



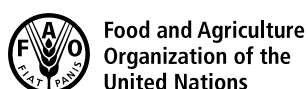
# ***Summary for Policy Makers***

State of Europe's Forests 2020

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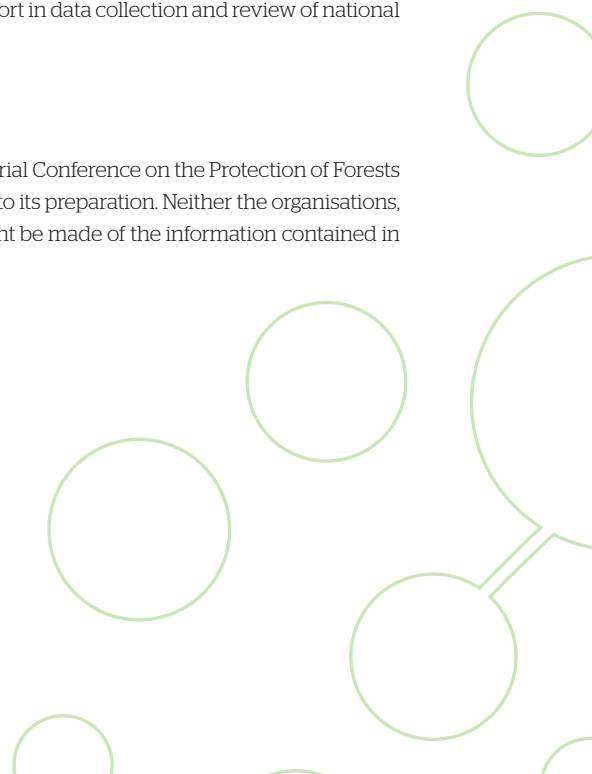
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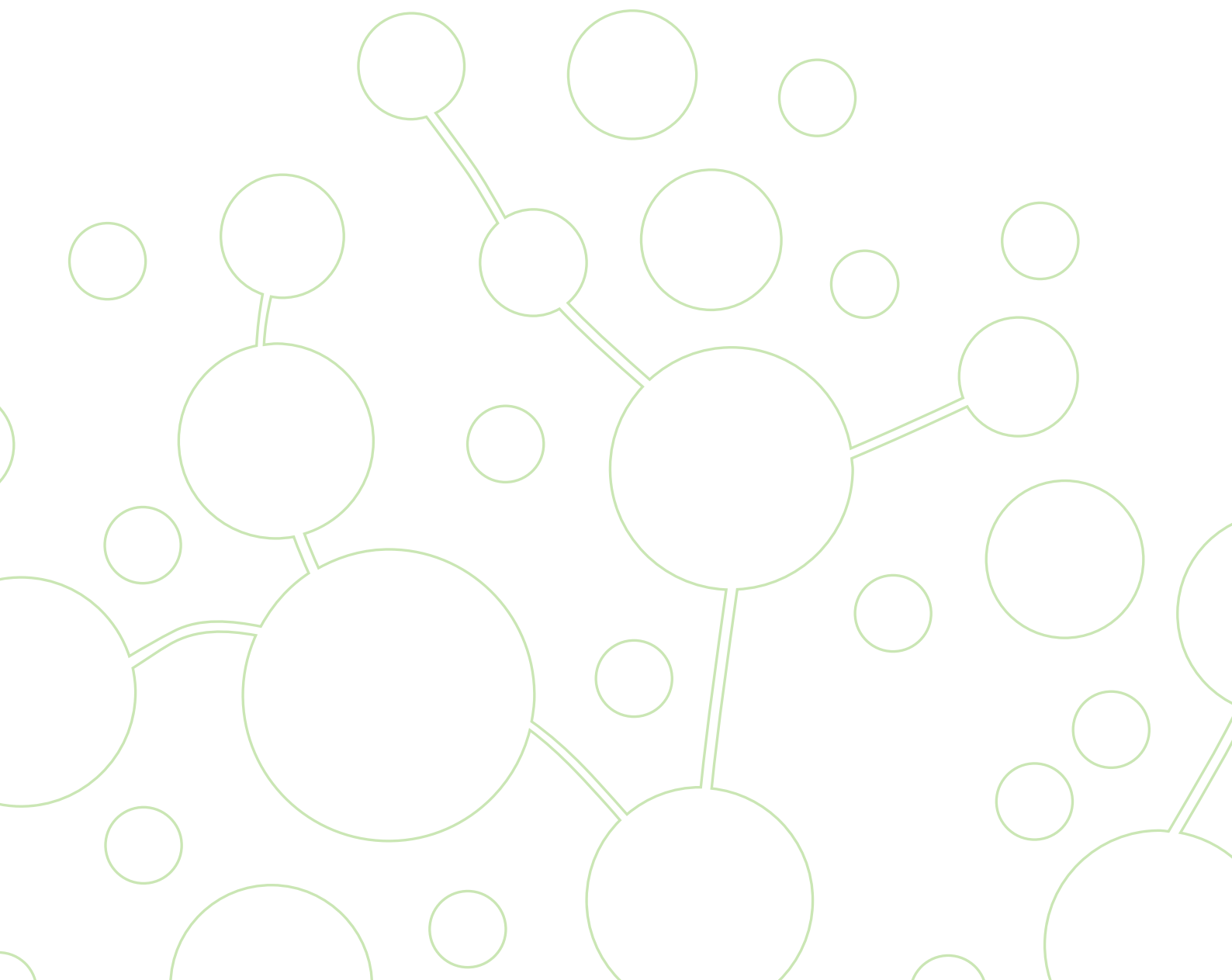
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# ***Summary for Policy Makers***

State of Europe's Forests 2020





Sustainable forest management means 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.

*Resolution H1 of the Helsinki Ministerial Conference on the Protection of Forests in Europe, 1992*



# Summary for Policy Makers

If managed sustainably, forests play an indispensable role in climate and biodiversity protection. They protect soils and water resources, provide livelihoods, and contribute to the wellbeing of rural and urban communities.

European forests are multifunctional, providing a range of ecosystem services, including the production of renewable materials that are able to substitute for alternatives with a higher

environmental footprint, thus also contributing to climate neutrality and overall sustainability.

Since the 1990s, FOREST EUROPE has been providing an intergovernmental platform for promoting sustainable management of forests in the pan-European region, and, in cooperation with numerous partners, has been monitoring its implementation using an internationally agreed upon set of criteria and indicators.

***The State of Europe's Forests 2020 (SoEF 2020) is based on the best available information and the work of over one hundred national correspondents, scientists, and experts; it shows that:***

## ***European forests are expanding, storing carbon, and supplying wood on a sustainable basis***

The area of forests in Europe<sup>1</sup> has increased by 9% over the last 30 years. At 227 million ha of forests, more than one-third of Europe's land surface is forested.

The volume of wood and the weight of carbon stored in the biomass of European forests have grown by 50% over the last 30 years as forest area expanded and only a part of the increment has been harvested. About three-quarters of the net annual wood increment is felled.

Every year in Europe, forests sequester in their biomass about a tenth of the carbon dioxide emissions produced in other sectors. Carbon stored in harvested wood products also contributes to the reduction of CO<sub>2</sub> emissions.

The volume of wood supply has grown, reaching 550 million m<sup>3</sup>, which is 40% more than in 1990.

## ***European forests contribute to biodiversity conservation, employment, and income of rural communities***

European forests are predominantly semi-natural and the tree species diversity of forest stands has been increasing since 2005. The amount of deadwood in European forests is also growing.

About 2% of the forests are considered undisturbed by man.

Nearly 24% (almost 50 million ha) of forests are in areas protected for the conservation of biodiversity and

landscape, considerably more than several decades ago. The area of forests designated for biodiversity conservation has increased by 65% in 20 years, and the area designated for landscape conservation by 8%.

Forests designated for the protection of soil, water, and other ecosystem services represent about 32% of the forest area.

Populations of common forest bird species have been stable for almost 40 years.

The vast majority of European forests are open to the public, while 6% are primarily designated or managed for public recreation.

Forestry and the wood processing industries provide employment for more than 2.6 million people in Europe. However, employment in the forest sector is steadily declining - by about 33% from 2000 to 2015.

Forestry is still an occupation with a high number of accidents: 24 out of every 1 000 workers suffer an accident at work every year.

## ***A framework for forest policy and governance guarantees implementation of sustainable forest management***

European countries confirm having an institutional framework for forestry in place, although its organisational and administrative set-up differs between countries. National forest laws guarantee legal certainty at national levels. Recent challenges include reorganisations and budget restrictions.

<sup>1</sup> "Europe" in this publication includes Asian parts of Georgia and Turkey, and Cyprus. Information is derived from data as reported by countries. The publication does not contain data for the Russian Federation.



National Forest Programmes or equivalents are now a well-established policy instrument across the region, with the aim of facilitating cross-sectoral dialogue on forest related policies. Forest inventories have a central role in forest monitoring.

Governments devote public resources to support sustainable forest management, including through publicly owned forest services and companies, central budget allocations, and systems of grants, subsidies and fiscal measures. Systems of payments for ecosystem services have also been introduced in several countries.

***Still, there are significant threats and challenges, mainly to forest health and economic sustainability***

Biotic and abiotic forest damage can have a devastating effect on forest ecosystems locally. At the European level, 3% of the forest area was affected

by damage in 2015. However, a growing frequency of large-scale forest disturbances has been observed recently, including extreme droughts, heat waves, extensive bark beetle outbreaks, and more extensive forest fires.

Deposition of air pollution has continuously decreased over the last 25 years; however, some pollutants still locally exceed critical loads.

On average, the condition of European forests is deteriorating. Mean foliage loss of trees increased at 19% of monitoring plots, more than double the number of plots where foliage improved in the period 2010-2018.

The relatively low net revenue of forest enterprises poses a risk for forest management, especially in the environment of volatile markets, adverse effects of changing climate, and requirements for more demanding silvicultural systems.

***SoEF 2020 demonstrates that many, even most, aspects of European forests have been managed sustainably for many years. Nevertheless, ...***

There are significant threats and challenges, notably from forest disturbances and from economic factors. Furthermore, there are increasing demands on forests, for carbon sequestration, for renewable bio-based materials and products which can substitute non-renewable ones, for rural livelihoods, and for recreation, all in the context of a rapidly changing climate. There are calls for modified silviculture to meet the new demands and to adapt to changing climate conditions. There are, undoubtedly, limits to the forests' capacity to respond to these demands, which necessitate trade-offs between them.

The concept of sustainable forest management is based on the idea of fulfilling the ecological, economic, and social functions of forests on a basis which will provide benefits for present generations while not sacrificing the needs of future ones, as defined at the Helsinki Ministerial Conference in 1992.

As shown above, and in the detail below, Europe has been in a state of balance between the components of sustainable forest management for many decades. The new pressures and challenges may, however, lead to changes in this equilibrium. Transition from one state of balance to another would necessitate holistic and evidence-based decisions, to ensure that all aspects of sustainability are fully considered.

SoEF 2020 has presented the status and trends of all aspects of sustainable forest management, using the best available data and building on the support of all governments in the region as well as the scientific community. This report has no mandate to make policy recommendations; however, it provides a sound, objective, and comprehensive basis for the ongoing debate and decisions on the future direction of forest management in Europe.



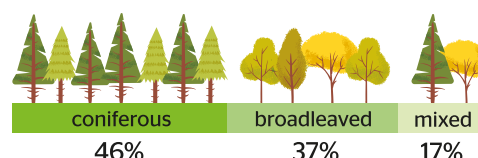
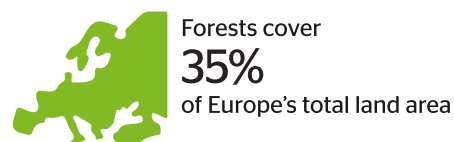
# Forest Resources and their Contribution to Global Carbon Cycles

## Forest area has increased by 9% since 1990, although the rate of expansion is slowing down

The 227 million ha of forests in Europe cover 35% of total land area. Other wooded land accounts for an additional 27 million ha.

Around 75% of the forest area is available for wood supply.

46% of European forests are predominantly coniferous, 37% are predominantly broadleaved, and the rest are mixed.



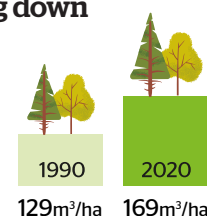
## A quarter of European forests are uneven-aged



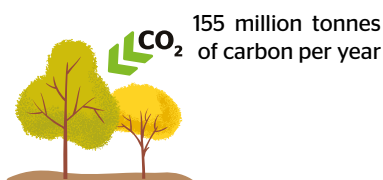
About three-quarters of forests in Europe are even-aged, of which about 64% are beyond the regeneration phase and have not yet reached the mature phase. Nearly a quarter of European forests are uneven-aged.

## Growing stock has increased by 50% since 1990, although this trend is slowing down

The total growing stock of European forests adds up to 34 900 million m<sup>3</sup>, of which about 84% is located in forests available for wood supply. On average, there are 169 m<sup>3</sup> of growing stock per ha, which is 40 m<sup>3</sup> per ha more than thirty years ago.



## European forests are a major carbon sink; carbon stock increases in forests and in wood products



Between 2010 and 2020, the average annual sequestration of carbon in forest biomass reached 155 million tonnes in the European region. In the EU-28, sequestration corresponds to around 10% of gross greenhouse gas emissions. In the period 1990-2015, the carbon stock in harvested wood products increased from 2.5 to 2.8 tonnes of carbon per capita, thus contributing to CO<sub>2</sub> emission reductions.

## Related policy responses focus on increasing forest area, but its funding and competing land uses remain a challenge

The major challenges and obstacles to achieving policy objectives include the funding of afforestation, reforestation and climate change adaptation activities, competing land uses interests, and effective operation and coordination of all key sectors and key stakeholders, as well as more frequent and more severe weather events resulting from climate change.



# Forest Ecosystem Health and Vitality

## Deposition of air pollution has been continuously decreasing since 1997

Despite an overall decrease in deposition of air pollution, forests in Europe are still exposed to excessive levels of nitrogen deposition and tropospheric ozone.



## Soil properties show limited changes



A comparison of 2015 data with those from a survey performed in 2009-2012 revealed limited changes in soil properties, with only total nitrogen showing a generalized increase across Europe. Distinct North-South gradients were observed, the most pronounced being for the content of soil organic carbon, C:N ratio, and pH.

## Defoliation is increasing

Although defoliation of trees at 72% of monitoring plots remained stable, foliage loss increased at 19% of plots in the period 2010-2018. Overall, the condition of European forests is apparently deteriorating, with increasing mean defoliation of the main tree species.



## About 3% of European forests are damaged, mainly by wind, insects, ungulate browsing, and forest fires



There is a clear regional pattern in specific disturbances: fires occur mostly in the Mediterranean region, and windstorms and heavy snowfalls in central and north-western regions. Ungulate browsing is a European-wide disturbance. Damage by insects fluctuates, while damage by wind and snow has increased. However, an apparent shift in disturbances has been observed recently, suggesting extreme droughts and heat waves, more extensive bark beetle outbreaks, and a wider occurrence of forest fires.

## Related policy responses focus mainly on prevention of forest fires, ungulate browsing, and insect outbreaks

Reported measures address the prevention and control of hazards, crisis management, as well as a reduction of soil degradation. The major challenges and obstacles are the increasing threat of damage caused to forests by harmful organisms and extreme weather events, mass dying of forest tree species, and the unclear adaptive potential of tree species.

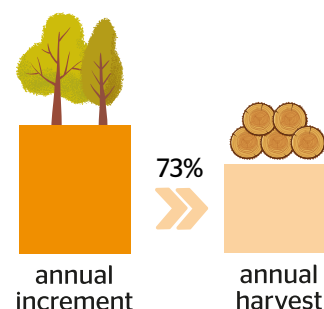




# Productive Functions of Forests

## Increment in European forests substantially exceeds felling

Every year, more wood grows than is harvested in European forests, leading to the accumulation of growing stock in forests. Net annual wood increment is higher than in earlier periods. Since 1990, it has increased by approximately 25%. The volume of timber harvested has been increasing steadily since 1990. On average, 73% of the net annual increment is felled, thus indicating the sustainability of wood supply from European forests.



## Europe is an important roundwood-production region

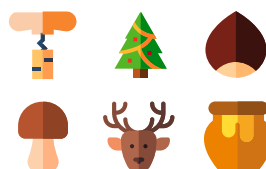
550 million m<sup>3</sup> / year



Roundwood production in Europe has been growing, reaching a maximum of almost 550 million m<sup>3</sup> annually. The reported total value of marketed roundwood is also continuously increasing and reached about EUR 21 000 million annually around 2015. The reported roundwood volumes and values per unit are highly variable across the reporting countries.

## Forests and other wooded land are an important source of non-wood goods, such as food and materials

Cork, Christmas trees, chestnuts, fruits, mushrooms, wild meat, and honey represent traditional non-wood goods. These goods are a source of additional income from forests. The reported value of marketed non-wood goods in Europe was about EUR 4 000 million in 2015.



4 000 million €  
non-wood goods

## Market realisation of forest services remains underdeveloped

500 million €  
marketed services



Social services, including hunting and fishing licenses, predominate among marketed services of forest ecosystems, followed by biosphere services. The total reported value of marketed services was around EUR 500 million, although data availability is limited.

## Related policy responses aim to improve timber supply by a higher use of increment and of accumulated growing stock

The major challenges and obstacles include low economic efficiency and performance of the forestry sector, a lack of enabling entrepreneurship environment, support for innovations, increasing competition for forest resources and their services, and underdeveloped markets for ecosystem services. Reported measures focus on marketing and promotion of forest products and services.



# Biological Diversity in Forest Ecosystems

## Stands composed of two or more tree species predominate in European forests

European forests are steadily becoming more diverse in tree species composition. Stands composed of two or more tree species occupy 67% of the forest area. 33% of the forests are composed of stands dominated by single tree species – either monocultures or naturally homogenous forests.



## The majority of European forests are naturally regenerated

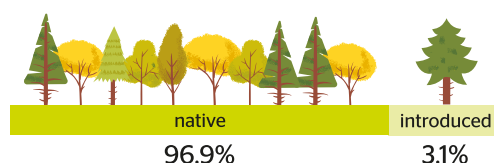


66% of the total forest area in Europe was regenerated naturally or result from natural expansion, and the share of these forms of establishment is slightly increasing.

In 2020, plantations covered only 3.8%; Forests undisturbed by man cover 2.2% of European forest area.

## Introduced tree species cover 3% of total forest area

Introduced tree species are used quite marginally in European forestry, covering 3.1% of the total forest area. The forest area dominated by invasive alien tree species is about 0.5% of Europe's forests and slightly increasing.



## Volume of deadwood corresponds to about 7% of growing stock



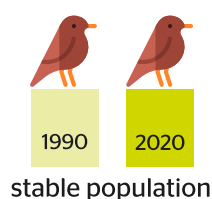
Deadwood provides microhabitats for many animal, fungi, and plant species; it is also an important part of the forest carbon pool and of nutrient cycles. The average volume of deadwood was 11.5 m³ per ha in 2015.

## The number of genetic conservation units has increased about 10 times since 1990

Further effort is needed to fill the gaps in geographical representativeness of conserved populations of tree species.



## Populations of common forest bird species are generally stable



There were only minor fluctuations in the common forest bird index over the last 37 years. The fact that populations of common forest bird species are stable indicates the overall stability of the forest environment and biodiversity.

**Over the past 20 years, the area of forests designated for biodiversity conservation increased by about 65%**

**Protected forests account for almost a quarter of the total forest area**



**23.6%**  
of Europe's forests  
are in protected areas

*In 2015, the reported protected forest area was 49.3 million ha (23.6% of total forest area in reporting countries) and 4.1 million ha of other wooded land was also protected (20.5% of total other wooded land) in 2015. About 15% (or 31 million ha) of European forests are protected, with the main objective of conserving biodiversity, while about 9% (18 million ha) aim at protection of landscapes and specific natural elements.*

**Related policy responses focus on integrated forest management, conservation of high conservation value forests, and enhanced cross-sectoral cooperation**

*Targets include increasing protected forest areas and deadwood volumes, as well as halting the loss of species diversity. Reported measures focus on the integration of biodiversity protection into forest management planning, conservation of forests of high conservation value, and enhanced coordination of and collaboration between respective offices on biodiversity issues, as well as on the conservation of forest genetic resources. Major challenges and obstacles include limited effectiveness of biodiversity conservation and protection, more demanding management systems, and a lack of convergence of nature conservation and forest policy objectives.*



## **Protective Functions in Forest Management (notably soil and water)**

**Protective forests prevent soil erosion, preserve water resources, and maintain other ecosystem services**



Protective forests form  
**32%**  
of Europe's forests

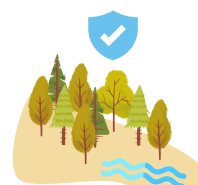
*Protective forests designated for prevention of soil erosion, preservation of water resources, and maintenance of other ecosystem services represent about 32% of forest area in countries reporting on this indicator.*

*Protective forests designated to protect infrastructure and managed natural resources are reported on about 2% of forest area, while on forest and other wooded land it amounts to 2.6%.*

*The area of protective forest is increasing in Europe. In addition, the protective functions are often also integrated into multifunctional forestry outside of areas specifically designated for this purpose.*

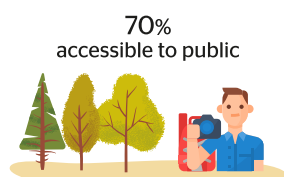
**Related policy responses focus mainly on better provisions of the protective functions of forests**

*Measures mainly include implementation of legal and financial policy tools. The major challenges and obstacles to achieving the policy objectives are seen in reduced funding and staff, pollutants originating from other sectors, and ageing protective forests which can no longer sufficiently fulfil protective functions.*



## Socioeconomic Functions and Conditions

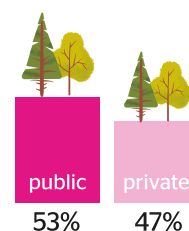
### 70% of forests and other wooded land are available for public recreation



In the majority of countries, more than 90% of forests are accessible to the public, with the average around 70%. About 6% of forests are primarily designated or managed for public recreation. The average intensity of recreation is estimated at 16 visits per inhabitant per year.

### Forest area in public and private ownership is roughly balanced in Europe

About 53% of forests in Europe are in public ownership and 47% in private ownership. Private holdings are, in general, much smaller than public ones.



### The forest sector contributed about 0.7% to GDP in Europe

The forest sector consists of forestry, the wood industry, and the pulp and paper industry. The forest sector contributed 2% to gross domestic product in North Europe, reflecting regional differences.

### Net revenue in forestry is volatile

Net revenue represents a source of income for forest owners. In an environment of volatile markets and adverse effects of changing climate, low net revenue poses a risk to forest management.

### Investments in forestry show a slightly positive trend

The capacity of forests to produce goods and services is influenced by investments in forests and forestry. Gross fixed capital investments decreased, in nominal terms, in the period 2000-2010 and showed an increase in 2015 reaching about EUR 22 per ha.



### About 1.1 m<sup>3</sup> of wood is consumed annually per capita in Europe

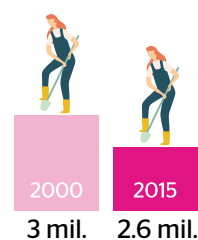


Wood consumption comprises sawn wood, wood-based panels, paper, paperboard, and energy wood. Per-capita annual wood consumption varies between European regions, ranging from 0.7 m<sup>3</sup> in South-East Europe to 2.6 m<sup>3</sup> in North Europe in 2015, with an average of 1.1 m<sup>3</sup>.

Wood consumption increased in all regions between 1990 and 2015, except Central-West Europe where, however, it is still the second highest after North Europe.

## There are more than 2.6 million employees in the forest sector

In 2015, about 4 employees worked per 1 000 ha of forest. In the forest sector (including forestry, wood manufacturing, and the paper industry), there were more than 2.6 million employees. Employment in the forest sector decreased by about 33% from 2000 to 2015.



## The reported number of fatal accidents in forestry decreased markedly



Working in forestry is still dangerous. In 2015, 149 fatal and almost 21 000 non-fatal accidents were reported in Europe, corresponding to about 24 accidents per 1 000 forest workers.

## Europe is a net exporter of primary wood and paper products

The trade of forest products comprises exports and imports of roundwood, energy wood, sawn wood, wood-based panels, and pulp, as well as paper and paperboard. Europe is a net exporter of these wood and paper products, with an European trade surplus of about 30 million m<sup>3</sup> roundwood equivalents or EUR 5 500 million in 2015. Having doubled from 1990 to 2005, export volume stagnated in the period 2005-2015.



## Renewable energy from wood covers about 6.4% of total energy consumption



Wood is one of the renewable sources of energy, covering 6.4% of total primary energy supply in Europe in 2015. Reflecting the state of development in the wood processing sector, about half of the energy from wood is supplied directly from the forest, significantly complemented by co-products and residues of wood processing industries and by post-consumer recovered wood.

## Related policy responses focus on education and training, improved access to forests and recreation opportunities, as well as financial support and communication to stakeholders

Most countries have policy objectives focussing on ecosystem services, free access to forests, forest related value chain contribution to GDP, favourable employment opportunities, forest biomass for energy generation, investments for innovation, and sustainable consumption. Reported measures include support of research, education and training, improved access to forests and increased recreation areas, safety and health protection campaigns and training. The major challenges and obstacles relate to continuing depopulation of rural areas, difficulties in ensuring occupational safety and health, pressures from increasing recreation use, but also to limited access infrastructure, volatile wood markets, and inefficient use of woody biomass.





