation and tourism, an increased appreciation for nature, and a growing environmental consciousness. The increased attention to democratic decision-making and decentralisation of governmental action has resulted in increased stakeholder involvement in forestry. In the forestry planning process the demands and needs of both the forest owners and the relevant stakeholders are taken into account. Ownership and management styles have also diversified and forest policy instruments are gradually changing to meet the different needs of the forest owners (Schmidt 1999, p. 248-249).

The forest policy issues arising from social trends can be distinguished as:

- a changing role of forestry in land use
- a diversification in the functions of forests
- interactive policy making

The rural areas in the Netherlands are becoming multi-functional rather than being just areas of agricultural and forestry production. Multi-functional use of land requires integration of forestry and other activities (agriculture, tourism, recreation, and nature conservation). As a result, forestry is increasingly incorporated within the context of nature conservation. Within the National Forest Policy Plan it is also explicitly formulated that forest policy is connected to several other policy fields, including land use and landscape planning, agriculture, environment, nature, water and recreation (Schmidt 1999, p. 249).

There are two major forest policy statements in the Netherlands, the Long-term Forestry Plan of 1984 and the Forest Policy Plan of 1993. Policy priorities up to the year 2020 have been formulated as follows (Schmidt 1999, p. 245; Natural resources 1997; FAO Forestry 2002; ITTO Newsletter 2002):

- sustained conservation of the present forest area and its further development on the basis of ecosystem zonation
- promotion of forests' multiple functions with respect to outdoor recreation, nature values, timber production, landscape quality and environmental quality
- expansion of the forest area by 75 000 ha over the period 1994-2020; 10 000 ha should be located near cities and in peri-urban areas. Afforestation on abandoned agricultural lands is also promoted (30 000 ha should be restored

on agricultural lands). The government aims to expand the forest area to 400 000 ha by 2020. The forests near areas with high population density serve as recreational areas and buffer zones against unplanned urban expansion.

- focus on a market approach and budget efficiency
- promotion of involvement of non-governmental organisations and private parties in forestry development
- contribute to sustainable forestry worldwide
- the government aims to raise the self-sufficiency of wood production to 25% in 2050 (from the present 8%)
- an effort to increase the proportion of mixed and broadleaved forests

5.10.3 Protected forests

The area of strict forest reserves in the Netherlands is 3030 ha (0.9% of total forest cover) and the area of all protected forests is 18 500 ha (5.5%) (Parviainen et al. 2000).

The government's policy document for nature, forest and landscape (July 2000) sets out the Dutch nature policy up to 2010. The central theme of the document is nature for people and people for nature, implying that nature should meet the demands of society and should be within easy reach, accessible and usable and at the same time nature should be protected, managed, cultivated and developed by people. One of the targets of the policy is the continuation and further realisation of the National Ecological Network. Since 1990 the aim has been to increase the amount of land designated as nature areas by 40% through the creation and extension of the network. The aim is to have in place, by 2020, a coherent network of valuable nature areas, which will form the ecological and recreational backbone of the country. Where possible new areas will be designated for the network with the objective of interlinked nature areas. The area of the network is not strictly protected as multifunctional uses of the area in the network are possible, provided these are not in conflict with the objectives of the network (Nature for people 2000; Nature Balance 2001)

The forest policy of long-term conservation and further expansion of forested area to more than 400 000 ha in 2020 will be continued. Instead of creating additional woodland outside the National Ecological Network, the focus will be on creating urban green space networks around the cities. At least 70% of the present woodlands will remain in timber production at the current timber production level. 18% (60 000 ha) shall be primarily for conservation purposes and to be managed in a way that these forests contribute to maintaining and improving the ecological infrastructure of the Netherlands (Nature for people 2000; van Kreveld 2000).

5.11 Norway

5.11.1 Current situation

Forests and other wooded land cover 37% of the area of Norway. The share of agricultural land is only 4%. The largest single category is other land, 47%, which comprises land above the tree line and some other barren land. The total forested area of Norway is 12 mill ha, of which 60% is regarded as productive forests. The term productive forest land refers to land with a capacity to yield at least 1m³/ha/year of wood over a rotation. The forest area per capita in Norway is 2.7 ha (Svensrud 1999, pp. 257-258; GRID-Arendal 2001).

In the 1990s the forest area increased on the average by 31 000 ha/year or 0.4%/year. Forestry's share of GDP has dropped from 0.57% to 0.21% during the 1980-1998 period (Natural resources 2000; FAO Forestry 2002). The annual growth on

productive forestland is 21.1 mill m³. Both growing stock and annual growth have been increasing for decades in Norway. Since the first national inventory in 1930, a doubling has taken place. The annual drain from the forests is slightly more than 50% of the annual growth (Svensrud 1999, pp. 261-262).

Most of the productive forestland is in private, personal ownership (78%). There are a large number of forest owners and the size of the holdings is unevenly distributed. 60% of the forest holdings have 10% of the forest area, whereas 10% of the largest holdings have 60% of the area. A large proportion of the forestland is farm forest and 75% of the private forest owners actually live on the farm. Forest enterprises and other private companies own 7% of the forests and 15% are public forests. Of the public forests, 6% are common forests in local ownership, where the local people have extensive rights of use, 3% are municipal forests, 3% belong to the church and the rest are state forests (Svensrud 1999, p. 259).

The forest owner has exclusive right to the wood production and hunting functions of forests, but apart from that the public has free access to the forests for other activities. Outdoor activities are an important feature of Norwegian everyday life and forests are used by a great number of people for outdoor recreational activities such as hiking and skiing. Forests around the urban centres are especially intensively used. Picking berries and mushrooms is another activity, which is very popular in Norway (Svensrud 1999, p. 266).

5.11.2 Forest policy

The Ministry of Agriculture is responsible for the forest sector policy in general and the Ministry of Environment covers environmental issues in all the sectors. The highest authority in the forest sector is the Ministry of Agriculture, Division of Forestry. At the county level there is a County land board with professional staff and at the local level the responsible authority is the municipality. State and church forests are managed by the state owned company Statskog SF, which also manages large areas of land above the tree line and the national parks (Svensrud 1999).

Forest legislation in Norway dates back to 1891, when a law on forest protection was passed. The present Forestry and Forest Protection Act was enacted in 1965 (amended in 1993) and is the main legal framework for forest management. The aim of the law is to promote forestry and forest protection. Rational use of the forests should aim at yielding a satisfactory return to the owner and to ensure a stable supply of wood for industrial purposes. The role of forests as a source of recreation, landscape, natural environment for plants and animals, areas for hunting and fishing should be emphasised.

Central parts of the Forest law deal with regulations for harvesting and reforestation. Younger satisfactory forest must be treated with the aim of furthering the development of forest with regard to wood quality and quantity. In other forests thinning and felling must be done in such a way that future growth or regeneration is favoured. There is a general obligation to reforest or to establish new forest by natural regeneration on forestland within a reasonable time. Forestry authorities are empowered to take action to prevent logging and other forest operations, which may lead to permanent deforestation. All conversion of forests is strongly regulated by different kinds of legislation. Harvesting should be carried out with regard to the natural environment and recreation. The forest authority can impose duties on forest owners regarding the treatment of forests damaged by wind or fire or in order to prevent or reduce damages caused by insects and fungus. Special regulations are applied to protection forests, i.e. forests that have protective functions against landslides, erosion or floods (Svensrud 1999, pp. 268-269; Earth Summit+5 2000).

Forest policy is closely related to environmental, agricultural and regional policies. The aim of the policies is to help forestry contribute to rural development. Regional policy has had a strong influence on forestry policy as a large share of forests and forest industry are located in regions with unemployment and out-migration problems (Svensrud 1999, p. 270; Stortingsmeldinger 1998-99).

The forest policy was revised in 1998/99 and a new Forest Act is under preparation. Policies reflect the balance between economic, cultural, social and environmental functions of forests. The new act will also stress the responsibility of forest owners to manage their land and to take into account environmental considerations and international commitments (EFC Country national reports 2000).

5.11.3 Protected forests

A major challenge for Norwegian forest policy is to combine the intensification of forest utilisation with increasing environmental requirements. There has been an increasing need to conserve forests, including productive forests. In 1995 a total forest area of 200 000 ha had been reserved for conservation, a large share of which is located at high altitudes and in the far North. There is a national plan, which has now been implemented, for establishing forest reserves covering various types of coniferous forests and extending the area by 12 000 ha. About 1% of productive coniferous forests has now been reserved for conservation. Conservation of biodiversity has to be taken care of through regulation of forestry practices. National research programmes have been conducted concerning multiple use and environmental forestry. A more environmental profile for forestry has been announced in a governmental report, and the declarations and resolutions of the international conferences on forest protection have been taken into account (EFC Country national reports 2000).

The forest area under strict protection in Norway is 148 000 ha and the area classified as protection forest is 199 500 ha (1.7% of forest cover). All forestry activities are prohibited in the strictly protected areas. The protection forests are situated mainly close to mountain ranges and the coastline. Significant restrictions are placed on forest operations in the protection forests but they are not totally preserved and about 50% of them are classified as productive forests. Other forests subject to restrictions cover 0.2 mill. ha. These areas include the forests surrounding the city of Oslo and special landscape conservation areas. The parliament decided in 1996 to expand the protection area of coniferous forest by 12 000 ha (Ministry of Agriculture and Forestry 2002; Parviainen et al. 2000; The Forest in Norway 2002; Living Forests Norway 2002).

5.12 Portugal

5.12.1 Current situation

Forests cover 3.666 mill.ha or 40% of the total land area of Portugal while agricultural land covers 43%. Plantations form a large area of Portuguese forests, in 2000 the plantation area was 834 000 ha. The forest area per capita is 0.4 ha. The forests are composed of 44% conifers and 58% broad-leaved forests. Eucalyptus forests cover over 600 000 ha (19% of the total forest area) and pine forests about 1 million ha (32% of the total forest area) (FAO Forestry 2002).

The forest area has been growing for the last 120 years. Until the 1950s there was a simultaneous growth of forest and agricultural lands, which was possible due to the large amounts of deforested and uncultivated lands. The agricultural

land area decreased during the 1960s and 1970s due to large scale rural emigration. In the 1990s the forest area grew significantly, the average annual increase was 57 000 ha or 1.7%. The forest area increase lately has been due to natural regeneration, restructuring of grazing and planting of burned land and uncultivated and marginal agricultural land. Forest fires are the main cause of deforestation. The main pressure leading to a shrinkage of forestland occurs in coastal areas, where the competition of tourism and urban expansion is greatest. The fragmentation of forest properties, absenteeism of forest owners because of rural migration, and the high level of forest fires are the main obstacles to effective afforestation and reforestation (Natural resources 2000; Carvalho Mendes 1999, pp. 297-298; FAO Forestry 2002).

The net annual increment per hectare in productive forests is 4.6 m³ for pine and 9.0 m³ for Eucalyptus. The relatively small figures are due to poor management of the pine forests and old age and multiple use of the broad-leaved forests. The annual fellings are almost as great as the net annual increment in the forests for wood supply (Carvalho Mendes 1999, p. 301).

The main function of the Portuguese forests is wood production (56%). The second largest function (42%) is production of non-wood forest products, mostly cork oak. The Forest Services issue hunting permits, about 300 000 yearly (Carvalho Mendes 1999, p. 305).

The major threat to Portuguese forests is fire. The annual area damaged by fire varies from 8500 ha to 87 500 ha. The total area of forest stands damaged by fire from 1968 to 1997 is 1.174 mill ha. The emigration from rural areas in the 1960s and 1970s worsened the problem, as the traditional uses of forests and minimum management standards ceased to exist. Current poor management practices are amplifying the factors caused by meteorological conditions (Carvalho Mendes 1999, p. 301).

A major part of the forests are in private ownership (83%) and the rest are almost entirely communal forests managed by the Forest Services. The public forests are mainly coniferous plantations. The private forest ownership is highly fragmented, especially in Northern and Central Portugal. A significant part of the private forests is integrated into farmland (Carvalho Mendes 1999, pp. 297-298; Natural resources 2000).

5.12.2 Forest policy

The Ministry of Agriculture, Rural Development and Fisheries is responsible for forest policy in Portugal. It has one central service, the Directorate General on Forests, and seven regional units integrated in the Regional Agriculture Departments. The Forest Services were created in 1824 to manage the public forests. In the beginning the Forest Services belonged to the Ministry of the Navy, a legacy from the time when wood supply to the shipbuilding industry was important. In 1886 the Forest Services were integrated into the Directorate General of Agriculture, where it has remained ever since (Carvalho Mendes 1999, pp. 295-297; Directorate General on Forests 2002).

A new Forest Policy Act was approved in Portugal in 1996. One of the main principles of the Act is that forest resources and associated natural systems must be managed sustainably within the integrated rural development framework. The forest policy principles are:

- forests are a multi-functional resource which should be managed in a sustainable way
- sustainable forest management should reconcile expansion of forest area, productivity improvement and biodiversity preservation
- protection of forests is a responsibility of society
- private forest owners are the major stakeholders in sustainable forest management

- the preparation and implementation of forest policy measures should be a participatory process
- forest policy should be integrated into the other policy areas and international initiatives the country is committed to should be taken into account.

The major forest policy tools are (Carvalho Mendes 1999, p. 308; EFC Country national reports 2000):

- regional forest management plans
- compulsory management plans for forest units over a certain threshold size
- definition of a National Forest Authority responsible for the preparation and implementation of forest policy and management of state forests
- creation of an Inter-ministerial Forest Commission
- creation of a Forest Consultative Council of major stakeholders, whose task is to propose new policy measures, analyse the existing ones and to approve and evaluate the implementation of the policy measures
- creation of a national, regional and subregional structure for fire prevention
- provision of financial incentives to forest owners
- creation of a forest fund and tax incentives for the development of forest production, improvement of the forest land ownership structure, compensation of biodiversity preservation, and forest research and training

The Plan for Sustainable Development of the Portuguese Forests (PSDPF) 1999 and other forest policy instruments constitute the national forest programme of Portugal. The Land Use Act defines the policy of land management and urbanization. Land use management plans allocate available land to forest use. Forestry planning is done by regional and state level forest management plans. They integrate all aspects of the multiple uses of forests (Natural resources 2000).

The Plan for the Sustainable Development of the Portuguese Forest sets productivity improvement targets:

- improvement of 70 000 of pine forests, 20 000 ha of cork oak, 5000 ha of Holm oak and 2000 ha of other broad leaved species per year
- raising the annual increment of eucalyptus by 1 m³/ha/year up to 2008

The Plan sets a target of 2% annual growth of the forest area until 2010, mostly maritime pine (15 000 ha/year), cork oak (10 000 ha/year) and other broad-leaved species (10 000 ha/year) (Carvalho Mendes 1999, p. 310).

The Plan also sets targets for fire protection: a 20% reduction in the burnt forestlands in 1998-2003 and a 50% reduction in the period 2003-2008 compared to the period 1992-97 (the average during 1990-97 was 130 000ha). The Plan also sets targets for building forest management capacity and capacity in forest related services, creating a sustainable forest management certification system and protecting biodiversity (Carvalho Mendes 1999, pp. 310-311).

The major impact of EU forest and forest related policies in the Portuguese forest sector has been the funding of afforestation programmes. Programme of Afforestation of Agricultural Lands in 1994-1999 approved an average of 26 000 ha of afforested land per year. The EU rural development programme for Portugal names afforestation of agricultural land as one of its priorities (European Commission 2000; EFC Country national reports 2000).

5.12.3 Protected forests

The nature protection legislation in Portugal was revised in 1993. The protection areas were then divided into seven categories. Protected areas cover 566 000 ha or 6% of the total land area. Most of the protected areas are forests (560 000 ha) and the majority of the protected areas are so called nature parks (76% of all protected areas). There are only 2 872 ha of strictly protected forest areas or 0.1% of the forest area.

The Plan for the Sustainable Development of the Portuguese Forest (PSDPF) (1999) has as one of the strategic orientations to preserve nature and valorise the environment in forest areas (Ministry of Agriculture and Forests 2002; Portugal national report 2000; Parviainen et al. 2000; Market Statement Portugal 2000; Ministry of Agriculture and Forests 2002).

The main goals of the National Strategy for the Conservation of Nature and Biodiversity (2001) include:

- to construct a principal network of nature conservation and a national system of classified areas, integrating this to a national network of protected areas
- to promote amelioration of the protected areas and ensure the conservation of natural, cultural and social assets
- to ensure the conservation and amelioration of natural resources in the areas and sites protected in the Natura 2000 network.

The forestry sector objectives include:

- identification and conservation of the areas most susceptible to erosion
- development of silvicultural practices suitable to erosion-prone areas
- protection of the biodiversity and landscapes
- development of silvicultural practices and land use models suitable for protected forests and production forests.

5.13 Spain

5.13.1 Current situation

Forests cover approximately 28% of the total land area of Spain. The total wooded area is 13.9 million ha according to the Second National Inventory. The national forest programme (Plan Forestal Español 2002) gives a much higher figure for the forest area: 26 mill. ha. The forests in Spain are mostly located in the mountains in the northwest. The dominating species are elm, beech and chestnut. Forest plantations (areas of reforestation with fast growing tree species) cover 13% of the forest area, 1.925 million ha. The forest area per capita is 0.4 ha.

Spain has had an intensive programme of reforestation since 1940. The total area reforested can be estimated as 3.7 mill ha by 1986 and up to 4 mill ha by 1999. In the 1990s the forest area increased annually by 86 000 ha on the average (0.6% rate of increase). This number includes both afforestation and improvement of degraded or deforested forest areas. The area subjected to forest fires has been on the average 68 300 ha/year (Madrigal et al. 1999, p. 382; FAO Forestry 2002; EFC Country national reports 2000; Ministerio de Agricultura...2002).

Approximately 80% of the wood produced in Spain comes from fast growing species. Other forest products include fuel wood, cork, resin, chestnuts and mushrooms. Important forest functions are using forests as pastures, hunting and recreational use. (Madrigal et al. 1999, p. 386)

5.13.2 Forest policy

Spain has an almost federal structure with 17 Autonomous Communities (Table 3). These have had responsibility for forest management and forestry development activities since 1986. The State has the following responsibilities in the forestry sector (Madrigal et al. 1999, p. 380):

- international relations and representation in the EU
- airborne fire-fighting
- forest inventories

- National Parks
- large-scale subventions and investments
- taxation
- forest and nature protection frame law

The basic forest legislation is limited to two principal laws: Forest Law 1957, and Framework Law of Conservation of Natural Areas and Wildlife 1989. Seven Autonomous Communities have forest laws and regulations of their own: Andalusia (1992), Catalonia (1988), Extremadura (1998), Madrid (1995), Navarra (1990), La Rioja (1995) and Valencia (1993) (Madrigal et al. 1999; Cirelli and Schmithüsen 2000).

The Ministry of Environment released the first national forest strategy of Spain in 1999. The key proposals of the strategy concerned plans to increase reforestation, especially in areas suffering from erosion or areas at risk of desertification (Natural resources 2000).

The Ministry of Environment published the first national forest programme of Spain in July 2002. The objectives of the programme include (Plan Forestal Español 2002):

- promotion of protection of the forest area in general and the mountain areas in particular
- promotion of action against erosion and degradation of soils
- increasing the forest cover for the purpose of soil protection and erosion control
- sustainable management of forests in the mountains taking into account the multiple functions of forests
- forest fire prevention
- conservation of biodiversity and landscape
- favouring the recreational use of forests and rural tourism

The national forest programme (Plan Forestal) estimates that the rate of afforestation of agricultural lands in Spain can be somewhat higher than during the previous afforestation programme (up to 1994). Then the rate of afforestation was 85 000 ha/year (Plan Forestal Español 2002).

Table 3. Forest area in the autonomous communities of Spain

Community	Thousand ha	% of total geographic area
Andalusia	2,106	24.1
Aragon	1,185	24.9
Principado de Asturias	368	38.8
Islas Baleares	122	24.8
Canarias	105	14.0
Cantabria	166	31.3
Castilla-La mancha	1,851	23.4
Castilla y Leon	2,119	22.5
Cataluna	1,319	43.7
Comunidad Valencia	628	27.0
Extremadura	1,457	35.0
Galicia	1,045	35.5
Madrid	196	24.4
Region de Murcia	269	23.8
Navarra	373	35.8
Pais Vasco	390	53.8
La Rioja	129	25.6

EU forest policies in Spain are indirect policies such as protection and promotion of the cork sector, the LIFE programme and measures accompanying the CAP reform. The afforestation of agricultural lands within the EU programmes has been one of

the main instruments for increasing forest cover. The EU-supported horizontal rural development programme 2000-2006 for Spain again has afforestation of agricultural land as one of the priorities for action. The measure will help combat soil erosion and desertification, and to diversify agricultural production on holdings. The target is reafforestation of 150 000 ha of agricultural land. Some of the Autonomous Communities have their own rural development programmes for the same period, 2000-2006 (Ministerio de Agricultura...2002, European Commission 2000).

The rural development programmes 2000-2006 of the Autonomous Communities include the following forest measures (European Commission 2000):

- Catalonia: afforestation of agricultural land and prevention of forest fires
- Rioja: extending tree cover
- Madrid: afforestation
- Navarre: reforestation, creation of protected areas, preventive forestry
- Basque county: reforestation, restoring damaged forest areas, afforestation of agricultural lands and forestry treatments to preserve environmentally important woodlands. The agricultural area to be afforested is 28 350 ha and 57 000 ha of other forests are to be treated.

5.13.3 Protected forests

Most of the forests in Spain have been changed by heavy human influence. Natural forests remain in the mountain regions, but there are at most 30 000 ha (0.2% of total forest area). Mainly during the last 15 years, 489 nature protection areas have been established in Spain. These protected areas cover 2.9 mill ha. ha (6% of the total land area and 24% of forest cover). About one-third of the areas have been established to protect the forest environment. The area of strictly protected forest reserves is 32 600 ha (0.3% of total forest cover) (Ministry of Agriculture and Forests 2002; Parviainen et al. 2000).

The national forest programme of Spain (2002) lists primary actions including:

- realisation of silvicultural practices to improve ecological level and biodiversity of forests
- establishment of experimental networks of biodiversity management forests especially in the areas included in Natura 2000 network
- protection of the mountain forests against changes that endanger their conservation and sustainable management as well as their ecological and socio-economic characteristics

The main efforts of the Spanish government concerning protected forest areas have been directed towards closing gaps in the National Parks Network and implementing the Natura 2000 Network and the Spanish Biodiversity Strategy. The Natura Network will cover 17.4% of the land area of the country and at least 25% of the forest area when implemented. Depending on the definition of forest covered area, the increment of protected forest areas would be from 125 000 to as much as 3 mill. ha (Sollander 2000).

5.14 Sweden

5.14.1 Current situation

Approximately 65% of the land cover of Sweden is forested, a total of 27 million ha. During the 1990s changes in forest cover were not significant in Sweden. Forests are primarily coniferous, and contain mostly spruce and Scotch pine. In southern Sweden there are deciduous forests containing oak and beech (Lundkvist et al. 1999; FAO Forestry 2002).

The gross annual increment of the forest resource is approximately 100 mill m³, while the potential harvest is in the order of 80 mill m³ in the short run and 90 mill m³ in the long run. The actual gross harvest is in the order of 70 mill m³ (Lundkvist et al. 1999).

Sweden is one of the biggest timber producers in the world. Exports of forest products account for around half of the net export earnings and the self-sufficiency rate for forest products is almost 300%. Most lumber comes from the Småland region and the northern highlands (FAO Forestry 2002; EFC Country national reports 2000).

Productive forests cover about 57% of the total land area and the total forest and other wooded land area is 28 mill ha. 10% of forests are owned by state or public agencies, 39% by forest companies and 51% by individual private owners. In 1993 the principal parts of the state forest and the State Forest Industry Company were merged into a new company, Assi Döman. Slightly less than 50% of the shares were sold on the market. Before the establishment of Assi Döman, the share of state forests was 20% of total forest area (Lundkvist et al. 1999, p. 404, 408).

5.14.2 Forest policy

The National Board of Forestry was created in 1941. Regional Forestry Boards implement forestry policy. The County Forestry boards were organised under a regional office in 1981; previously they were rather independent. The state forests are subject to the control of the County Forestry Boards under the supervision of the National Board (Lundkvist et al. 1999, p. 409).

During the 1980s, forest policy centred on wood production became widely criticised in Sweden and around 1990 customers and consumer organisations in Europe questioned the true sustainability of Swedish forestry. It became clear that to run forestry with both high production and maintenance of biodiversity, it would be necessary to integrate production and biodiversity questions in forest planning. Forest planning needed to be on the landscape level; the stand level is too small-scale to address the problems of biodiversity. To preserve biodiversity, the landscape must be managed both by means of a static part such as non-harvested nature reserves and a dynamic part, which may encompass a system of patches in different successional stages (Lundkvist et al. 1999, p. 406).

The new Forest Act in Sweden was promulgated in 1994. The act includes provisions on the obligation of forest owners to establish new stands on forestland where appropriate, and provisions on felling. A specific part deals with selected valuable broad-leaved forests, requiring that such forests be permanently maintained and regenerated. The new law gives more freedom of action in land management to the forest owner than the previous law. In the new law environment and wood production are considered as policy objectives of the same priority and of equal weight in managing forest resources (National Board of Forestry 2002).

Forest owners are responsible for environmental measures required on land used for timber production and have to bear the related costs. The Forest Act requires that felling on forestland must be performed in order to promote the establishment of a new stand, or to benefit the development of the existing stand. The government may specify the maximum percentage of forest holdings that can be felled during a given period (National Board of Forestry 2002).

The share of deciduous trees is estimated to increase from less than 16% of the total standing volume to about 17-18% by 2010 and to 18-25% by 2100. The shares of Scots Pine and Norway Spruce will decrease at the same time. The share of Scots Pine diminishes mainly in southern Sweden and that of Norway Spruce in northern Sweden. It is estimated that the share of old-aged forests will grow from 4.5% in 2000 to 7.5-10.5% by 2100. This increase is greater in southern Sweden (Gustafsson and Thuresson 2001).

The Swedish forest policy has two equal goals, relating to the environment and to production. The environmental goals include (National Board of Forestry 2002):

- protection of forests' natural productivity
- ensuring forests' biological diversity and genetic variation
- utilising forests in a manner that permits natural flora and fauna to live in their natural surroundings
- protection of threatened species and biotopes
- preserving the cultural and aesthetical, and social values of forests

The production goals include:

- forests and forest lands have to be used effectively and responsibly so that the production is sustainable
- the forest owners have increased freedom to manage their forests within the framework of the Forest Act

5.14.3 Protected forests

The total area of protected forests in Sweden is 3.7% of forest cover or 832 400 ha. The area of strictly protected forests is 576 000 ha or 2.5% of the total forest cover (Parviainen et al. 2000).

In 2001 the Parliament introduced 15 environmental goals. Within the main goal of "Living forests" the following interim targets were presented:

1. A further 900 000 ha of forest land in need of protection will be excluded from forest production by the year 2010
2. The amount of dead wood in forests, the area of forest with a high proportion of deciduous trees and old-growth forest will be maintained and increased by 2010 by:
 - increasing the quantity of hardwood by at least 40%
 - increasing the area of established forest with a high proportion of deciduous trees by at least 10%
 - increasing the area of old-growth forest by at least 5%
 - increasing the area regenerated with deciduous forest
3. The management of forest land in such a way that it does not damage ancient monuments, and by 2005 action programmes will be under way for endangered species (National Board of Forestry 2002; The Swedish Environment Protection Agency 2002; Regeringens miljö kvalitetsmål 2002).

The main target of living forests should be reached within a generation (in 2020). Up to 2010 400 000 to 500 000 ha of forests shall be protected, partly state forests and partly private forests by voluntary arrangements. 320 000 ha shall be nature reserves, 30 000 ha biotope protection areas and 50 000 ha by nature protection agreements (Sveriges miljömål 2002).

5.15 Switzerland

5.15.1 Current situation

Forests cover 31% of the Swiss territory (1.260 mill. ha). The forest area per capita is 0.2 ha. Forest is defined as an area of minimum width of 25-50 m, a cover of 20% and minimum height of 3 meters. Almost half (42%) of the forests are on slopes with a gradient greater than or equal to 40% (Schmithusen and Zimmermann 1999, p. 419).

In the past 100 years the forest area of Switzerland has increased by nearly 40% and continues rising. Between 1985 and 1995 (National Forest Inventories 1 and 2) the forest surface of the country increased by 48 000 ha or 4%. In the 1990s the forest area increased approximately by 4000 ha/year (0.4%). The forest has expanded mostly in mountainous regions as abandoned pastureland is afforested. The annual increment of the Swiss forests is considerably more than is actually harvested. The low rate of exploitation can be explained by difficult access to forests in mountain regions, high logging costs and comparatively low wood prices. There is also an increase in older and thicker trees in the forests, which runs counter to the demand of the Swiss sawmill enterprises for younger to medium-aged stems (EFC Country national reports 2000; Swiss Agency for the Environment 2001; FAO Forestry 2002; Facts Forest and Timber; Forests for Future...2001).

In comparison with other European countries the growing stock volume per hectare in Switzerland is exceptionally high, the average volume being 362 m³/ha. The mean annual increment is 8.3 m³/ha. Rates are higher in the Pre-Alps and the Plateau (10.4 m³/ha and 12.3 m³/ha) and lower in the Alps (5.7 m³/ha). The total annual growth volume of the forest of 9.8 million m³ exceeds the combined volume of removals and natural losses of 7.2 million m³ by 30% (Schmithuisen and Zimmermann 1999, pp. 421-422).

Forestry is not an important sector in the Swiss economy at only 0.1% of GDP. This is due to the rough terrain for harvesting and the high harvesting costs. The forests have an important function in Switzerland for protecting the environment and society from natural hazards like avalanches, floods and rockfalls. All forests are freely accessible to the public and their use for outdoor recreation has increased (Swiss Agency... 2002).

One third (326 000 ha) of the forests are privately owned by approximately 260 000 owners with an average forest area of 1.2 ha. Public forests comprise two-thirds of the total forest. 70% of the public forest enterprises own forest holdings less than 200 ha, and only 3% have holdings larger than 1000 ha. The structure of public ownership has many facets and is, in legal terms, relatively complex as a great variety of public institutions own the public forests. The historical communes of burghers, municipalities and corporations or co-operatives own more than 90%. The local communities developed as associations of burghers that had the right to share timber and pasture in certain forests around settlements. The tenure rights of these associations were recognised as full ownership in the 19th century. The public corporations own large tracts of predominately mountain forests. Compared with the three main categories of public forest ownership, the amount of forest owned by the cantons, the federal government and other public institutions is fairly negligible (Schmithuisen and Zimmermann 1999, p. 418; Kisslin-Näf and Zimmermann 1999, p. 271-273).

5.15.2 Forest policy

Switzerland is a federal state with a political structure at three levels: the Federal, the Cantons and the local Authorities. The forestry service is organized into two levels, the federal and the cantonal. At the federal level the Department of the Environment, Transport, Energy and Communications oversees the implementation of forest legislation and develops national forest policies and strategies. The Swiss Agency for the Environment, Forests and Landscape is part of the Department and is in charge of forest related matters. The federal level forestry organisation focuses on the protection of forestlands and on the protective role of forests in mountain areas. The federal authority must approve the canton's legislation. The cantons are responsible for implementing federal regulations. They also have a fairly large

domain of regional competences including forest management planning, support to public and private forest owners and organisation of the cantonal forest services (EFC Country national reports 2000; Cirelli and Schmithüsen 2000).

Starting in 1985, a total revision of the Swiss forest law took place. The new Federal Forest law has been in force since 1993. The law reacts to the changes in the role of forests in society and focuses on two central issues (Schmithuisen and Zimmermann 1999, p. 429):

- It aims at a balance between the interests and possibilities of forest owners, and the increasing and diversified interests of the forest users.
- It tries to establish an equilibrium between public demands and commitments in order to protect forest lands and to maintain a wide range of socially desirable forest outputs.

The law regulates clear felling and includes basic provisions on land use planning in areas that include forests. Particular emphasis is put on the conservation of biological diversity providing a framework for protection over the entire forest area. Silvicultural practises have to respect natural conditions, making allowances for the conditions of the site, natural flora and fauna and the landscape. Natural regeneration should be used whenever possible and planting has to be carried out with site-specific species. Clear cuts are prohibited (Cirelli and Schmithüsen 2000).

The law retains the principle of forest protection and conservation. It provides for a multi-functional sustainable forest management, which aims at protection from natural hazards, wood production, recreational and educational uses, landscape and nature conservation as well as forest sector development. Specific forests may be set aside by the cantons in order to maintain and conserve biodiversity. The law provides compensation to forest owners if they are required to carry out work or provide services of public interest at costs which cannot be covered otherwise (Schmithuisen and Zimmermann 1999, p. 429).

The conversion of forest for other uses is subject to strict rules on clearing practices, including rights to object. The Law on Area Planning and the Law on Forests only permit the conversion of forests or changes in their use when there is no other option as far as location is concerned, the clearing of forest does not involve serious risks for the environment and when such a measure is decidedly in the public interest. The law specifies that financial interests cannot be considered significant in determining the authorisation for forest clearing, the interests of protecting nature and landscapes must be respected, and that in any case such exceptions to the general prohibition must be temporary. No forested areas may be classified as building areas without prior authorisation by the forest authorities. Even after clear cutting or forest fires, the forest areas remain forest areas from the legal point of view and must be restored, although they may no longer effectively have a forest on them (Oettli 2000; Cirelli and Schmithüsen 2000).

Since the first Federal Law on Forests came into effect for the whole of Switzerland in 1902, forested areas have enjoyed quantitative protection. In certain regions, Switzerland is today even confronted with the problem of forested areas increasing to an extent greater than would be desirable from the point of view of nature conservation. The distribution of land uses is considered to be adequate and Switzerland is not planning to enlarge its forest area. The protection of biodiversity is intensified in the existing forests (Oettli 2000; Natural resources 2000).

5.15.3 Protected forests

The area of strict forest reserves is 1 018 ha or 0.08% of total forest cover in Switzerland. The total area of protected forests is 13 530 ha or 1.1% of total forest cover. 39% of the protected forests are situated in the Swiss national park, which is the only national park in the country (Parviainen et al 2000).

The federal government has no clear commitments to increase protected areas but a certain amount of effort to increase protected forest areas at the canton level is being deployed: Guidelines for Protected Areas are encouraged, cantons receive financial allowances for measures to promote and install protected areas, providing they have drawn up cantonal concepts for such protected areas. There are federal and cantonal efforts to increase the share of strictly protected areas. However, the achievement of the targets of the Gap analysis would take 49 more years with the past and current rate of protection in Switzerland (Oettli 2000).

The Federal Board of Forestry (l'OFEPF) has begun research concerning the potential of forest reserves of Switzerland and has proposed certain qualitative and quantitative objectives for the cantons. The time scale for the objectives is 30 years (up to 2030). The objectives include (Swiss Agency... 2002):

- the Cantons should take special cognisance of rare forest types and endangered species
- all Cantons should establish several large reserves of over 5000 ha (with a minimum number of 30)
- protection of biodiversity is particularly encouraged

5.16 United Kingdom

5.16.1 Current situation

The three nations of Great Britain – England, Scotland and Wales – and the province of Northern Ireland constitute the United Kingdom. In Great Britain, 75% of the total land area is agricultural land and 10% productive forest. The total area of forest and other wooded land in the UK is 2.3 mill ha. Around 69% of the total forest cover is plantations. The forest cover has increased during 1950-1990 at an average of more than 30 000 ha/year, but during the 1990s the mean rate of expansion had fallen to 18 000 ha/year (Price and Samuel 1999, pp. 463-464; Parviainen et al. 2000).

In the UK there is no clear definition of “forest”. It is often used to indicate extensive areas, which are (normally) tree covered for the purpose of timber production, as distinct from small, multipurpose “woodlands”. The statistics refer to tree-covered area as forest irrespective of size and purpose. The forest cover of Britain (11% of the land area) is unevenly distributed: only 8% in England, 12% in Wales and 16% in Scotland. The forest area is 0.04 ha/capita, which is very low by world standards (Price and Samuel 1999, pp. 463-464).

The estimated UK growing stock volume is about 273 million m³ (1997), or about 110 m³/ha. There has been a 50% increase in volume since 1950 mainly for two interconnected reasons: 1) there has been a 30% increase in the forest area in the UK since 1950 and 2) much of this area was planted with coniferous species and is now reaching its greatest mean annual increment. Average increment is 10-12 m³/ha/year for conifers and in the range 4-12 m³/ha/year for broadleaves (Price and Samuel 1999, pp. 465-466).

5.16.2 Forest policy

Forestry has become a devolved matter in the UK. For forestry matters affecting the UK as a whole, the Department for Environment Food and Rural Affairs has taken over responsibility from the previous Ministry of Agriculture, Fisheries and Food. The Department has responsibility for forestry in England, the Scottish Executive has responsibility for forestry in Scotland and the Welsh Assembly in Wales. The Forestry Commission and the Northern Ireland Forestry Service are the Government

departments responsible for advising the UK forestry ministers on policy and implementing it. The Forestry Commission remains a Great Britain cross-border Government department serving all three countries. In Northern Ireland there is a separate Forest Service within the Department of Agriculture for Northern Ireland (Price and Samuel 1999, p. 472; Miller 1999, p. 120).

The primary concern of the British forest policy after World War II was to build up a strategic reserve of timber, and forest expansion was geared to timber production. Until the 1980s no serious policy challenge existed to the primacy of timber production. The UK's forest policy is of a rather informal kind, though occasionally specific Forestry Acts of Parliament are promulgated (the last in 1967). There has been a movement towards a multiplicity of objectives, driven largely by more general legislation. There is the UK Sustainable Forestry programme (1994), which is a national forest programme for the UK. Changes in the Common Agricultural Policy as a consequence of over-production of food have strongly redirected the UK's forest expansion on agricultural land. Following the 1993 Ministerial Conference on the Protection of European Forests in Helsinki, the Government formally adopted a forestry policy to promote sustainability.

Sustainability was expressed in the following terms:

- sustainable management of existing woods and forests
- a steady expansion of tree cover to increase the many diverse benefits that forests provide

The UK Forestry Accord was adopted in 1996 by many business and environmental organisations in the UK. Its summary principles are (Price and Samuel 1999, pp. 472-476):

- forestry is a uniquely sustainable land use and investment in all types of sustainable forestry should be encouraged
- conservation of biodiversity and natural resources should lie at the heart of forest management
- forest management should safeguard and enhance landscape and heritage resources
- sustainable productive forestry to provide timber benefits should be encouraged
- research, education and training should cover all aspects of sustainable forestry the public should be widely involved in and consulted in forestry matters

The main instruments for afforestation in the UK are the Woodland Grant Scheme and the Farm Woodland Premium Scheme. Afforestation still predominates on land unsuitable for agriculture, although the situation is slowly changing. It is acknowledged that afforestation should be concentrated on better land, both for the establishment of forests around urban areas and for improved production levels. However increasing lowland afforestation is considered to be a longer-term proposition. The Government's over-arching policy theme is "Right trees in the right place". There are policy goals promoting the establishment of new semi-natural forests, including urban forests in areas of high population density, and guidelines on creating new native woodlands by promoting the use of local provenances (Richardson 2000).

Quantitative goals have been set by the central government for the expansion of new native woodland in the UK through Habitat Action Plans (eventually amounting to around 30 000 to 40 000 ha). There are no targets for commercial conifer afforestation. The Forestry Commission's Home Grown Timber Advisory Committee has published suggested targets for the establishment of various types of woodland in the UK. It indicated its support for emerging targets, suggesting 5000 ha/year via Habitat Action Plans, 100 000 ha new urban woodlands over the next 20 years, new conifer plantings (initially 11 000 ha/year) and 11 000 ha

broadleaves/year with a longer term aim of an increase of 275 000 ha broadleaves. The broadleaf and urban forest target would account for approximately a 14% increase in UK woodland cover (Richardson 2000).

In the EU Rural development programmes 2000-2006 the area under forestry is set to increase through payments for planting trees on agricultural and non-agricultural land and compensating for income losses on farm woodlands (European Commission 2000).

The UK Forestry Standard (1998) gives the criteria for sustainable forest management in the UK. One of the criteria is nature conservation in and around forests. Biodiversity in and around woods and forests is conserved or enhanced by restoring important but previously disturbed semi-natural habitats and conserving or enhancing species and habitats subject to EU Directives and UK Biodiversity Action Plans.

In the next sections the forest policies and characteristics of England, Scotland, Wales and Northern Ireland are presented.

5.16.3 England

Current situation

Forestry and woodlands cover 8% of the land area of England. Planting trends over the past 20 years have ensured that young forests are relatively diverse, in particular those 10 years old or younger. Since 1985 conifer plantings under the Woodland Grant Scheme must have a minimum of 5% broadleaves and 10% open space for natural regeneration. Government policy also focuses on restructuring of plantation forests to introduce a greater diversity of structure. Conversion from plantation to semi-natural woodland is encouraged as an option on ancient woodland sites. The economic value of woodlands is often low, but they generally have high environmental value. Three hundred million recreation visits are made to England's woods and forests every year. (European Commission 2000; Richards 2000).

The Forest Service has carried out forest inventories in all the counties of England (Figure 5) (National Inventory 2002).

Forest policy

England Forestry Strategy (1998) sets the priorities and programmes for forestry up to the year 2008. The strategy is currently under review. Forest policy in England has two main aims:

- sustainable management of existing woods and forests, and
- a continued steady expansion of the woodland area to provide more benefits for society and the environment

The strategy is based on four key programmes that are not mutually exclusive:

1. Forestry for rural development
2. Forestry for economic regeneration
3. Forestry for recreation, access and tourism, and
4. Forestry for the environment and conservation.

The actions set out under the programmes cover the short to medium term.

The programme of Forestry for Rural Development is concerned with the forestry's role in the countryside and its contribution to the rural economy and timber production. A priority is to encourage the creation of well-designed, larger woodlands than the small-scale plantations established during the past years. The planting of larger woodlands will be encouraged, particularly in areas where they can support local wood processing and marketing infrastructures. Planting smaller woodlands

will be supported, particularly in urban areas. Areas suitable for woodland creation also include derelict and despoiled land, and in areas where woodland would confer landscape improvement, recreational opportunities and provision of wildlife habitats.

The programme for Economic Regeneration encourages the planting of woodlands for restoration of former industrial land. Urban forestry is stressed along with the planting of woodlands in urban areas and the better care of existing trees. The Community Forests of England have developed an approach to managing the countryside around towns. The twelve Community forest partnerships will aim at increasing the wooded cover of their areas to an average of 30%. Over a half of England's population live within 16 km of the community forests.

The programme for Recreation, Access and Tourism aims to provide more and better-quality access to woodlands. The priority of the programme is to secure greater access to the open countryside and especially to mountain, moor, heath, down and registered common land.

Over 20% of England's woodlands are of ancient and semi-natural origin. A priority of the programme for Environment and conservation is creation of new woodlands for revising the fragmentation of the existing semi-natural woodlands. Locally native trees and shrubs should be used for planting. It should also be ensured that woodlands are not converted to other land uses.

Felling in England, Scotland and Wales is strictly controlled through a system of felling licences. As from August 1999, those in England and Wales wishing to fell trees covered by a Tree Protection Order or trees in a Conservation Area must apply for a licence to the Forestry Commission. The Forestry Commission permits conversion in appropriate cases (e.g. to non-woodland native habitat), but does not generally permit the felling of trees to clear land for agriculture. Safeguards are imposed to ensure that the proposed conversion is part of a Habitat Action Plan or Biodiversity Action Plan with which the appropriate natural heritage agency is in agreement (Richards 2000).

Protected forests

In England there are 79 800 ha of woodland areas under statutory protection (area of special scientific interest) (Forestry Statistics 2001). There are no natural forests left in England, but over 20% of the woodlands are of ancient (woodland which has been in continuous existence since 1600) and semi-natural origin. The targets of the Forestry Commission for 2004 are to increase the area of ancient semi-natural woodland by 35 000 ha and to create 3000 ha of new native woodlands, both in accordance with the UK Biodiversity Action Plan.

The England Forestry Strategy (1998) aims at restoring semi-natural woodlands by reversing the fragmentation trend of woodlands and encouraging the creation of new native woodlands located to create more viable woodland units. The Forestry Commission introduced a new native woodland creation Challenge Fund for national parks in 1997. The first round of bids resulted in the creation of 460 ha of new woodlands in the English National Parks.

5.16.4 Scotland

Current situation

Forests in Scotland cover 1.2 mill.ha, which is over one-sixth of the land area, and account for half of all wood production in Great Britain. Scotland is mountainous and 84% of agricultural land is classified as Less Favoured Area, of which 98% is Severely Disadvantaged Area (European Commission 2000).

Forest policy

The Scottish Forestry Strategy (2000) has five strategic directions:

- to create a diverse forest resource of high quality
- to ensure that forestry makes a positive contribution to the environment
- to create opportunities for more people to enjoy trees, woods and forests in Scotland
- to help communities benefit from woods and forests

The objective of the strategy is to increase Scotland's forest area towards 25% of the land area by 2050.

Priorities for action of the strategy include (Scottish Forest Strategy 2000):

- improve competitiveness of the forest sector by developing a strong forest industries network
- develop timber transport infrastructure
- promote more use of timber
- expand the area of well designed productive forest
- improve timber quality through following good forest practice
- develop more mixed forests
- exploit non-timber outputs and benefits of woods and forests
- improve management of semi-natural woodlands
- extend and enhance native woodlands by developing Forest Habitat Networks
- increase the diversity of farmed landscape
- encourage alternatives for clear-cutting
- provide woodland recreation opportunities near towns
- increase forestry's contribution to tourism
- provide opportunities for greater community involvement in forestry

In the EU Rural development programme 2000-2006, forestry is a key component of agricultural diversification and also suitable for areas where land quality is relatively poor. The conditions for forest industry will be developed and the use of forests for recreation and tourism will be increased. New woodlands on agricultural land and natural regeneration of woodlands are encouraged (European Commission 2000).

Protected forests

The area of woodland areas under statutory protection in Scotland is 38 000 ha (Forestry Statistics 2001). The Scottish Forestry Strategy (2000) lists conserving the natural heritage and improving the environment as targets. New native woodlands are especially valuable if they are located where they expand and create links between existing native woodlands. The concept of Forest Habitat Networks has been developed to provide an ecological basis for planning woodland expansion. Forest Habitat Networks can enlarge and reconnect existing woods. The expansion targets for native woodlands in Scotland are (The Scottish Forest Strategy 2000):

- upland oak, 3000 ha by 2005
- native pine, 30 500 ha by 2005
- upland mixed ash, 2000 ha by 2015
- wet woods, 2 200 ha by 2015

National Planning Policy Guideline 14 – Natural Heritage states that planning authorities should seek to protect areas of woodland where they have natural heritage value or contribute to the character or amenity of a particular locality. Ancient and semi-ancient woodlands have the greatest value for nature conservation (Woodland Trust 2002).

5.16.5 Wales

Current situation

Forests cover around 13% of the total land area of Wales. The region has an attractive, high quality landscape and tourism is an established sector of the economy. In general population in the rural areas has increased but some remote areas have experienced population decline. Agriculture has declined in remote areas and alternative employment has not been generated. There is poor transport infrastructure in some of the rural communities (European Commission 2000).

Forest policy

Woodlands for Wales: forest strategy (2001) is planned to cover the period up to 2050. The vision of the strategy envisages Wales having high-quality woodlands that enhance the landscape, are appropriate to local conditions and have a diverse mixture of species and habitats. The principal objectives of the strategy are:

- woodlands for people
- a new emphasis on woodland management
- Wales as a location for world-class forest industries
- a diverse and healthy environment
- tourism, recreation and health

Programmes for action include (Woodlands for Wales 2001):

- Using forests as a social and cultural asset for some of the most disadvantaged communities. Actions to create new woodlands and plant on vacant industrial sites are encouraged.
- New emphasis on forest management. Actions include diversifying coniferous forests, creating mixed woodlands of more natural appearance, extending the woodland cover, and a strong case for moving away from single-aged plantations and the use of clear-cutting systems, and moving to continuous cover systems
- Appropriate sites for new trees and woodland. New woodlands could link and protect the remaining ancient semi-natural woodlands, provide shelter on farms, help diversify agricultural businesses and contribute to a sustainable supply of timber for industries. Restoration by planting forests in landscapes remaining after mineral extraction and other industrial activities is emphasized. Creation of forests in urban areas and the urban fringe is encouraged.
- Fostering the development of renewable energy based on wood.
- A diverse and healthy environment. Woodlands are created and managed to conserve and enhance the landscape and biodiversity and to better integrate woodlands with other countryside management. Enhancing and conserving the landscape means valuing trees for their high visual impact, enhancing the surroundings of urban and commercial areas by planting trees, restoration of mining and other industrial areas, restructuring existing plantations, and restoring natural vegetation when removing woodland.
- Promotion of woodlands as part of the setting for tourism development
- Promotion of health through access to woodlands for all communities. Actions include extending access to woodlands, particularly for disadvantaged communities, and using trees and woodlands in urban settings.

Felling is strictly controlled by a system of felling licences in Wales. The Forestry Commission issues felling licences and the system is identical to that in England (Richardson 2000).

Within the EU Rural development programme 2000-2006 separate grants are available for afforestation of agricultural land and for improving the economic, social and environmental values of existing woodland and forest. An integrated whole farm agri-environmental scheme is continuing throughout Wales. It comprises a series of habitats which farmers are obliged to manage according to set criteria including heath land, woodland and grasslands (European Commission 2000).

Protected forests

There are 8 900 ha of woodland areas under statutory protection in Wales (Forestry Statistics 2001). The Government has a broad intent to retain or increase the area and quality of protected forests through the mechanisms of designated areas, special focus on ancient woodlands within the Site of Special Scientific Interest (SSSI) series, and development of Woodland Habitat Action Plans. This intent has been most clearly articulated for England and Wales (Richardson 2000).

The forestry strategy of Wales, Woodlands for Wales, has among its priorities for action conservation and enhancement of the biodiversity of Welsh woodlands and landscapes. The objectives include increasing native woodlands, connecting existing woods and increasing the core area of native woodland habitats. No specific targets of protected forest areas are given (Woodlands for Wales 2001).

5.16.6 Northern Ireland

Current situation

Forests cover 6% of the land area in Northern Ireland. In agriculture, there is a heavy emphasis on livestock production (present on over 90% of the farms), particularly grazing livestock. Owner-occupied family farms with an average size of 34 ha characterize agriculture (European Commission 2000).

Forest policy

The EU Rural development programme 2000-2006 encourages diversification away from agricultural production. There is support for new woodlands on agricultural land by the Farm Woodland Premium Scheme. Incentives to increase the area under forest, including short rotation coppice on agricultural land, are provided by the Woodland Grant Scheme. The aim is to increase timber output and generate employment, encourage sustainable management of forests, improve the landscape, improve woodland biodiversity, provide opportunities for recreation and sport, and an alternative land use to agriculture (European Commission 2000; Northern Ireland Forest Service 2002).

Felling is not controlled by a system of felling licences in Northern Ireland, but the EU Directive 97/11 concerning deforestation for purposes of conversion to other land uses covers the province (Richardson 2000).

Protected forests

Northern Ireland has 2 000 ha of woodland areas under statutory protection. The Northern Ireland Forest Service administers protective regulations for forests such as approval of Felling Licences and promotes compliance with the UK Forestry Standard and the protection advice provided in related documents (Sustainable Forestry...2002).

Northern Ireland is currently in the process of designating Areas of Special Scientific Interest (ASSI). It is envisaged that the initial period of designation will be complete within a few years (2005), with a total of 7% of semi-natural woodlands designated (Richardson 2000).

Discussion

6.1 Summary of national policies

There has been an evident change both in the physical qualities of European forests and in their functions during recent decades. The functions of the forests have become more diverse and the provision of different kinds of services has grown in importance at the expense of wood production. Nevertheless, wood production still has a key role, and for some European countries, such as Austria, Finland and Sweden, it will remain as one of the most, if not the most, important forest function. Recreation, landscape, biodiversity and other forest services are becoming significant in all European countries and in some countries they are already the primary functions of forests. The trend toward multi-purpose forestry and forests has been clear in all the European countries during the last decade.

The forest policies of many of the European countries have been revised or completely changed during the last part of the 1990s. These policy changes reflect a shift in the forest paradigm change and more general, underlying cultural changes. There has been a shift toward the post-industrial forest paradigm, which includes changes in management objectives, species composition, location, management style and approach, and values of forests. The changed forest policies in Europe have several characteristics in common: the objectives of the new forest laws include a balance between economic, cultural, and environmental functions of forests, new laws are in conformity with the UNCED principles and other international agreements on forests, national forest programmes are prepared with a participatory, open and holistic approach, policy planning is cross-sectoral, the protection of forests has increased and environmental or ecosystem management approaches to forest management have been adopted. Changes in forest policy have also included restructuring of the forest administration in some countries, usually toward decentralisation.

The new forest policies of the European countries follow a common trend, but differences in national policies and in their emphases remain. These differences can partly be explained by the varying forest situations and roles of the forest sector in the individual countries. In accordance with these differences the countries can be divided into five groups, which were also used in an exercise to construct forest land use scenarios (Kankaanpää and Carter 2004). These groups and their characteristics are briefly described below:

- Group I (Austria, Finland, Norway, Sweden):
 - wood production is a key forest function
 - forestry is an important sector in the national economy
 - forest areas of the countries are large, both relatively and absolutely
- Group II (Belgium, the Netherlands)
 - agricultural sector is strong/agricultural land use dominates
 - high population pressure
 - forestry is a marginal sector in the national economy
 - forest areas small, properties fragmented
 - other land uses dominate forest land use

- Group III (Denmark, Ireland, Switzerland, United Kingdom)
 - other forest functions than wood production also important (such as protection function in Switzerland)
 - other forest products than timber important (Christmas trees, foliage, etc.)
 - forestry of little importance in national economy
 - forest areas are small, relatively and in absolute terms
 - afforestation/forest area increase emphasised
- Group IV (Greece, Italy, Portugal, Spain)
 - Mediterranean countries
 - forestry sector weak
 - parcelled forests
 - other forest functions than wood production important
 - non-wood forest products important
 - forest fires and drought are major problems
- Group V (France, Germany)
 - wood production is an important forest function
 - high population pressure
 - other land uses dominate forest land use
 - large forest areas in absolute terms, forests parcelled
 - per capita forest area less than in the northern countries

In the countries of the first group, the forest sector is a central sector in the national economy and forest policies are key instruments both in determining the development of forests and also in influencing other sectors of society. The wood production function of forests is important and policies are biased towards economic interests (in Sweden, though, the policies have an equal stress on production and protection functions). In the countries of the second group, forestry is a marginal sector in the economy and issues such as agricultural production, urbanisation and population pressure have a great impact on forest areas. In the countries of the third group, forest policies emphasise the multiple functions of forests and the goal of afforestation and increasing forest areas is clearly expressed. Switzerland is an exception as maintaining the existing forest area is the goal there. In the Mediterranean countries (Group IV) deforestation is forbidden by law, but forests are threatened by natural and human induced damages such as forest fires, lack of management and over-exploitation. Wood is for a large part produced in plantations and the forest sector is not very strong. In the fifth group the agricultural sector is strong and population pressure high. The forest sector is not as important as in the Nordic countries, but the countries are still large producers of wood and the wood production function of the forests is emphasised in forest policy.

6.2 Policies and the future development of European forests

Policies are considered to be among the major factors influencing the forest sector in general and forest land use change in particular. It was beyond the scope of this study to assess to what extent the policies will be implemented and will influence and affect forestry and forests in Europe. This would be an important subject for further research. The policies, if implemented, will have an impact on the area, location and purpose of the forests, as well as their management and species composition. Forests can change the physical environment and landscape of large numbers of people in Europe, and have impacts on the national economies and society at large. From this review, it appears likely that the forest area of Europe will increase or at least remain stable. Biodiversity of forests will increase, at least in the

part of the forests which are either protected or where new close-to-nature management styles will be adopted. Multi-purpose use of the forests will increase and replace the use of forests exclusively for wood production. In some countries recreation and amenity will become the principal forest functions. The location of the forests will be different as well: there will be more forests on former agricultural lands, lowlands and on better soils than previously, and there will be more recreational and buffer zone forests around urban centres. Ecological zones and protection areas will be extended in many countries. Citizen participation in forest planning will increase and the policy formulation process will be decentralized to regional levels of administration.

The present policies set trends for the future development and are an indication of the direction of change of the forest sector in Europe. It is unrealistic to assume that all the targets of the policies will be implemented, but the direction of change can be detected from them. The change on the ground will take a long time to materialize, partly because of the natural characteristics of forests, such as long rotation periods, and partly because it can take a long time before new management regimes are adopted. It is uncertain how long the present trends will endure and whether there will be another paradigm change in forest management in the future. However, rapid changes in policies or values concerning forests will not have an immediate effect on the forests. Policies can therefore be seen also as an indication of what the future forests of Europe would be like. The information presented in this report can be useful to decision makers and planners as summarising the current policies and plans, and as indicative material for the future development of European forests.

7

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Appendix I

Regional forest policies in Italy

Valle d'Aosta

Valle d'Aosta is the smallest region of Italy and is entirely mountainous. The total agricultural area is 138 000 ha and utilised agricultural area, almost entirely pasture, is 92 500 ha. The forest area is 89 500 ha or almost 27% of the total area. 55% of forests are privately owned and 45% are public.

Forestry is the responsibility of the Regional authorities in Valle d'Aosta (Valle d'Aosta 2002). There is a regional development programme for 2000-2006. The forestry related measures of the programme include (European Commission 2000; Piano di Sviluppato...2000):

- improving competitiveness of the forestry system
- afforestation as a measure for safeguarding the environment and landscape. Afforestation should take place on degraded and abandoned land areas.
- silvicultural measures in forests damaged by natural disasters
- protection of forests against forest fires

Bolzano

Forests cover about 42% of the total area of Bolzano, or 311 000 ha, of which 52% are in private ownership. 72% of the forests are situated at altitudes 1200 m or higher. Timber production is the most important forest function in 67.5% of forests. 7.7% of the forests are protected and outside production and 24.4% are protected, but are also in production. Non-wood products are important as well as the forests' role in protection of the soils and water, recreation and tourism and as a natural environment (Provincia Autonoma...2001; Il sistema forestale 2001).

About 5% of the forests in Bolzano are in a natural condition and 30% close to the natural state. 41% are moderately modified and 22% strongly modified. 2% of the forests are artificial (Provincia Autonoma...2001). Forest area per capita is 0.70 ha.

There is a regional forest law in Bolzano (1996), which aims at preserving the forest area and guaranteeing its territorial distribution and favouring the protective, productive, aesthetic and recreational functions of forests. Close-to-nature silviculture is emphasized. All forest properties over 100 ha should have a management plan (Provincia Autonoma...2001).

The rural development programme for Bolzano 2000-2006 (European Commission 2000) aims to strengthen the competitiveness of the agriculture and forestry sectors while protecting the environment and encouraging sustainable development of rural areas. The programme has forestry measures, including aid for conservation and durable management of forests and an aim to protect the environment and landscape.

Trento

Forests cover 55.4% (344 000 ha) of the regional territory of Trento. In Trento the forest area per capita is 0.75 ha, compared to the national average of 0.12 ha.

Forests have many functions in Trento: productive, landscape, recreation, protection of soils and water, tourism, biodiversity, cultural and symbolic values. At higher altitudes the forest area has increased on marginal agricultural lands. At lower elevations there has been deforestation because of urban expansion and

pressure from other land uses. Excessive infrastructure building in the mountains and pressure from tourism has caused destruction of forests. The causes of deforestation in the Province of Trento in 1995-1999 were:

- construction of infrastructure, 39%
- agriculture, 49%
- building construction, 4%
- construction of tourism services such as skiing centres, 8%

The areas deforested in 1980-97 as a consequence of different factors have been:

- agricultural expansion, 330 ha
- urbanization and infrastructure building, 530 ha. The forest area affected by the building of roads and tourism facilities is much larger
- mining, 930 ha
- building of winter tourism facilities, 550 ha

Tourism affects 24 000 ha of forest land, on which activities such as outdoor recreation and sports are carried out (Piano di Sviluppo...2000). The rural development programme 2000-2006 for Trento aims to develop agriculture in a durable context and to safeguard the rural environment and landscape. The forestry measures include modernisation of the forestry system and arable land afforestation. The afforestation of abandoned agricultural land aims at (Piano di Sviluppo...2000; European Commission 2000):

- increasing the forest cover for the protection of watersheds and environment
- timber production
- enhancing the biodiversity
- enhancing recreational and landscape values
- recovering and conserving traditional vegetation

Other forestry measures include:

- promotion of investment to the forestry sector (infrastructure, marketing, rationalization of timber production)
- introduction of forest certification systems
- afforestation of non-agricultural lands. These areas include watershed protection areas, areas important for biodiversity and of value for recreation, landscape and environment
- reconstruction of damaged forests and measures for prevention of natural disasters
- maintenance of the ecological stability of forests

Friuli-Venezia Giulia

Forests cover 35% of the area of the region of Friuli-Venezia Giulia and they are situated in the mountain areas. The forest area is 275 500 ha, of which 190 000 ha is planted forests and 85 000 ha are created by natural regeneration. 58% of the planted forests are public (115 000 ha) and 42% private (85 000 ha). The private forests are very fragmented (Regione autonoma...2002; Piano di Sviluppo...2000; Imboschimento...2000).

Timber production takes place in the public forests, but forests are also important for the protection of biodiversity, for sequestration of carbon, for the local climate and for environmental reasons. Close-to-nature silviculture is promoted in Friuli-Venezia Giulia and most forests are managed according to its principles. The multi functionality of forests is emphasized.

In the rural development programme 2000-2006 in the forestry sector the region aims at (European Commission 2000, Imboschimento...2000):

- developing and improving the socio-economic potential of the forests
- multifunctional and integrated planning of forests
- sustainable forest management
- conserving and enhancing the existing forests

- increasing the forest area in the plains region
- preserving the ecological and protective value of forests
- rationalization of the forest sector

The forestry measures include:

- afforestation of agricultural and non-agricultural lands
- improvement of the economic, ecological and social aspects of the forests
- reconstruction of damaged forests

Lombardia

Forests cover about 20% of the territory of Lombardia. Almost three-quarters of the forests are in the mountain region. Two-thirds of the forests are privately owned and 33% public. Up to 1950 Lombardia experienced continuous deforestation as forests were transformed into agricultural use and fuel wood was collected. For the last 50 years the forest area has increased, mainly because of natural causes. Many of the existing forest areas are abandoned due to the decline of agriculture in mountain regions and a lower level of management by land owners, increased management costs, difficult access to many areas including a lack of roads and other infrastructure, and excessive fragmentation of forest properties.

The abandonment of forest properties has negative effects on the management and use of the forests. The forests age and the quality of the timber decreases, there is increased danger of occurrence of parasites and diseases and the hydro-geological function of forests deteriorates.

The regional development programme of Lombardia for 2001-2003 has the following objectives for regional forestry (La politica forestale...2002):

- safeguarding, managing and improving the area and productivity of forests
- protection of forests against biotic and abiotic threats and fires

The rural development programme 2000-2006 has the following forest measures:

- arable land afforestation
- durable management of forestry resources

Afforestation on arable land should serve an environmental and protective function and take into consideration protection of soils and amelioration of environmental conditions and landscape. Part of the afforestation should be done by planting appropriate species for timber production, biomass production and of species with rapid growth. The species that are planted in the protective and timber production forests should be chosen to increase the ecological stability of forests (Imboschimento delle supeficie ...2000; European Commission 2000).

Piemonte

The forest area of Piemonte is 665 000 ha (ISTAT 1994), which is the second largest for a region in Italy, just after Toscana. Most of the forests (67.8%) are private and mostly located on better soils. 28.5% of forests are communal and are situated in the mountains, 1.1% belong to the state and the region and 2.5% to other organizations.

The increment of the forest area in Piemonte has been the consequence of natural afforestation on abandoned agricultural and mountain areas and only for a minor part a result of planning and afforestation policies. The characteristics and composition of forests have changed during the last decades. The chestnut forests have changed into mixed broadleaved forests and the orchards have decreased from 68 000 ha to 38 300 ha in 45 years. Of the 38 300 ha about 16 000 ha are under cultivation. The conifer forests have increased as a result of plantations (from 96 000 ha in 1948 to 112 000 ha in 1994). The major cause of damage to the forests is fire. The average annual area of forests damaged by fire was 4 600 ha in 1988-96 (Il settore forestale 2000).

The rural development programme for Piemonte 2000-2006 aims to sustainably develop economic, social and environmental aspects of rural areas. The forestry measures include arable land afforestation and other measures (European Commission 2000).

Veneto

The forest area of Veneto is about 272 000 ha (ISTAT) or 19% of the territory of the region. Forests cover 45% of the mountain areas. The forests are mostly resin (122 000 ha), and then cedar forests (98 000 ha) and less important in terms of area are broadleaved forests (15 000 ha). 50% of the forests are privately owned and 30% are communal forests. The forest area is growing, the increment is constant but small: about 50 ha/year (Regione del Veneto 2002).

The rural development programme for Veneto region aims to consolidate and sustainably develop rural activities in an economic, social and territorial context, based on a strategy, which recognizes the key role and multiple functions of agriculture. Forestry measures include protection and development of forests (extension of wooded areas, development of the wood trade and ecological management of forestry resources, diversification), protection of the natural environment, biodiversity and landscape (European Commission 2000: Piano di Sviluppo...2000).

Liguria

During the past years the forest area of Liguria has increased continuously as a result of migration from the rural areas and abandonment of cultivated and pasture areas. There have also been negative effects for forests in the lower altitude hills because of population pressure. Fire and diseases also damage the forests. The total forest area of Liguria is 370 000 ha (Regione Liguria 2002).

The forest policy of Liguria has the following objectives (Regione Liguria 2002):

- to restore the forests
- to safeguard the landscape values of forests
- to increase the productive capacity of forests
- to prevent forest fires
- to modernize forestry

The rural development programme for Liguria aims to strengthen the competitiveness of regional agriculture, ensure environmental protection and adapt rural services and infrastructure to changes brought about by European integration. The measures of the programme related to forestry include: landscape preservation and neglected land maintenance (particularly for fire prevention), afforestation of agricultural and other land, management of forestry resources and investments in environmental protection (cleaning of soils for example), improvement of the social, economic and ecological quality of forests, restoring the damaged forests, and maintenance and improvement of the ecological stability of forests. The afforestation of agricultural lands is focused on the most marginal land. Afforestation should improve the quality of timber produced, maintain the natural environment taking into consideration landscape values, reduce risks of hydrogeological damage in the most critical areas, combat desertification and consider carbon sequestration (Regione Liguria 2002; European Commission 2000).

Emilia-Romagna

Forest inventories are carried out in the region of Emilia-Romagna (Inventario forestale 1998) and a land use map of the region (1:25 000) has been prepared (1994). The total forest area of the region is 551 400 ha, of which 425 600 ha are forests and

125 800 other woodlands. Most of the forests are in the mountain region (494 000 ha) (Il piano territoriale...2001; Superfici forestali...2001).

The rural development programme for Emilia-Romagna sets goals for improvement of forest environment. The aims include:

- increase the level of biodiversity in forest areas
- improve the ecological quality of forests
- protect the areas that face the greatest risks of erosion and hydrogeological damages
- improve the structure of productive forests
- promote sustainable management of forests

The programme also includes afforestation of agricultural and non-agricultural lands (Regione Emilia-Romagna 2002; European Commission 2000).

Toscana

Forests cover 47% of the territory of Toscana. According to the ISTAT inventory, there are 888 600 ha of forests; in the regional forest inventory the area of forests is given as 1.86 mill ha. Most of the forests are in the hills (60% of the forest area); 30% are in the mountain region. Cedar forests represent 75% of all the forests. The private forests are highly fragmented, a high percentage of the cedar forests are old and degraded. The forests serve several functions in Toscana: wood production, production of other forest products, erosion prevention, watershed protection, and landscape value as an area for tourism and recreation (Regione Toscana, Giunta Regionale 1998).

A Regional Forestry Programme of Toscana for 2001-2005 has been published by the Region of Toscana (March 2001). The objectives and measures of the programme include:

- improvement and restructuring of existing forests is given priority over afforestation
- afforestation with specific aims: watershed management, reconstruction of areas damaged by natural disasters
- naturalisation of conifer forests, especially pine forests
- preventing and fighting forest fires

The rural development programme for Toscana includes the following forestry measures: improvement of the rural environment through forestry measures, afforestation of agricultural and other lands, and ecological stability of the forests. The objectives of the programme concerning the forestry sector are:

- conservation of the forest resources, in particular biodiversity
- improvement of the environmental and landscape functions of forests
- improvement of the carbon sequestration properties of forests
- rationalization and modernization of the forestry sector
- extension of the forest area especially to the areas where there is now proportionally less forest and the share of forests is small compared to other land uses

Afforestation should take place in all areas of the region, close-to-nature silvicultural measures should be used and the species planted should be applicable to the site and the natural environment (Piano di Sviluppo...2000; European Commission 2000).

Umbria

The forest area of Umbria is 301 400 ha, representing 35.6% of the territory. 72% of the forests are privately owned. 85% of the forests are cedar forests. The forest area has been gradually increasing during the last 80 years. Almost 98% of the wood production of the region is for fuel wood. Non-wood products are important, especially truffles, mushrooms and chestnuts (Regione Umbria 2002).

The rural development programme for Umbria has protection and development of the environment and landscape as one of its priorities. The forestry measures of the programme include (Regione Umbria 2002; European Commission 2000):

- afforestation of agricultural and other lands
- improvement of the economic, ecological and social characteristics of forests
- restoration of forests damaged by natural disasters
- prevention of natural disasters
- maintenance and improvement of the ecological stability of forests

Marche

The forest area of Marche is 160 000 ha, which is 16.5% of the total land area. 67% of the forests are in the mountain region and 33% in the plains. 74% of the forests are cedar forests. 63% of the forests are in private ownership, 16% are owned by the state, region and communes and 2% by other organisations (Regione Marche 2000).

The rural development programme for Marche includes forestry and other related measures: safeguarding the landscape and natural heritage by arable land afforestation, forestry investments and water resources management (European Commission 2000).

Lazio

Forests cover 22% of the territory of Lazio, totalling 382 000 ha. During the 1990s about 4000 ha have been afforested (Assessorato per le Politiche...1998).

The rural development programme for Lazio aims at consolidating the production system of rural areas, in particular in the disadvantaged internal areas, to ensure harmonious growth in terms of economic and social development and protecting and developing natural resources. Forestry measures of the programme include afforestation of agricultural land and other forestry measures (European Commission 2000; Assessorato per le Politiche...1998).

Abruzzo

The total agricultural area of the region is 804 000 ha of which 50% are meadows, pastures and forest (Agricoltura 2002).

The rural development programme 2000-2006 for Abruzzo aims at protecting and developing environmental resources. In the less exploited territories that are richer in environmental resources, these resources should be preserved. 5000 ha of new afforestation should be completed during the period of the programme. The programme also aims at improving forestry by returning the forests closer to their natural state (Regione Abruzzo 2002; European Commission 2000; Direzione agricoltura ...2002).

Molise

The regional operational programme for Molise for 2000-2006 aims at the preservation and development of the multifunctionality of forests in rural areas, taking into account the economic, ecological and social functions of forests. The regional rural development plan has afforestation of agricultural land as its forestry measure. The aim is to increase woodland areas by 3% in 2000-2006 (Assessorato Agricoltura... 2002; European Commission 2000).

Campania

The rural development programme for the region of Campania has afforestation of agricultural land as a forestry measure. The programme will enable afforestation of 2000 ha and agri-environment and afforestation measures should cover 0.5-1.5% of the region. There are some maps of the region available in the internet (Regione

Campania 2002; European Commission 2000; Area generale...2002; Settore politica...2002).

Puglia

The agricultural area of Puglia is 1.74 million ha. of which 1.43 million ha is utilised. Less favoured and mountain areas make up around 40% of territory and forest cover is very limited.

The rural development programme for Puglia has afforestation of agricultural land as its forestry measure. The programme aims at 4000 ha of afforestation and the maintenance of 3500 ha of existing woodlands (Regione Puglia 2002; European Commission 2000; Servizi di Sviluppo...; Piano di Sviluppo...2001).

Basilicata

The region has 760 000 ha of agricultural land, of which 610 000 ha are utilised. Of the utilised agricultural land, 20% is covered with forests. Three-quarters of the forests are located in the mountains. There has been deforestation in Basilicata as a result of forest fires and pressure from agricultural land use.

Basilicata has a regional forest law and afforestation programme (2001). The rural development programme for Basilicata has afforestation of agricultural areas as a forestry measure. The type of afforestation selected should be according to the geological and climate conditions of the area, using indigenous or naturalised species (Regione Basilicata 2002; European Commission 2000; Agricoltura e Sviluppo Rurale).

Sardegna

The forest area in Sardegna is 900 000 ha, of which 224 000 ha are cedar forests. The per capita forest area in Sardegna is 0.34 ha, which is above the national average. Forest fires are a major cause of deforestation; in 1999 23 000 ha in total were affected by fires, 27.7% of this area was forest (Piano di Sviluppo...2000).

The rural development programme for Sardegna has afforestation of agricultural lands as its forestry measure. The objectives of the measure include (Piano di Sviluppo... 2000; Regione Autonoma...; Assessorato dell'Agricoltura; Corpo Forestale...):

- increase in forest area of the island
- increase in biomass production
- decrease in agricultural area

Calabria

75% of the land area of Calabria is devoted to agriculture. 58% of the region is upland (hill or mountain). Protected areas cover 13.8% of the territory.

Calabria has a law for afforestation and soil protection (1992). The law aims at afforestation, improving the existing forests and reconstruction of degraded forests (ARSSA-Calabria 2001; Dipartimento 14...; European Commission 2000).

Sicilia

The rural development programme for Sicilia has arable land afforestation as a forestry measure. The measure aims to diversify the economic activities of farms while combating soil erosion and damage (Regione Sicilia 2002; European Commission 2000; Assessorato Agricoltura...2002).

Documentation page

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Author(s)	Susanna Kankaanpää and Timothy R. Carter		
Title of publication	An overview of forest policies affecting land use in Europe		
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Abstract	<p>This report was prepared within the European Commission funded ATEAM (Advanced Terrestrial Ecosystem Analysis and Modelling) project and is a part of a study, in which forest land use scenarios for Europe for the 21st century were constructed.</p> <p>Policies are recognized as one of the main driving forces of land use change in Europe. This study presents an overview of forest policies and trends as they affect land use both EU-wide and at national level in Europe. The study served as background material for the construction of forest land use change scenarios that are presented in a separate report.</p> <p>There has been an evident change in both the physical qualities of European forests and in their functions during recent decades. The trend towards multi-purpose forestry and forests is clear in Europe and the trend can be assumed to continue for decades to come.</p> <p>The forest policies of most European countries presented in this report have been revised or completely changed during the 1990s. There has been a shift towards the post-industrial forest paradigm, which includes changes in management objectives, species composition, location, management styles and approaches, and values of forests. Changes in forest policy have also included restructuring of the forest administration in some countries, usually toward decentralization. Current forest policies in Europe, if implemented, will have an impact on the area, location and purpose of forests, their management and species composition. They are likely to change the physical environment and landscape adjacent to large numbers of people, and have impacts on national economies and society at large. On the ground the changes will take a long time to materialize, partly due to the natural characteristics of forests and partly because it can take time before new management regimes are adopted. The present policies set trends for future development, providing an indication of the likely directions of change in European forests. Such background information could be of value to decision makers and planners concerned about the long-term future of European forests.</p>		
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Julkaisun osat/ muut saman projektin tuottamat julkaisut	Kankaanpää, S. ja Carter, T.R. 2004. Construction of European forest land use scenarios for the 21st century. Suomen ympäristö 707, Suomen ympäristökeskus, Helsinki. Julkaisu on saatavana myös internetistä: www.environment.fi/publications											
Tiivistelmä	<p>Tämä selvitys tehtiin Euroopan komission rahoittamassa ATEAM-hankkeessa (Advanced Terrestrial Ecosystem Analysis and Modelling) ja on osa metsämaankäytön skenaarioiden kehittämistä.</p> <p>Politiikat ovat yksi tärkeimmistä maankäytön muutokseen vaikuttavista tekijöistä Euroopassa. Selvitys on yleiskatsaus etenkin sellaisista Euroopan metsäpolitiikoista ja kehityskuluista, joiden katsottiin vaikuttavan maankäyttöön suorasti tai epäsuorasti sekä EU:n että kansallisilla tasoilla. Selvitys oli taustamateriaalina Euroopan metsämaankäytön skenaarioiden kehittämistyössä. Skenaariot on julkaistu erillisenä raporttina Suomen ympäristö-sarjassa.</p> <p>Euroopan metsien ominaisuuksissa ja käyttötavoissa on tapahtunut selviä muutoksia viime vuosikymmenien aikana. Metsien käyttömuodot ovat moninaistuneet ja erilaisten myös aineettomien palvelusten tuottaminen on tullut tärkeämmäksi. Suunatus monikäyttömetsiin on selkeä Euroopassa.</p> <p>Suuri osa tässä raportissa esitetyistä metsäpolitiikoista on muunnettu tai kokonaan muutettu 1990-luvulla. Uusilla metsäpolitiikoilla on monia yhteisiä piirteitä: uusien metsälakien tavoitteisiin kuuluu pyrkimys metsien taloudellisten, sosiaalisten ja ympäristötehtävien tasapainoon, lait toteuttavat UNCED:in ja muiden kansainvälisten metsäsopimusten periaatteita, kansallisia metsäohjelmia valmistellaan ja toteutetaan, strateginen suunnittelu on sektorirajat ylittävää ja kestävä metsätalouden periaatteet on omaksuttu. Joissain maissa myös metsähallinto on uudistettu, usein kohti hajautettua tai alueellista hallintoa.</p> <p>Nykyiset metsäpolitiikat toteutuessaan vaikuttavat metsäalaa, metsien sijaintiin ja käyttöön, metsänhoitoon ja puulajiekoostumukseen. Ne todennäköisesti muuttavat hyvien monien ihmisten ympäristöä ja maisemaa, ja vaikuttavat kansantalouksiin sekä yhteiskuntiin laajemmin. Maanpinnan tasolla muutokset kestävät kauan, osittain johtuen metsein luontaisista ominaisuuksista, osittain siitä hitaudesta, millä uudet metsänhoitotavat omaksutaan. Nykyiset politiikat suuntaavat tulevaisuuden kehitystä ja antavat viitteitä tulevaisuuden muutoksen suunnasta Euroopan metsissä. Tällainen taustatieto saattaa olla tarpeen päättäjille ja suunnittelijoille.</p>											
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Sammandrag	<p>Rapporten skrevs inom ATEAM-projektet (Advanced Terrestrial Ecosystem Analysis and Modeling), som finansierades av Europeiska kommissionen. Den är en del av ett arbete för att utveckla scenarier för skogsmarkens användning i Europa i det 21 århundradet.</p> <p>Policy erkänns vara en av de viktigaste drivande faktorerna bakom förändringar i markanvändning i Europa. Dethär arbetet presenterar en översikt över skogspolicy och trender som påverkar markanvändningen både inom EU och på nationell nivå i Europa. Arbetet gav bakgrundsmaterial för att utveckla scenarier för användningen av skogsmark. Scenarierna presenteras i en skild rapport.</p> <p>Under de senaste årtiondena har skogarna i Europa tydligt förändrats både vad gäller de fysiska egenskaperna och funktionen. Det finns en klar trend för mångbruksinriktat skogsbruk i Europa och trenden kan antas fortsätta under de kommande årtiondena.</p> <p>De flesta europeiska länder som presenteras i den här rapporten har reviderat eller helt förändrat sin skogspolicy under 1990-talet. Det har skett en övergång mot det post-industriella tankesystemet i skogsbruket, som innefattar förändringar i skogsbrukets målsättning, artsammansättningen, läget, skogsbruksattityder, och skogens värde. Policyförändringarna har även innefattat omstruktureringar i skogsadministrationen i endel länder, oftast i riktning mot decentralisering. Nuvarande skogspolicybeslut i Europa, om de implementeras, kommer att ha en inverkan på arealen, läget, och syftet med skogen, skogsbruket och artsammansättningen. Policybesluten kommer troligen att påverka den fysiska omgivningen och landskapet i närheten av stora mängder människor, och inverka på nationella ekonomier och samhället i stort. Förändringarna kommer i praktiken att ta lång tid att förverkliga, delvis pga skogens naturliga egenskaper och delvis för att det kan ta tid innan nya skogsbruksregimer tas i bruk. Nuvarande policylinjer sätter trender för den framtida utvecklingen och ger en indikation om den sannolika riktningen för hur Europas skogar kommer att förändras. Den här bakgrundsinformationen kan vara värdefull för beslutsfattare och planerare med intresse för europeiska skogars framtid på långsikt.</p>											
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ENVIRONMENTAL POLICY

An overview of forest policies affecting land use in Europe

This report was prepared within the European Commission funded ATEAM (Advanced Terrestrial Ecosystem Analysis and Modelling) project and is a part of a study, in which forest land use scenarios for Europe for the 21st century were constructed. Policies are recognized as one of the main driving forces of land use change in Europe. This study presents an overview of forest policies and trends as they affect land use both EU-wide and at national level in Europe. Current forest policies in Europe, if implemented, will have an impact on the area, location and purpose of forests, their management and species composition. They are likely to change the physical environment and landscape adjacent to large numbers of people, and have impacts on national economies and society at large. The present policies set trends for future development, providing an indication of the likely directions of change in European forests.

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