



Federal Ministry
of Food
and Agriculture

German Forests

Forests for Nature and People

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“Our forests are true all-round talents. But how can we combine all these requirements, requests and interests on the very same land?”

Dear Readers,

Germany is a land of forests. Around a third of our total area is covered in forests. Forests are our green lungs. In addition to that, they offer a place for leisure activities: Over 90 percent of Germans spend time in forests on a regular basis. Forests are our number one climate change mitigators: German forests annually sequester about 62 million tonnes of atmospheric carbon dioxide. They provide shelter to and a habitat for animals and plants: Almost 3,000 plant species grow in German forests. And every year, our forests provide us with around 76 million cubic metres of the precious resource of timber. Forests therefore form a significant sector and provide jobs, especially in rural areas: 750,000 people work in the forestry and timber sectors.

Our forests are true all-round talents. But how can we combine all these requirements, requests and interests on the very same land? How can we make our forests resilient to the devastating consequences of climate change? How can we preserve our forests' biodiversity? And how can we secure the renewable resource of timber for the future? Finding answers to these questions is one of the long-term responsibilities of forestry policy. Sustainable and multifunctional forest management is a key factor.

All nation-wide forest policy measures are pooled under the coordination of the Federal Ministry of Food and Agriculture. My Ministry – together with the federal states – supports the implementation of sustainable forest management through a number of programmes at federal level such as the new “Forest Investment Programme”.

In this brochure, you will find a comprehensive overview of the current state of forests and Germany's forest policy approaches.

I hope you enjoy your read.

Yours sincerely,

Julia Klöckner

*Federal Minister of Food
and Agriculture*



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Introduction

Today, forests cover a third of Germany's territory. Human needs have been shaping this ecosystem and its appearance for centuries. The impact of climate change on the ability of forests to provide resources for humans and nature is already noticeable. Only through responsible and sustainable forest management will we be able to strengthen forests and ensure that they can continue to provide their many benefits for nature and people.

The principle of sustainability originated in the field of forestry. Originally, the term only related to wood utilisation and the aim was to not harvest more trees than the forest could regrow.

However, over time people realised that a forest is not only a source of timber. A forest also protects soil, stores water, offers employment opportunities and serves as an economic driver. A forest provides a habitat for plants and animals, a place for recreation, an air filter, as well as a source of oxygen. As a carbon sink and reservoir, it contributes significantly to climate change mitigation.

In other words, forests provide a multitude of goods and services which humankind takes advantage of. To recognise this, the principle of sustainable wood harvesting was expanded and redefined as **sustainable forest management**.



Sustainable Forest Management (SFM)

Sustainable forest management is a management concept which is conscious of the need of future generations to also enjoy the same benefits from forests as people do today. With this in mind, the Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE) met in 1993 and formulated six overarching criteria for the following subject areas:

-  Forest Resources
-  Forest Ecosystem Health and Vitality
-  Productive Functions of Forests
-  Biological Diversity in Forest Ecosystems
-  Ecosystem Services
-  Socio-Economic Relevance of Forests

Forestry in Germany is oriented towards these sustainability criteria with the basic aim of fulfilling all services across the entire area of forested land. Instead of a recreational forest in one area and a timber plantation in another, the aim is to manage all forests as near to nature as possible. To ensure this, it is a constant mission for forest policy to balance the different demands society imposes on forests. The Federal Ministry of Food and Agriculture (BMEL) facilitates and guides the relevant political processes at national level.

“The cultivation of timber and the preservation of forests requires skill, knowledge and commitment so that they can be used permanently, stably and sustainably, as wood is essential, and the well-being of the country depends on it.”

A translation of a passage from the book *Sylvicultura oeconomica* from 1713, in which **Hans Carl von Carlowitz**, the chief mining official in Saxony, coined the German term for sustainability: ‘*Nachhaltigkeit*’.

One characteristic of forestry in Germany is selection cutting as a timber harvesting method. Clear-cutting is avoided through frequent forest thinning and use of natural regeneration where possible.

The concept of sustainability has shaped the practice of forestry in Germany for 300 years.



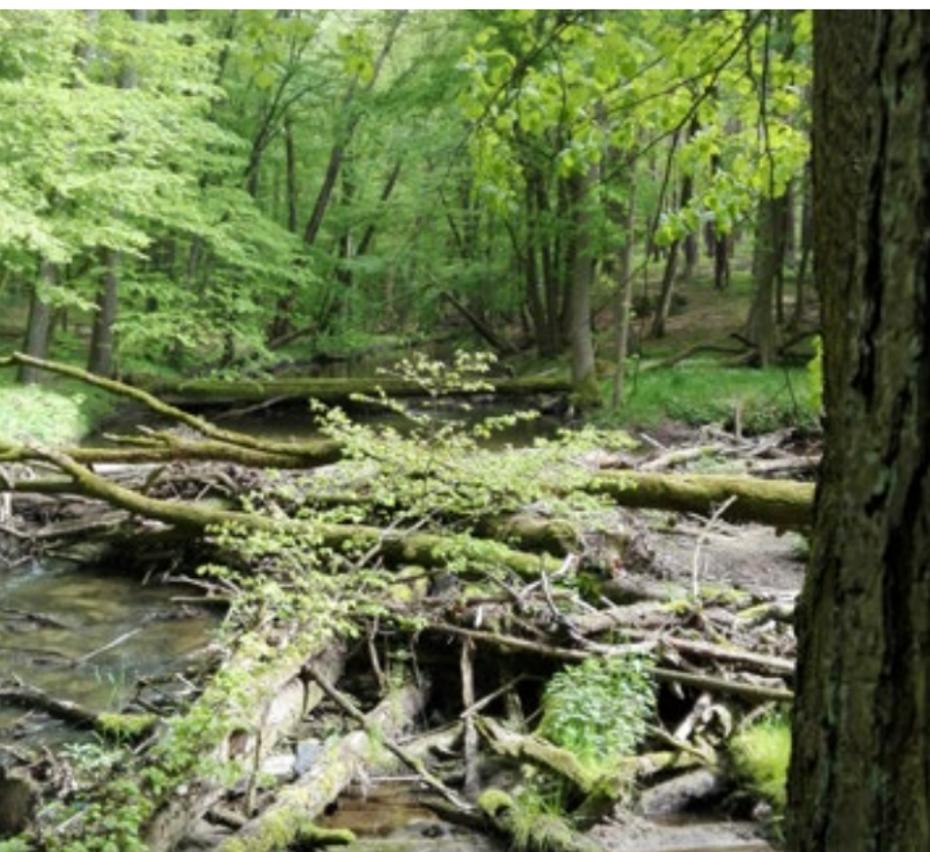
Source: FNR/idea: caepsele.de
 commissioned by: anzingrundrasp for BaySF

Fig. 1: The forests in Germany fulfil many ecosystem services within the same area.

The Social Significance of Forests

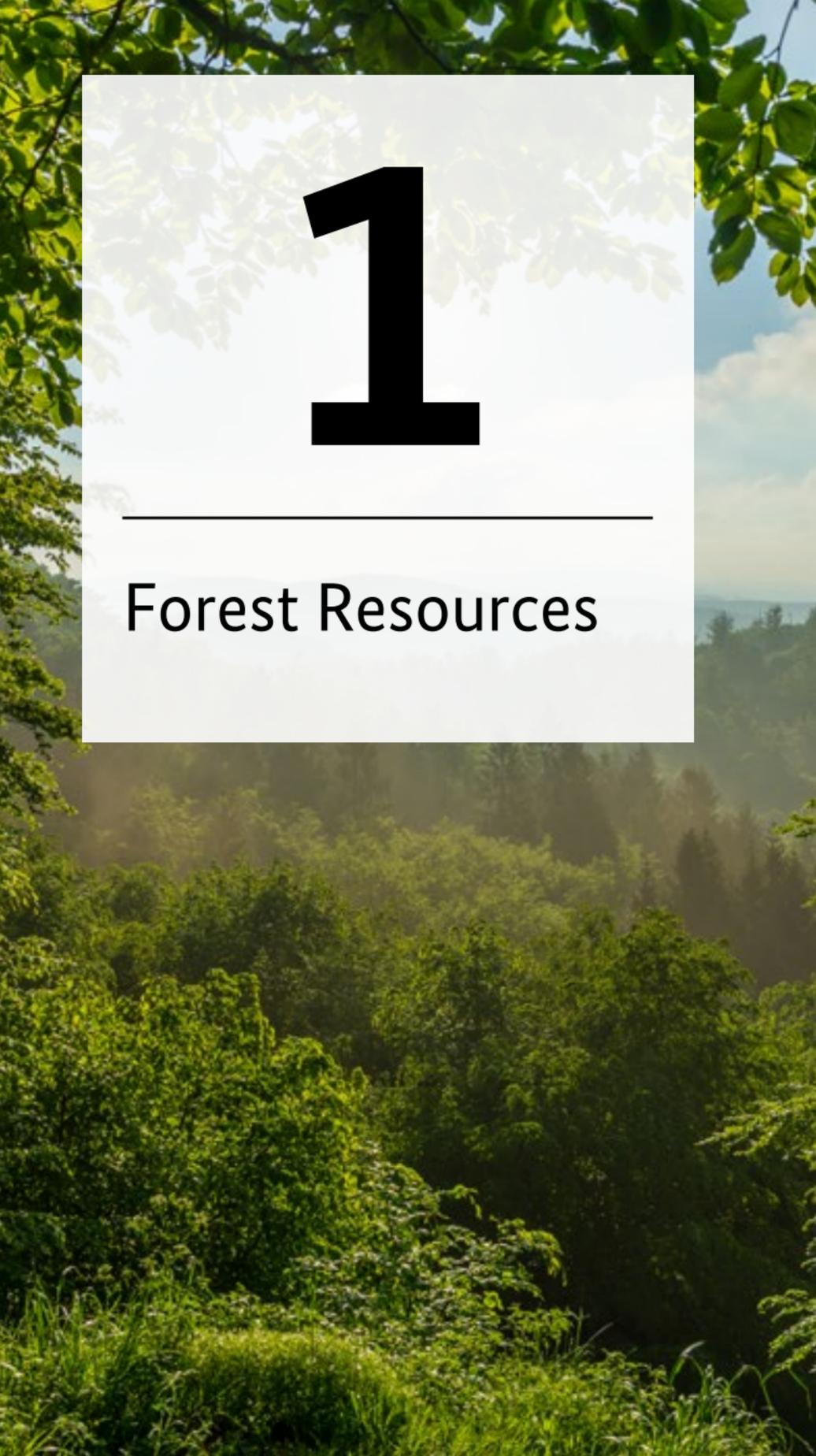
Germans are said to have a special relationship with their forests. Forests already play a significant role in the numerous fairytales and legends that are a part of the country's cultural heritage.

Surveys in Germany have provided an insight into the public's view of forests and their functions. According to the results of these surveys, German forests are highly valued by the population.



SURVEYS IN GERMANY SHOW THAT FORESTS AND FORESTRY ARE HIGHLY VALUED BY THE POPULATION.

- 🍃 98 percent of Germans consider the provision of natural **habitats** for animals and plants to be important.
- 🍃 95 percent of Germans consider the forests' contribution to **climate change** mitigation to be important.
- 🍃 For Germans, opportunities to **experience nature** (90 percent) and enjoy **outdoor recreation** (77 percent) in the forests is considered to be important.
- 🍃 For 88 percent of Germans, the sustainable supply of **wood** is an important function of forests.
- 🍃 85 percent of Germans feel that forests play an important role in **protecting** people from natural hazards, such as avalanches and floods.
- 🍃 78 percent of Germans see forests serve as an important **economic driver** in rural areas.



1

Forest Resources

In its 1993 Helsinki Declaration, the Ministerial Conference on the Protection of Forests in Europe (FOREST EUROPE, MCPFE) formulated the criteria for sustainable forest management. The first criterion is the **maintenance and appropriate enhancement of forest resources and their contribution to global carbon cycles**. Indicators describing this in greater detail relate to:

-  the forest area,
-  the growing stock,
-  the variety of tree species,
-  the forest as a carbon sink and
-  the timber harvest volume

1.1 Forest Area

Forests cover 32 percent (11.4 million hectares) of Germany's territory, making it one of Europe's most forested countries. Since World War II, the forest area has been

-  expanded by more than 1.5 million hectares, and
-  home to some 90 billion trees,
-  which translates to 1,000 trees per capita.

In the wake of the climate crisis, the transformation from purely coniferous forests to stable deciduous and mixed forests has become a core element of German forestry. The discussion on forest transformation was first triggered by

- 🍃 the forest dieback (Waldsterben) observed in the mid-1980s,
- 🍃 major windstorm disasters of the 1990s

Forest area in Germany I

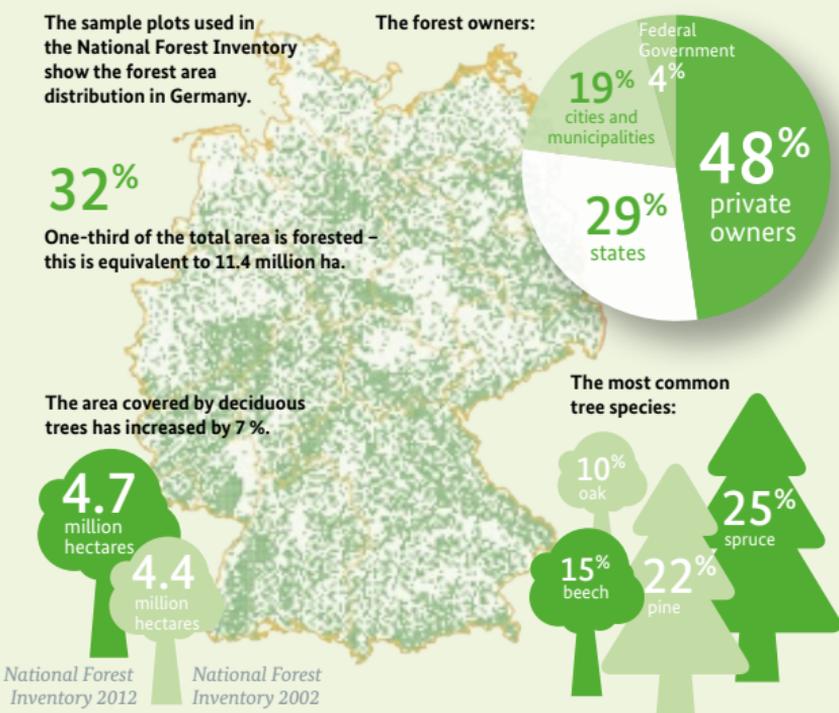
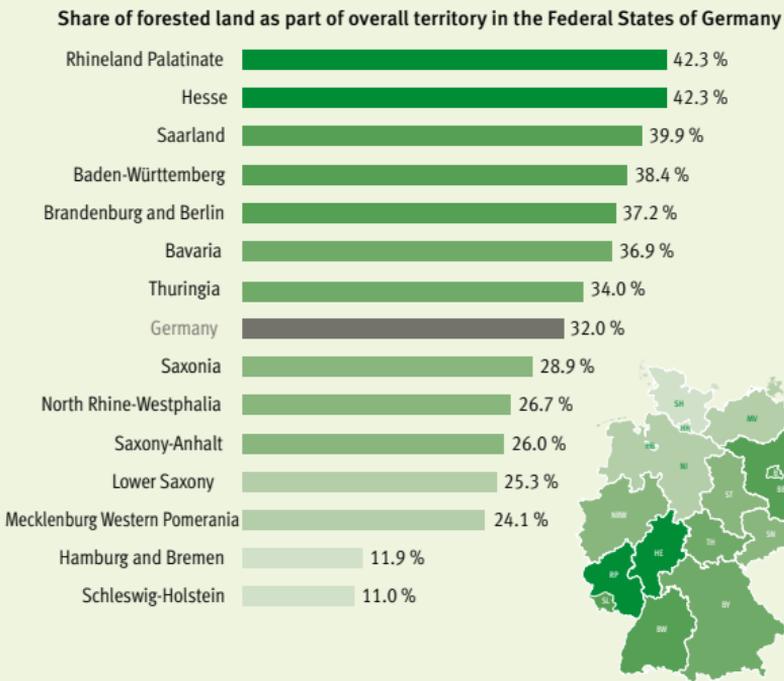


Fig. 2: Forested area in Germany by area, ownership structure and tree species composition.

Large areas of pure spruce forests, which resulted primarily from the reforestation of wastelands after World War II, fell victim to environmental damage and weather extremes. Owing to forest-transformation efforts, deciduous and mixed forests now account for a significant portion (72 percent) of forested land. There is natural regeneration in 85 percent of the forest area, making it the dominant form of forest regeneration.

Forest area in Germany II



Source: Thünen-Institute, 3rd National Forest Inventory (2014)

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Fig. 3: Forest area in Germany by share of total area in each federal state of Germany.

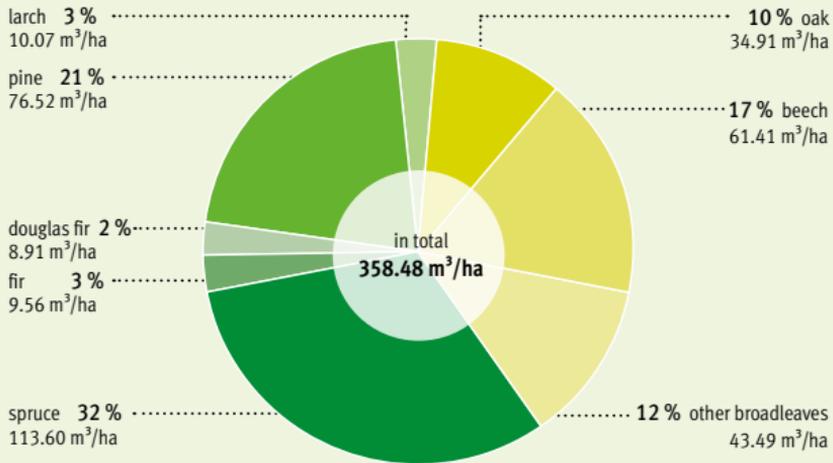
1.2 Growing Stock and Annual Increment

With a growing stock of 3.9 billion cubic metres, Germany's forests have the highest growing stock in Europe after Russia. This figure amounts to an average of 358 cubic metres per hectare. This high growing stock has been achieved through



-  clearly regulated reforestation and the promotion of natural regeneration,
-  continuous forest tending over decades with regular thinnings,
-  promotion of the most valuable trees,
-  selection cutting,
-  promotion of important forest structures and extraction of competing trees,
-  longer production periods.

Growing stock



Source: Thünen Institute, Carbon Inventory (2019)

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Fig. 4: Growing stock by tree species per hectare in Germany's forests.

On average, the annual increment in Germany's forests is 10.9 cubic metres per hectare (period 2012–2017). Overall, 117 million cubic metres of wood grow in Germany every year.

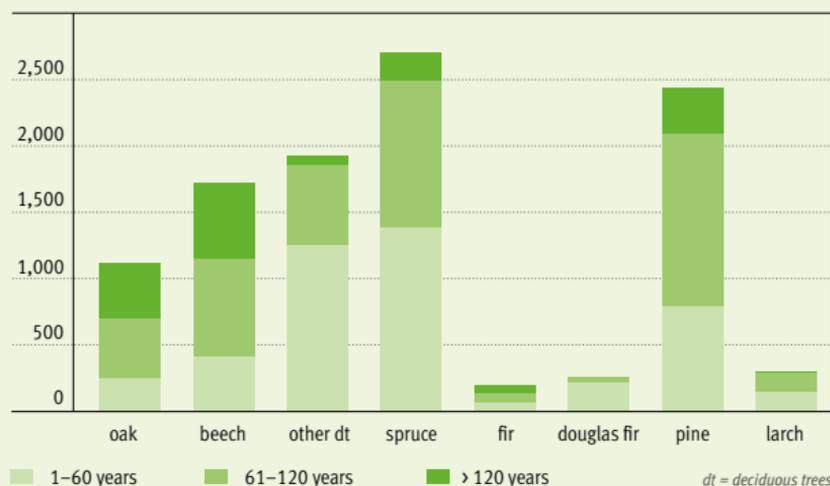
1.3 Age Structure

Today, trees in German forests have a statistical average age of 77 years. On more than a quarter of the area, the trees are over 100 years old. A high average age has a positive effect on

- 🌿 the average diameter of tree trunks, which has consistently been increasing over the past decades,
- 🌿 the structure of the forest and, thereby, on habitat and overall biodiversity.

Age class structure by tree species 2017

in 1,000 ha



Source: Thünen Institute, Carbon Inventory (2019)

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Fig. 5: Older trees with larger trunks are the result of nation-wide forest-transformation programmes that have been running for three decades with the aim of enhancing the structural and species diversity of forests.

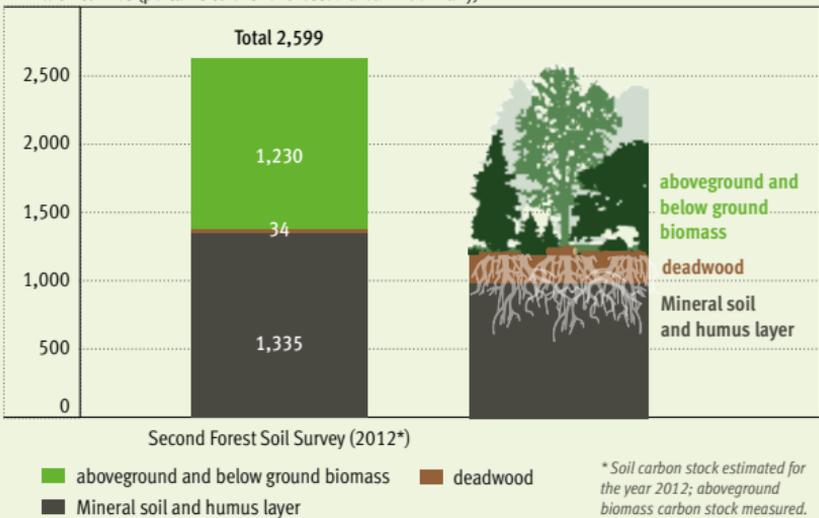
1.4 Forest Carbon

The forest ecosystem is an important carbon sink. Germany's forests sequester roughly 62 million tonnes of carbon dioxide from the atmosphere each year. This is about half of the total climate effect of forest and timber, see chapter 5.4. The forest carbon stock in German forests aggregates to

- 🌿 2.6 billion tonnes of carbon in total,
- 🌿 this amounts to more than 228 tonnes of carbon per hectare.

Total carbon stock in forests and forest soils in Germany

in million tonnes (pertains to entire forested area in Germany)



Source: Thünen Institute, Carbon Inventory (2019); Grüneberg et al., Carbon Stocks and Carbon Stock Changes in German Forest Soils (2019)

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Fig. 6: Total carbon stock stored above and below ground in German forests.



2

Forest Ecosystem
Health and Vitality

Germany is part of the “International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests network”, providing it with information through its forest-related environmental monitoring. Thirty years of efforts in the scientific monitoring of forests in Europe – strengthened significantly by decisions of the Ministerial Conference on the Protection of Forests in Europe (MCPFE) in Strasbourg in 1990 – led to the current comprehensive monitoring programme for forests. Its results provide information on forest condition, air pollution, climate change, and biodiversity. The overview of forest degradation gained through this programme serves as the basis for the second criterion of sustainable forest management, the **“maintenance of forest ecosystems’ health and vitality”**. Be it biotic or abiotic factors, like insect calamities or windstorm events – the challenges associated with the maintenance of forest ecosystems are immense. This is why German forest experts, like in other parts of Europe, are paying special attention to:

-  the development of forest soils,
-  the tree-crown condition as an indicator of forest health,
-  biotic and abiotic influences and
-  the impacts of climate change.

2.1 Soil Condition

The results of the second Forest Soil Survey of 2012 show that, thanks to improved air-pollution control, forest transformation efforts and soil liming, forest soils have begun to recover from the effects of air pollution in past decades (“acid rain”):

-  The soils contain less acid, and the condition of humus and base saturation of the soils has improved.
-  The heavy-metal content of the humus layer has decreased.
-  The share of areas with critical loads of eutrophying nitrogen has declined, but the current figure of over 50 percent is still high.

2.2 Forest Health

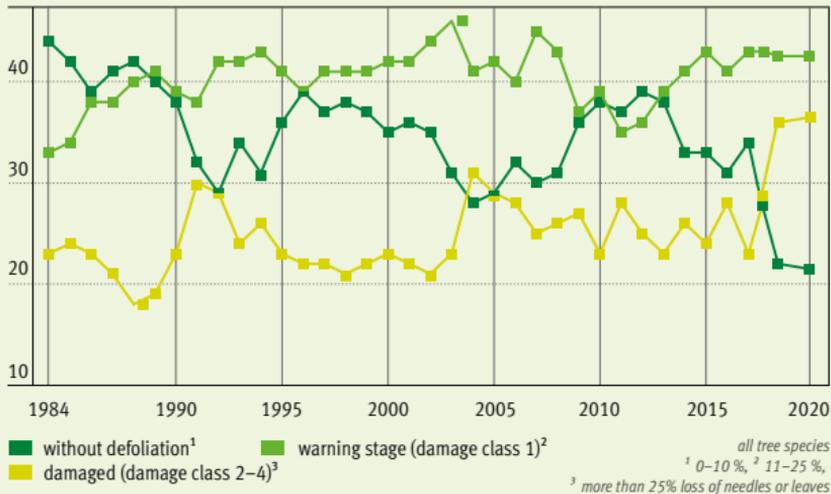
An important indicator for the health condition of trees is the density of crown foliage. In general, the more sparsely foliated the crown, the poorer the health condition of the tree. According to the 2020 Forest Condition Survey:

-  21 percent of the trees show no crown defoliation,
-  42 percent are currently at the warning level and
-  37 percent show significant crown defoliation (all figures represent long-term averages).

Crown defoliation among deciduous trees has increased sharply since the start of the survey, while no trend has been observed in the crown condition of coniferous trees.

Development of crown condition in Germany

in % of forest area, all tree species



Source: Federal Ministry of Food and Agriculture, The Forest Condition Survey (2021)

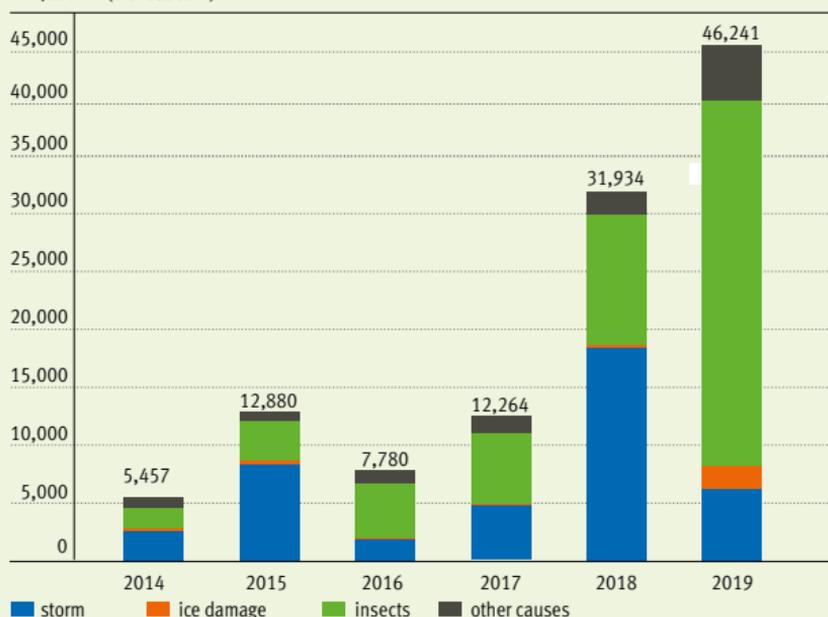
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Fig. 7: Development of tree crown condition in Germany's forests between 1984 and 2020. On average, the crown condition of all tree species in 2020 was worse than ever before.

The forest is subject to abiotic, biotic and human influences. In Germany, windstorms are the most significant abiotic factor for forest damage. Other abiotic factors include snow, ice and (particularly in the past few years) drought. Forest fires, which have only affected approx. 812 hectares per year on average since 1991, are of little significance.

Harvest of damaged timber

in 1,000 m³ (without bark)



Source: Federal Statistical Office (2020)

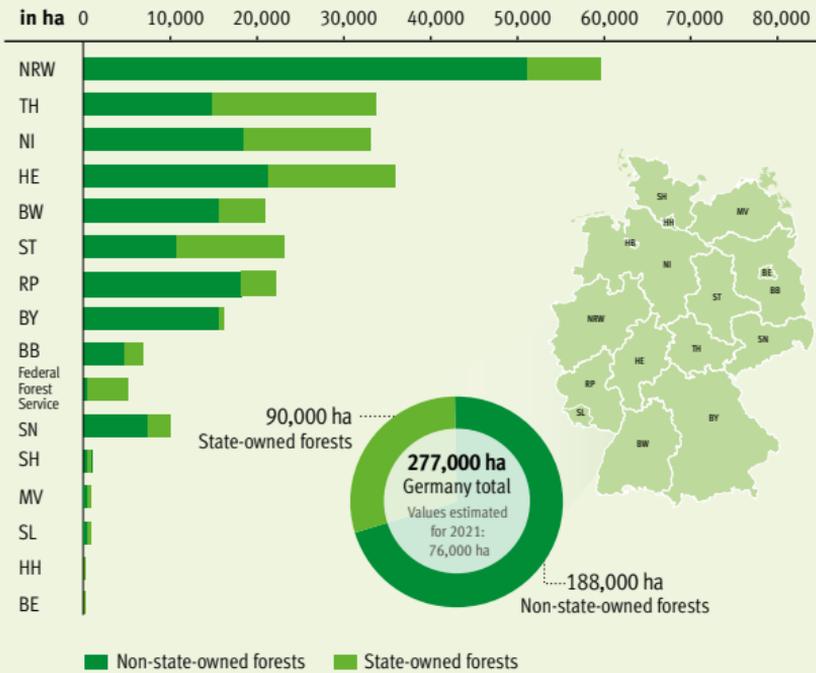
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Fig. 8: The amount of timber harvested due to forest damages has increased drastically between 2014 and 2019. Windstorms and insect calamities following longer periods of drought are the main reason for the increasing damage to forests.

Insect damage is the main biotic factor of forest degradation. Mass reproduction of harmful insects is particularly common after windstorms or years of drought.

Also high populations of game, specifically of roe and red deer, often have a negative effect on forest health by impeding forest regeneration.

Damaged area 2018–2020



Source: Federal Ministry of Food and Agriculture (February 2021)

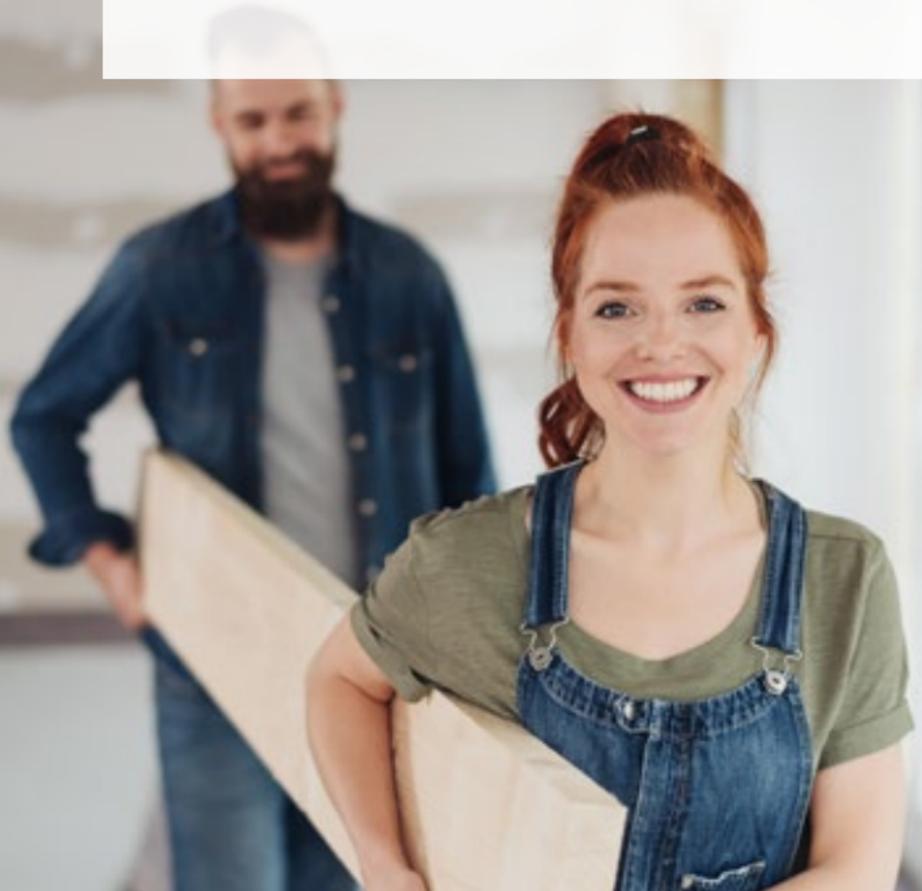
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Fig. 9: Forest area damaged in each German state between 2018 and 2020. The total area of damaged forests in this period amounted to about 277,000 hectares.

Anthropogenic forest damage is primarily caused through air pollution. These factors have declined in recent years.

3

Productive Functions of Forests



Despite the growing importance of other ecosystem services, sustainable timber production continues to play the most important economic role, including for income generation, especially in rural areas. For this reason **the maintenance and encouragement of the production functions of forests** is one of the sustainability criteria of FOREST EUROPE. In Germany, the development of

-  timber harvests,
-  timber values and
-  non-timber forest products

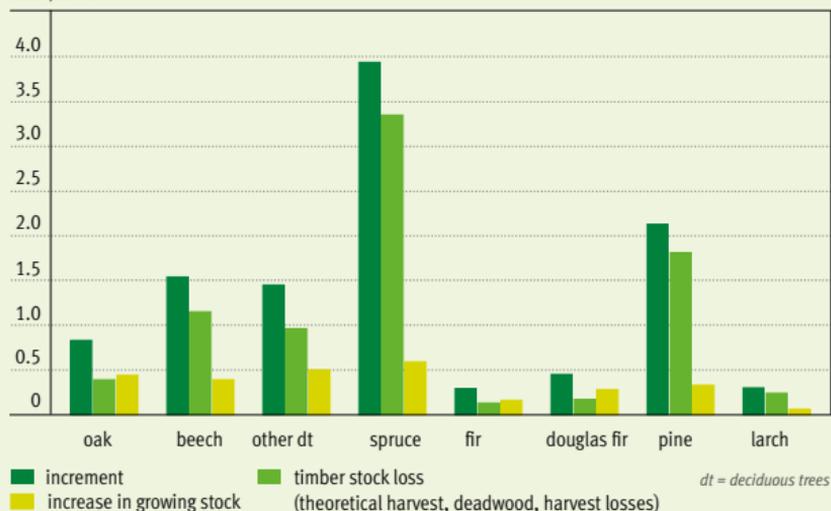
is being continuously advanced.

3.1 Timber Harvest

The third National Forest Inventory calculated an annual wood increment of 122 million cubic metres between 2002 and 2012. During the same period, an average of roughly 76 million cubic metres of timber overbark were harvested per year in Germany.

Timber stock increment and loss: mean annual increment and loss 2012–2017

in m³/ha*a



Source: Thünen Institute, Carbon Inventory (2019)

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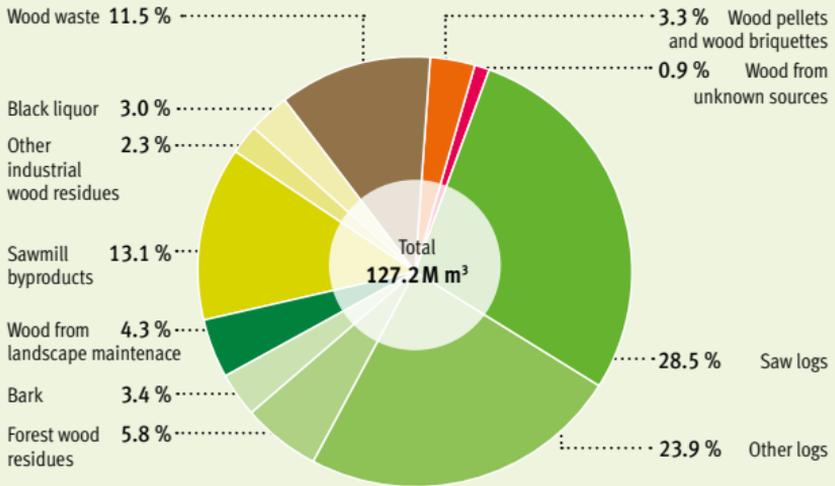
Fig. 10: Mean annual timber stock increment and loss between 2012 and 2017. Overall, the standing timber volume increased between 2012 and 2017.

3.2 The Value of Timber

Since 2014, the average market value for Germany's roundwood production has amounted to over EUR 3.5 billion per year. In Germany, this roundwood is processed into end products for:

-  the construction sector,
-  furniture,
-  packaging and
-  paper.

Classification of wood raw materials in 2016



Source: Information Systems for Resources (INFRO e. K.), Rohstoffmonitoring Holz (2018)

© FNR 2018

Fig. 11: Classification of wood raw materials used in 2016. The majority consists of harvested timber.

The market value of wood increases about tenfold along this value chain. Since 2009, the percentages of the wood used in Germany for material and energy production have remained practically the same. Timber for material and energy production is not only sourced from forests but also from industrial residues, landscaping measures and waste wood. In this context, wood for energy is often the final step in a cascade of uses. The majority of the wood used for energy production in Germany is based on waste wood and sawmill by-products. Only 45 percent is forest-based (solid wood and logging residues).

3.3 Non-Timber Forest Products

The value of non-timber forest products is estimated at around EUR 64 million per year.

The most important non-timber forest uses are hunting and fishing, together with products from these activities, and the leasing of property. Other non-timber forest products include:

-  forest seeds,
-  cuttings for ornamental use,
-  Christmas trees, and
-  the commercial use of mushrooms, berries and other forest fruits.

Since 2001, Germans have the option to bury their deceased in forests. Today, there are more than 150 specially designated Memorial Forests in Germany.

The established forms of non-timber forest use show that other ecosystem services also have the potential to become economically attractive for forest owners in the future. The potential services include:

-  soil conservation,
-  drinking-water provision,
-  carbon sequestration,
-  genetic resources and biodiversity,
-  leisure and recreation



Fig. 12: A raised hide for hunting in the forest. Hunting plays a role in the income of forestland owners, but above all, it helps control the wildlife population.



4

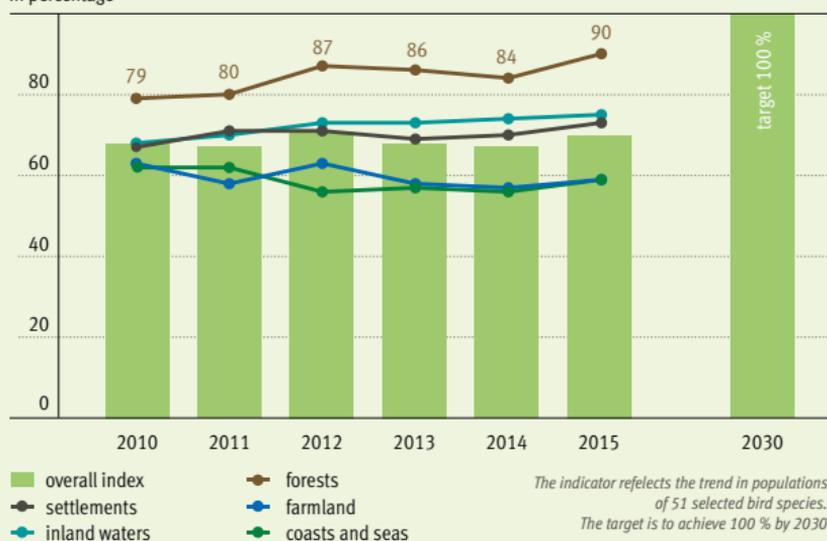
Biological Diversity
in Forest Ecosystems

The intensification of timber production may pose a risk to the ecological functions of the forest. These functions need to be maintained, especially the relatively high biodiversity level of forests that are managed near to nature. This shows that sustainable forest management is inextricably linked to the **conservation, protection and adequate enhancement of biodiversity in forest ecosystems**, as set out in the fourth sustainability criterion of FOREST EUROPE. This criterion can be met through the following concepts:

-  close-to-nature forestry
-  protection forests
-  tree species diversity
-  deadwood
-  specific (micro)habitat and species conservation measures.

Biodiversity and landscape quality

in percentage



Source: Federal Statistical Office, Nachhaltige Entwicklung in Deutschland – Indikatorenbericht (2018)

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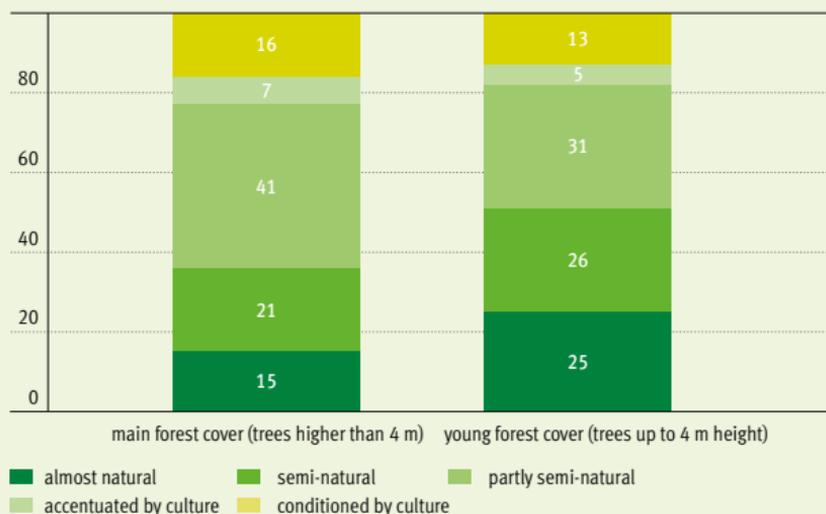
Fig. 13: Biodiversity and Landscape quality between 2010 and 2015. The quality indicator for forests has improved consistently over the years. According to these figures, modern forest management promotes biodiversity.

4.1 Close-to-Nature Forestry

The German forest is the result of thousands of years of varied use and is part of the cultural landscape. Therefore, the country no longer has any pristine forest ecosystems untouched by man. Nevertheless, German forests are close to nature in comparison with other categories of land use. Close-to-nature forestry is implemented in a large percentage of forest areas. This specific management concept includes the following characteristics:

Naturalness of the main and young forest cover in 2012

in percentage



Source: Thünen-Institute, 3rd National Forest Inventory (2014)

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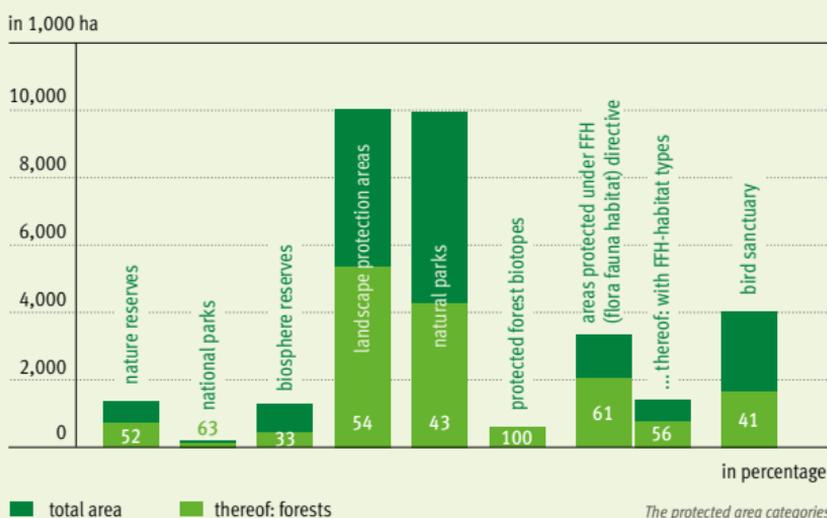
Fig. 14: Naturalness of the main and young forest cover in 2012. Over 50 percent of the next-generation forests can already be classified as close to nature.

- 
 adhering to sustainability principles related to the use of wood and soil
- 
 no clear-cutting of areas larger than 1 to 2 hectares
- 
 no uses that are harmful to the soil, including depletion of soil nutrients
- 
 promotion of natural regeneration
- 
 no fertiliser use
- 
 integrated pest management and minimal use of plant protection products
- 
 preservation of biotope trees exhibiting multiple and variable microhabitats
- 
 preservation of deadwood.

4.2 Protected Forests

A significant percentage of German forests enjoy special protection status because they fulfil important landscape, social, natural or biodiversity-related functions. According to the results of the 2012 National Forest Inventory, up to 5.6 percent of German forests (including inaccessible areas) are currently unused, which corresponds to the aim of the “National Strategy on Biological Diversity”.

Forest areas in protected areas



Source: Federal Ministry of Food and Agriculture, Federal Government's Forest Report (2017)

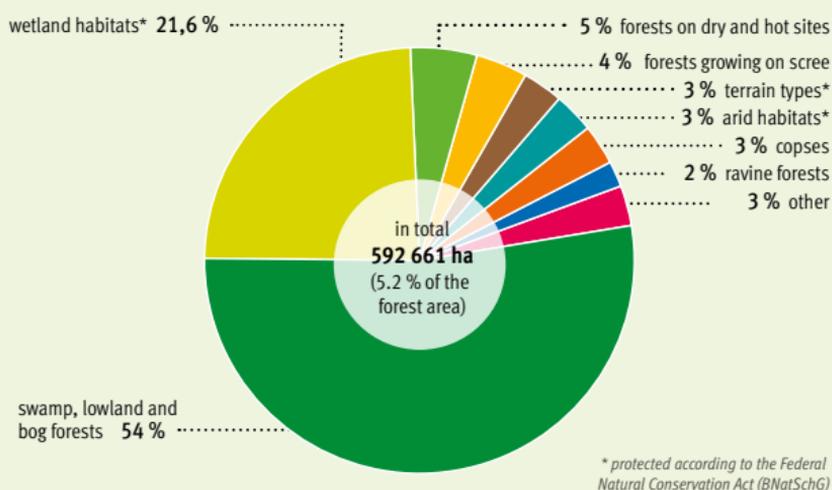
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Fig. 15: Forest areas in protected areas in Germany by type of protection. The categories range from landscape conservation areas, which allow for controlled forest management, to strictly protected national park areas, in which any type of forest use is prohibited.

4.3 Tree Species Diversity

German forests are home to almost 3,000 plant species, including 76 tree species. Due to the ice ages, the variety of tree species in Germany is limited. The four most common tree species are spruce, pine, beech and oak. Together, they account for almost 75 percent of the total forest area.

Specially protected forest biotopes 2012



Source: Thünen-Institute, 3rd National Forest Inventory (2014)

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Fig. 16: Share of specially protected forest biotopes in 2012. The majority of these are located in swamp, lowland and bog forests.



Fig. 17: The European spruce (*Picea abies*) is the most common tree species in Germany, comprising 25 percent of the forest cover. Spruce forests are the result of reforestation efforts in the 19th and 20th centuries.



Fig. 18: The Scots pine (*Pinus sylvestris*) has been planted primarily on sandy and nutrient-poor soils. This species accounts for 23 percent of the country's forested land.



Fig. 19: If Germany's forests were still pristine, beech trees would account for 75 percent of the forest area. Today, the European beech (*Fagus sylvatica*) comprises only 16 percent.

Fig. 20: Oak trees (*Quercus robur*, *Quercus petraea*) make up 10 percent of German forests.



4.4 Deadwood

As an essential biotope for numerous plant and animal species, deadwood is an important structural element of our forests. Some 1,400 of the roughly 6,500 species of beetles in Germany are dependent on deadwood as a habitat.

Deadwood is a carbon pool, which contributes to climate protection, until the carbon is released through the decomposition processes. Germany's forests contain nearly 240 million cubic metres of deadwood; this is equivalent to 22.3 cubic metres per hectare. In recent years, this number has risen steadily.

In Germany's forests, there are an average of nine trees per hectare that exhibit ecologically significant characteristics (e.g. woodpecker nest cavities). These trees are permanently left for natural development. In total, there are more than 93 million so-called 'biotope trees' (Biotopbäume) in Germany.



4.5 Threatened Species

One aim of sustainable forest management is the preservation of specific forest biotopes and species. This is carried out by so-called integrative nature conservation in forests whereby the regular management is adapted to the need for protective measures. In special cases, this is also achieved by placing areas under total protection.

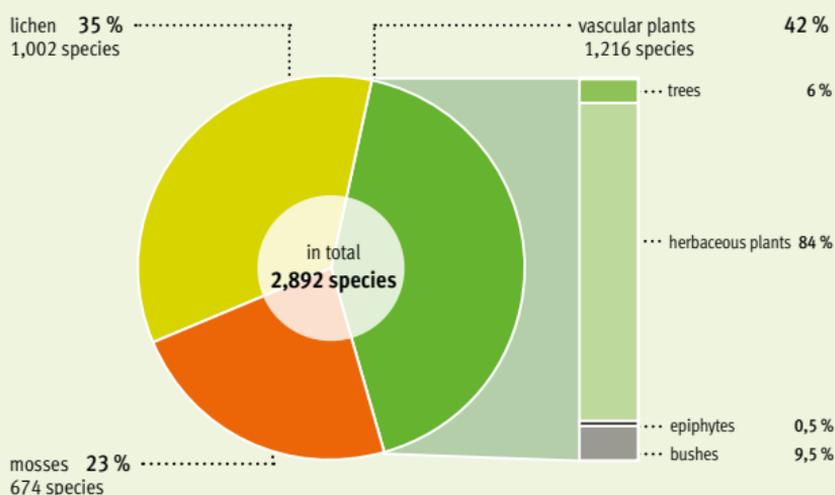
However, there are also numerous influences from outside forests that can have adverse effects on the population of certain species. These influences include:

- the input of substances
- climate change
- invasive species
- fragmentation of forest areas caused by physical infrastructure (e.g. roads, railway lines, overhead wires and conduits).



Fig. 21: The term “deadwood” refers to the non-living woody biomass standing or lying on the forest floor that plays a role in the forest ecosystem.

Biodiversity of forest plants



Source: Federal Agency for Nature Conservation, Waldartenlisten der Farn- und Blütenpflanzen, Moose und Flechten Deutschlands (2011)

© FNR 2019

Fig. 22: Biodiversity of forest plants in Germany. Forests are home to 2,892 plant species, including 51 tree and 116 bush species.

An example of the success of integrative nature conservation in forests is the positive development of threatened species. For example, the wildcat in Germany has been able to recapture some of its natural habitats once again. Its population has increased to an estimated 5,000 to 7,000 individuals. Furthermore, the increasing volume of deadwood has had a positive effect on beetles that rely on deadwood as a habitat.



Fig. 23: Red deer, wildcats and pygmy shrews are some of the 140 different species of vertebrates and countless species of micro-organisms that live in Germany's forests. Most of them might seem inconspicuous, but they play essential roles in the ecosystem.



5

Ecosystem Services

Forests fulfil a wide range of services for our society. They provide us with timber, protect our natural resources and us from natural hazards and provide space for recreation. In our daily life, we take these services for granted, often without paying much attention to them. FOREST EUROPE summarised these ecosystem services in the fifth sustainability criterion: **maintenance, conservation and appropriate enhancement of protective functions in forest management (notably soil and water)**. There is a good reason why forests are referred to as earth's "green lungs", as large "water pumps" and as "climate regulators". They cover the earth like a large coat, filter the air with their foliage and penetrate the earth with their roots. In this way, they offer regeneration, storage, protection and filter functions for

-  soils,
-  water,
-  air and
-  the climate.

5.1 Soil

Forests protect the soil. With the roots of their plants, they not only loosen the soil, but also hold it in place with this gigantic network, preventing

- rockfalls and
- avalanches while
- providing protection from erosion caused by water and wind.

Trees and shrubs are effective windbreaks. Wind begins to slow down when it reaches the forest edge, which protects the forest soil from eroding. The area of reduced wind intensity even extends to large areas before and behind the forest edge (up to approx. 500 m). In the German Alps alone, nearly 150,000 hectares of woodland are designated protection forests (see Ch. 4.2).

Fig. 24: Roots stabilise the soil on slopes, providing protection against erosion.



5.2 Water

Forest soils represent the largest freshwater reservoir in Germany. Up to 200 litres of water can be collected under a single square metre of forest floor. The soil not only stores water: it also filters and purifies this water as it moves through the ground layers.

-  A total of 98.3 percent of the water that comes from forests is safe to drink.
-  Water protection areas usually include forested land: over 40 percent of the land designated as water protection areas in Germany is forested.
-  Approx. 2.1 million hectares of forests are drinking water protection areas.

Forests retain rainwater, thus reducing flood runoff after heavy rainfalls and the risk of flood damage. Riparian forests play a particularly important role in river systems. They protect river dams from ice and debris.



Fig. 25: Forests produce oxygen, filter air and regulate the water cycle.

5.3 Air

Forests are natural air filters. Thanks to the large surface area of their leaves and needles, trees are able to filter dust and other air pollutants from the atmosphere.

Trees produce oxygen. Every year, German forests release a total of

 approx. 25 to 38 million tonnes of oxygen.

This volume of oxygen is between one and one and a half times the amount that the entire population of Germany needs to breathe each year.

Every year, a single hectare of woodland filters up to 60 tonnes of dust. This is why the air in forests is extremely clean. It contains up to 100 times less dust than the air in large cities. The essential oils and aromatic substances from trees are beneficial to health and have a relaxing effect on the mind and body. This is why so many people are attracted by forests to pursue their fitness, health and recreational activities.

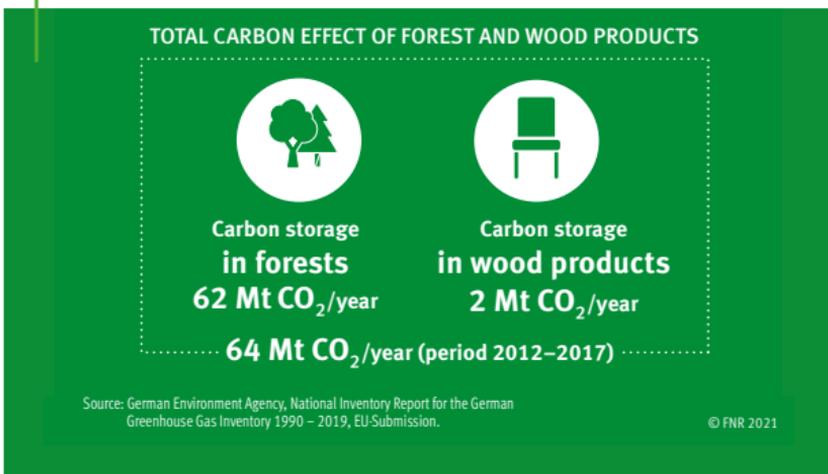
5.4 Climate

The main benefit that forests provide for the climate is their contribution to climate change mitigation. This total climate effect of forest and timber consists of the amount of carbon stored in forests and wood products, as well as the substitution of conventional materials and fuels. For Germany, the storage effect amounts to 64 Mt CO₂-equivalents per year (period 2012–2017). The substitution potential is estimated between 28 and 53 Mt CO₂-equivalents.

Schulze, E.-D. et al (2021). Climate mitigation by forests: *Biologie in Unserer Zeit*, 51(1), 46–54.

Additionally, forests provide protection from solar radiation through their canopies and are also able to actively cool their surrounding area and affect the water cycle through evapotranspiration. The temperature differences between forests and urban areas result in a constant exchange of air. Cooler, oxygen-rich fresh air is pulled out of the forest into the urban space. On hot summer days, the air in the forest is up to 6 degrees cooler on average than in cities.

Fig. 26: The climate effect of forest and wood products amounts to 64 Mt CO₂-equivalents/year.





6

The Socio-Economic
Relevance of Forests

In addition to their productive and ecological functions, forests also play an important role in the livelihoods of people. Approximately half of Germany's forest area is privately owned. The forestry and timber sector is one of the largest economic clusters in Germany. However, forests are also locations for tourism and hunting. Accordingly, the **maintenance of other socio-economic functions and conditions** is the sixth sustainability criterion of FOREST EUROPE. This criterion covers various aspects, including:

-  a diverse structure of forest ownership,
-  a sustainable demand for wood,
-  the forest as a place of employment and
-  the forest as a location for recreation.

6.1 Forest Ownership

In contrast to many other countries of the world, the forest in Germany belongs for the most part to the citizens and the cities and municipalities, which have a constitutionally protected right of disposition. In Germany, forest ownership has not only material, but above all also high idealistic value.

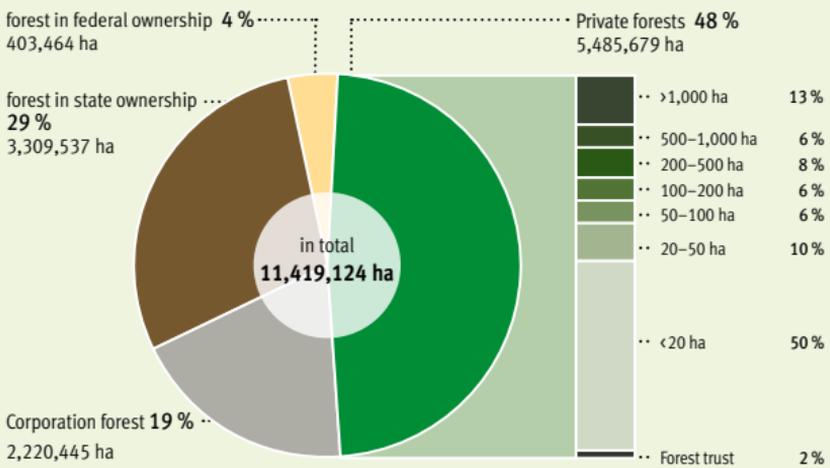
Many forests have been in the hands of family and private forestland owners and entities, such as churches, for generations.

-  Owners with fewer than 20 hectares hold about half of the privately owned forest area.
-  Approx. 13 percent of private forestland belongs to owners with more than 1,000 hectares.
-  Owing to the large number of owners with very small areas of woodland, the average size of privately owned forest property in Germany is 2.5 hectares.

For the owners of small forests, forestry cooperatives play a significant role to ensure their self-determined forest management. Forestry cooperatives enable them to generate profits from their property in spite of fragmented ownership structures. In Germany, there are currently around 3,500 forestry cooperatives with approx. 430,000 members. They manage a total of over 3.5 million hectares of forestland.

Another opportunity for forest owners to receive guidance is through state foresters. They provide forest owners not only with valuable advice and recommendations but are also responsible for the enforcement of forest related laws.

Forest area by type of ownership



Source: Thünen-Institute, 3rd National Forest Inventory (2014)

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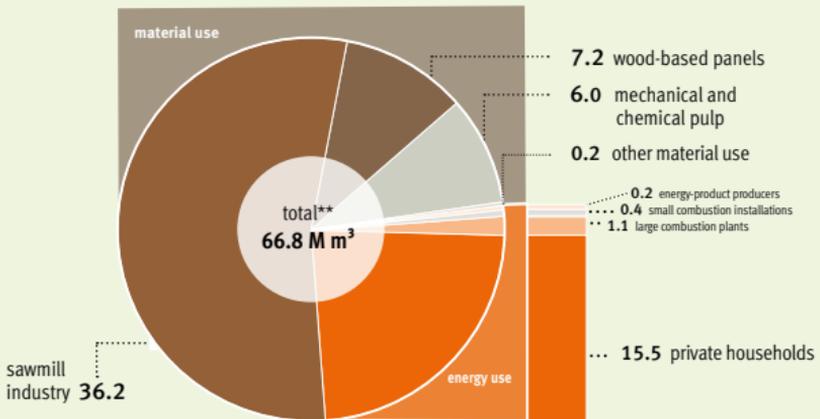
Fig. 27: Forest area by type of ownership. Property size categories are shown for privately owned forests. Nearly half of Germany's forests are privately owned. Most of this land is fragmented into small properties.

6.2 Wood Consumption

The annual per capita wood consumption in Germany amounts to about 1.5 m³. The use of wood and wood products addresses significant societal needs, ranging from wooden cooking spoons, paper and pellets to furniture, packaging and timber construction. These uses, along with product innovations in the fields of textiles, plastic products or cosmetics, are spurring the increasing demand for wood. Hence, wood

Use of timber* in 2016

in million m³



* Only timber with a diameter of at least 7 cm is accounted for. Bark and logging residues are not included. The annual use of logging residues (branches, needles, tree crowns, tree stumps and roots) is about 7.4 million m³. Of this amount 3.5 million m³ are used as firewood in private households.
 ** estimated value

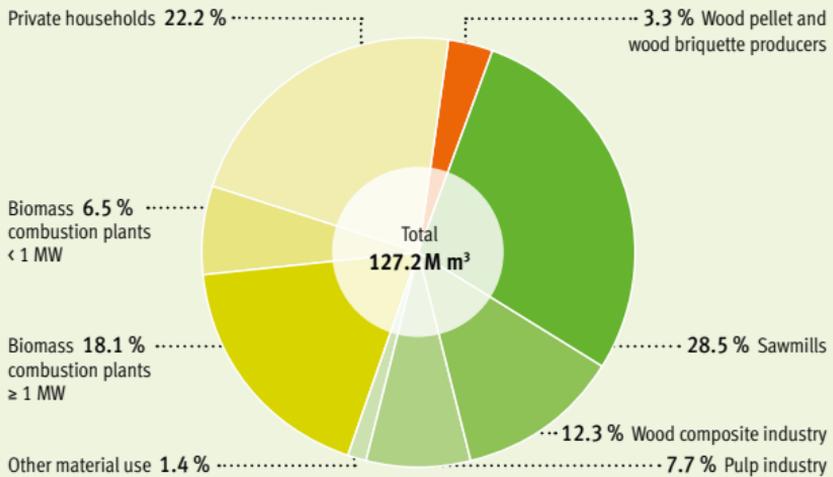
Source: Mantau, Rohstoffmonitoring Holz – mengenmäßige Erfassung und Bilanzierung der Holzverwendung in Deutschland (2018)

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Fig. 28: Use of harvested timber in 2016. Around 75 percent of the harvested timber is processed for material use and 25 percent for energy use.

significantly contributes to revenue, employment and value creation – especially in rural areas, and constitutes an important component of the bioeconomy. Furthermore, long-lasting wood products, the cascading use of wood and the substitution of non-renewable materials contribute directly to climate change mitigation.

Use of wood raw materials according to user groups in 2016



Source: Information Systems for Resources (INFRO e. K.), Rohstoffmonitoring Holz (2018)

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Fig. 29: Use of wood raw materials in 2016 by user group. The total wood consumption in Germany is 127 million m³ (total wood use comprising roundwood, wood cuttings from landscaping, wood from short rotation plantations, waste wood and black liquor, as well as the net imports of wood products).

6.3 Economic Relevance

In terms of turnover and employment, the timber and forestry sector represents one of the leading sectors of Germany's economy. It employs roughly 750,000 people, includes more than 100,000 com-

Forestry and timber cluster in Germany in 2018

Forestry

Wood processing industry

Woodworking enterprises

Timber construction

Paper industry

Timber trade

Forestry and timber cluster total

Fig. 30: Number of businesses and employees, as well as revenue generated by the German timber and forestry cluster. The timber and forestry cluster is one of the leading sectors of Germany's economy.

panies and generates an annual turnover of approx. EUR 130 billion. Domestic forestry is the most important source of raw materials for the downstream branches of the timber industry.

enterprises	total employees
33,717	90,374
3,010	44,740
22,366	229,400
40,012	220,350
2,101	131,958
2,353	17,637
103,559	734,459

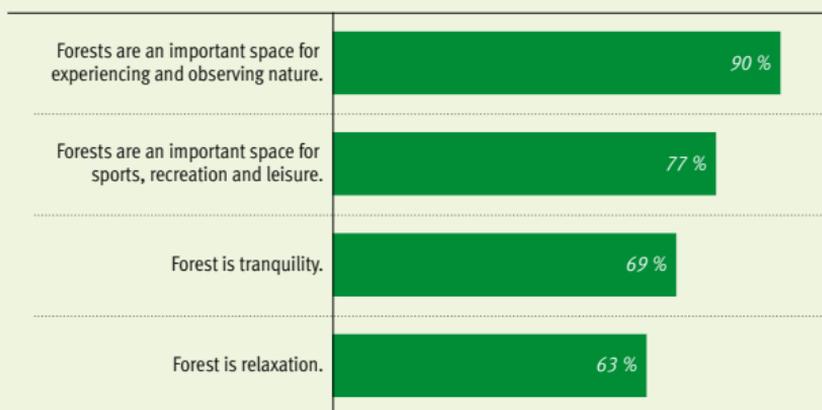
Source: Thünen Institute of International Forestry and Forest Economics, official statistics

6.4 Recreation

In Germany, people are granted the universal right to access forests for recreation at any time and at no cost. There are only a few forest areas exempt from this right. More than 90 percent of German citizens make use of this right on a regular basis. For 90 percent of Germans, the forest is an important place for experiencing nature and for 77 percent it is a location for sports, recreation and leisure. However, costs associ-

Recreation in forests

Answers from the BMEL Forest Survey on German citizens' opinions on forests and forestry



Source: Federal Ministry of Food and Agriculture, Federal Government's Forest Report (2017)

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Fig. 31: Germans value forests, particularly as natural areas, and use them for recreational activities.

ated with the provision of these ecosystem services in communal forests (owned by public sector entities, such as municipalities) amount to approx. EUR 150 million per year. They are born by revenues from timber sales. Providing these services is a deeply rooted desire of politics and society. They are associated with the high quality of life in Germany.

Leisure activities in forests

On average, a visit to the forest takes almost two hours. On a weighted average, each German citizen visits a forest 28 times per year for recreational purposes. Overall, 68% visit a forest at least once a month and 29% at least three times a month.

at least 3 visits/month	29 %
at least 1 visit/month	68 %
thereof	
walking/hiking	82 %
nature observation	45 %
foraging for mushrooms/berries	26 %
jogging/running	20 %
exploring nature with children	17 %
dog walking	17 %
cycling	17 %
others (geocaching, horse riding, etc.)	12 %

Source: BMEL, Federal Government's Forest Report (2017)

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Fig. 32: Leisure activities in German forests by number of forest visits per year and type of activity. German citizens' right to enter forests is guaranteed by law.

7

German Wood- processing Sector in an International Context

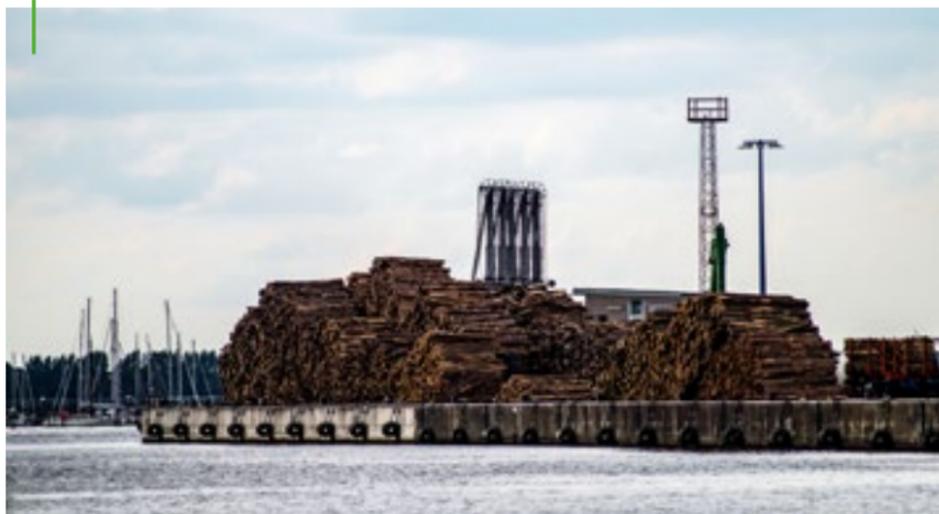


Some of the ecosystem services provided by forests only come into effect through sustainable timber production. Wood-processing businesses are important partners in this regard. They are essential for making long-term uses of sustainably harvested timber possible.

Furthermore, Germany's wood-processing businesses play an important role in strengthening the economic fabric of rural areas. Owing to their extensive integration into international markets, they secure jobs and support value creation in Germany.

German foreign trade with wood and wood products is primarily based on the trade relationships with its neighbouring countries (40 to 60 percent). With the other EU countries included, the share of both imports and exports increases to approx. 80 percent.

Fig. 33: Germany is one of the largest exporters of wood and wood products worldwide.

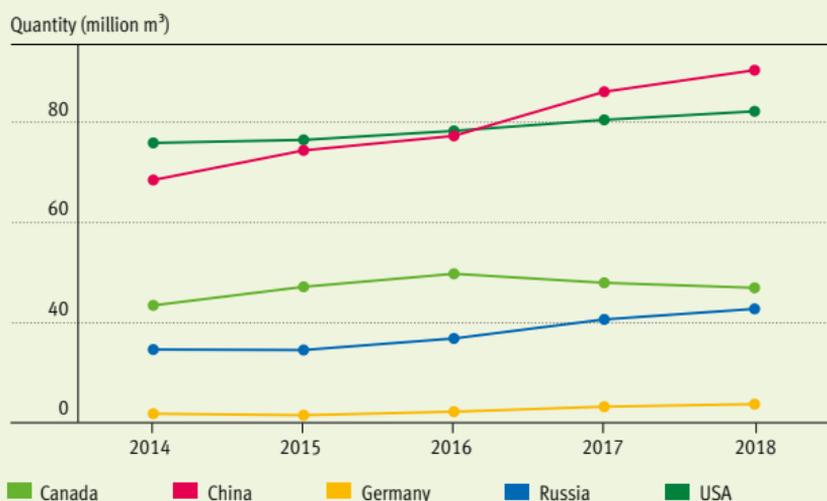


In international comparison, Germany is the third largest exporter of wood and wood products, after China and the US (in terms of value). At the same time, Germany has been a net importer of coniferous roundwood since 2009.

Worldwide, around 155 million cubic metres of **sawnwood** were traded in 2018.

The German sawmill industry is made up of roughly 2,000 companies with about 25,000 employees. They produce around 24 million cubic meters of

Sawnwood production



Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

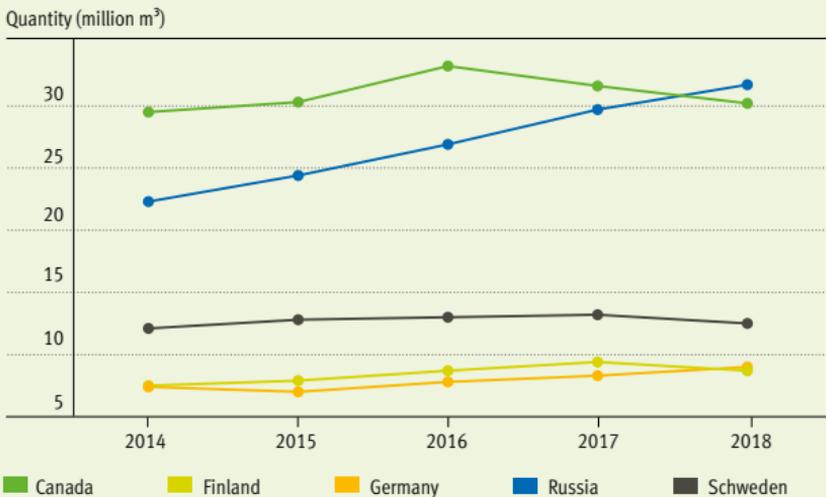
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Fig. 34: Sawnwood production of the five largest producers of sawnwood: China, USA, Canada, Russia and Germany between 2014 and 2018. Together these countries produced more than half of the global sawnwood production in 2018 (286 million cubic metres).

sawnwood annually. To achieve this, they process nearly 37 million cubic metres of roundwood. The main customer for this timber (approx. two-thirds) is the construction industry.

The annual turnover of the sawmill industry is roughly EUR 6.5 billion. Contributing to this output is a high export rate of nearly 38 percent, which is equivalent to around 9 million cubic metres per year. This makes Germany one of the five largest exporters of sawnwood worldwide.

Sawnwood exports



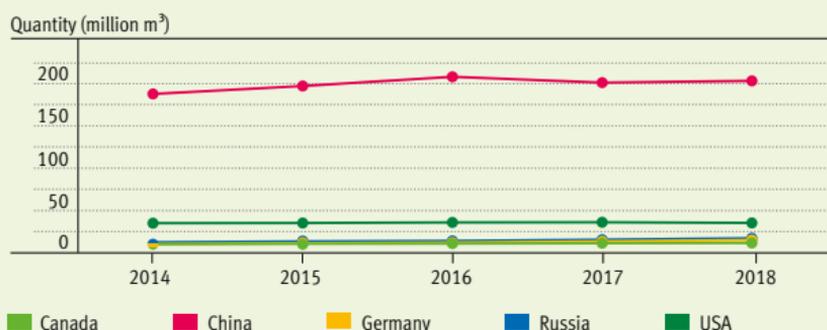
Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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Fig. 35: Sawnwood exports of the five main exporting countries between 2014 and 2018. Three of the largest producers of sawnwood are also among the largest exporters (Canada, Russia and Germany). Together with Sweden and Finland, they exported roughly 92 million cubic metres of sawnwood in 2018. This figure is equivalent to more than half of all exports worldwide.

Global **wood-based panel** production reached around 408 million cubic metres in 2018. Types of wood-based panels include fibreboard, particle board, oriented strand board (OSB) and solid wood panels. Germany's wood-based panel industry comprises around 100 companies with 13,500 employees. With a total annual

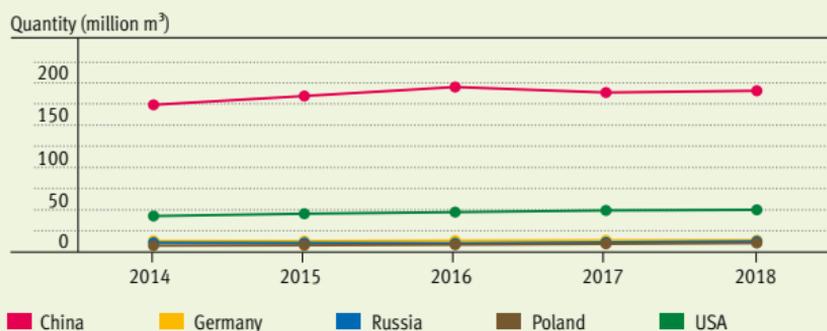
Wood-Based Panels – Production



Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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Wood-Based Panels – Consumption



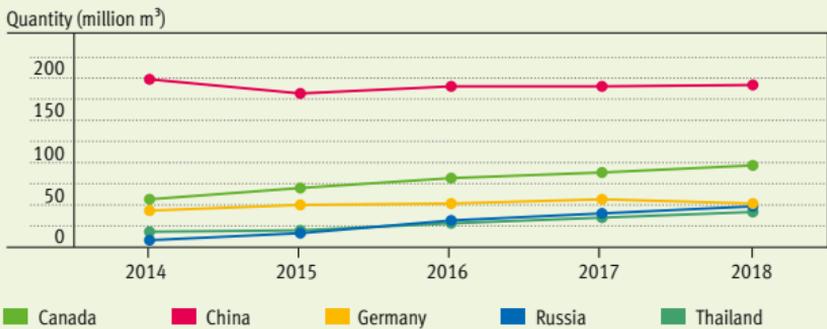
Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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Fig. 36: Production, consumption, import and export of wood-based panels for the respective five leading countries between 2014 and 2018. By 2018 Germany found itself in each of these

production of 10.5 million cubic metres, they generate a turnover of approx. EUR 5 billion per year. The wood-based panel industry uses around 15 million cubic metres of wood raw materials. Half of this is from sawmill residues as well as waste and recycled wood.

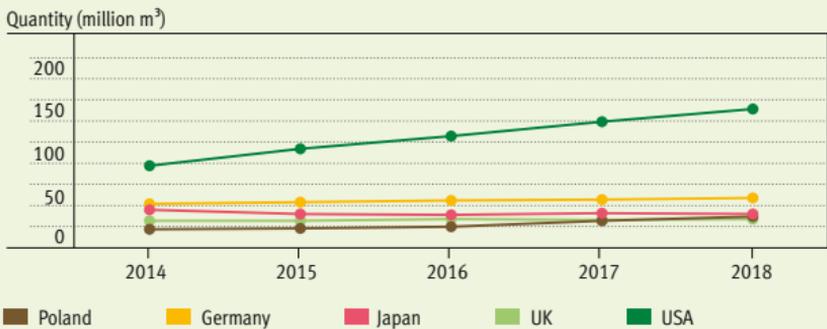
Wood-Based Panels – Exports



Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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Wood-Based Panels – Imports



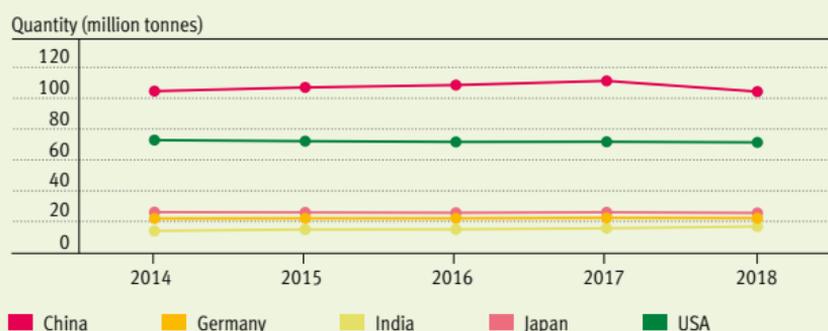
Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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groups. It is noteworthy that, in the production of wood-based panels, Germany is on par with heavily forested Canada.

In 2018 around 409 million tonnes of **paper products** were produced worldwide. In Germany, more than 100 companies with roughly 40,000 employees generate a total annual turnover of approx. EUR 14 billion. These companies produce nearly 23 million tonnes

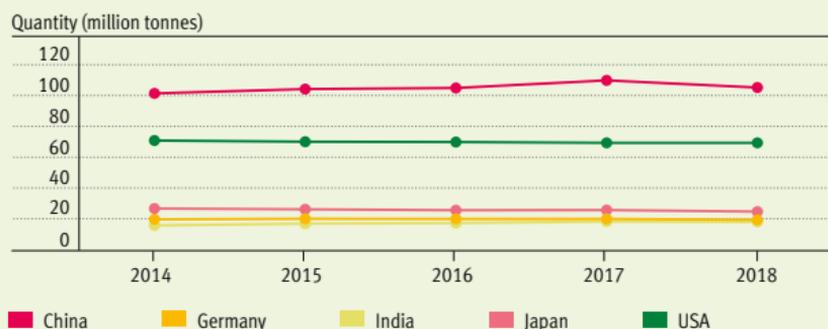
Paper & Paperboard – Production



Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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Paper & Paperboard – Consumption



Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

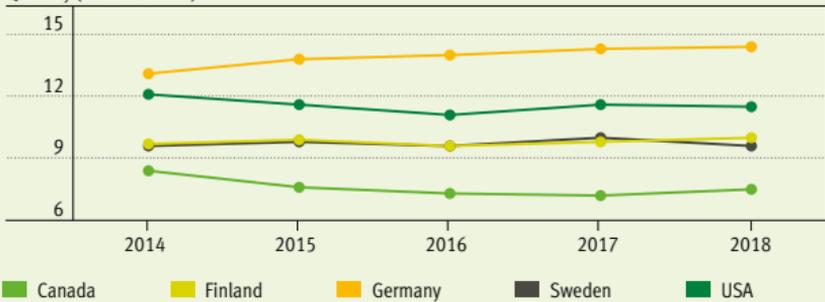
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Fig. 37: Production, consumption, import and export of paper and paperboard for the respective five leading countries

of paper and paperboard from around 4.6 million tonnes of pulp and 17 million tonnes of waste paper. This makes Germany the largest paper producer in Europe.

Paper & Paperboard – Exports

Quantity (million tonnes)

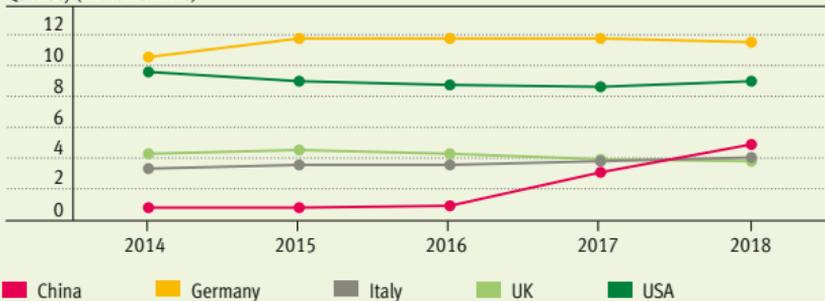


Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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Paper & Paperboard – Imports

Quantity (million tonnes)



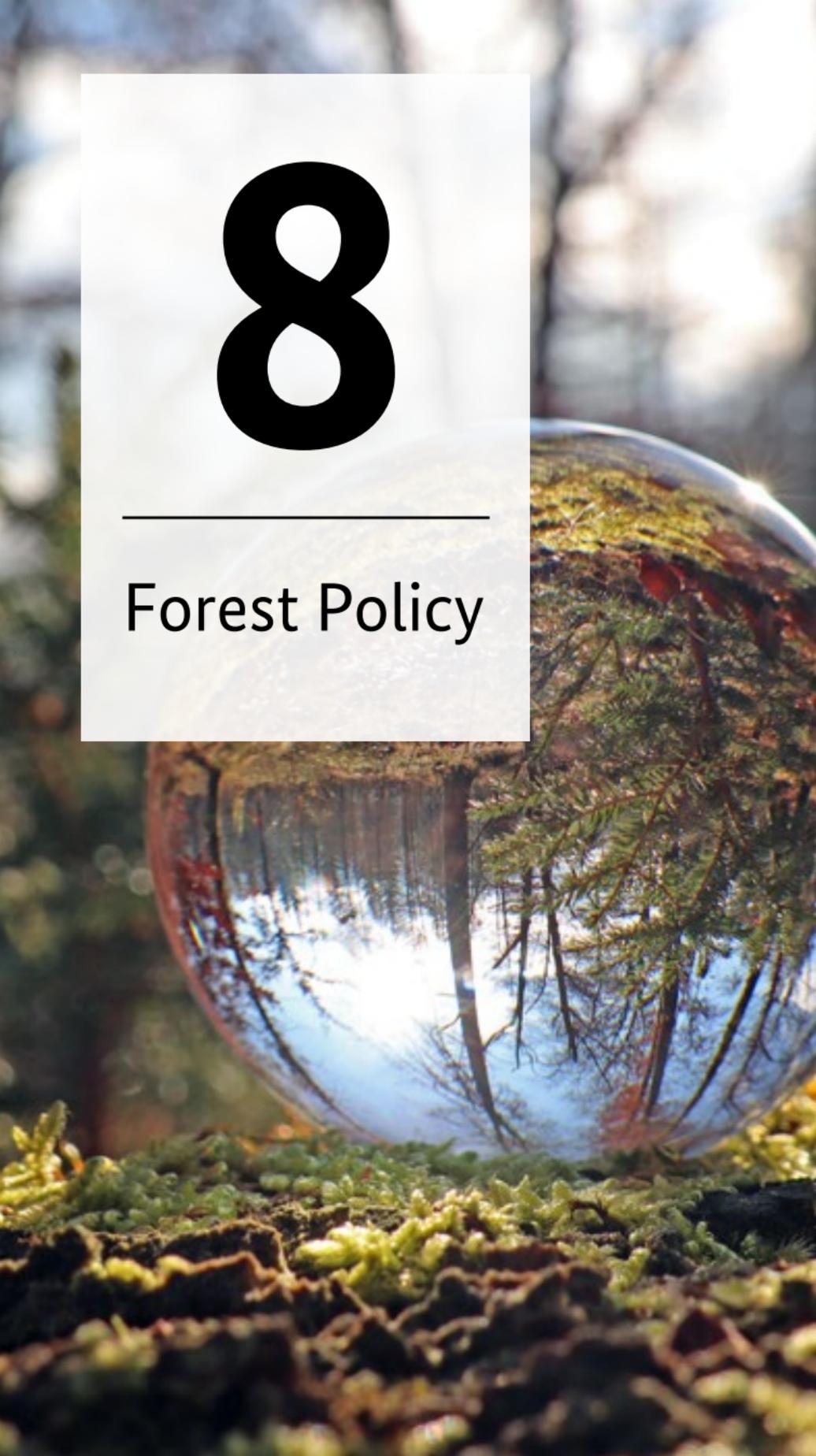
Source: FAO, FAO Yearbook of Forest Products 2018 (2020)

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between 2014 and 2018. Germany stands out as the world's largest importer and exporter.

8

Forest Policy



Facing climate change, supplying timber in a sustainable manner, promoting the bioeconomy, conserving and enhancing biodiversity and providing attractive recreational sites – those are the key challenges that society must face regarding its forests. The German Federal Government tries to balance the various demands of society imposed on forests through the Federal Ministry of Food and Agriculture (BMEL).

8.1 Political Structure

Germany is a federal nation with a clear division of powers between the states and the federal government. Forest management and nature conservation lie within the responsibility of the federal states. The federal government sets the framework conditions for forests, forestry operations and the timber industry. The Federal Ministry of Food and Agriculture is responsible for forest policy on the federal level.

8.2 Federal Forest Act

The Federal Forest Act, together with state forest legislation, protects German forests and their ability to provide ecosystem services. Since 1975, the Federal Forest Act has been repeatedly amended to reflect the changing conditions and requirements.

SECTION 1 FEDERAL FOREST ACT

The purpose of this act is, in particular,

- 1.** to conserve forests due to their economic benefits (productive function) and importance for the environment, with respect, in particular, to maintaining the performance and functioning of the natural balance, the climate, the water balance, the prevention of air pollution, the soil fertility, the landscape features, the agriculture and infrastructure and the recreational function for the people (functions relating to both protection and recreation), if necessary to enlarge the forest area and to ensure its sustainable and ordered management,
- 2.** to promote the forestry sector and
- 3.** to reconcile public interests and the concerns of forest owners.

The Federal Forest Act is an important foundation for forest policy in Germany.

Other federal laws that are relevant to forest management include:

-  The Forest Reproductive Material Act (FoVG): this law regulates the production of and trade in forest reproductive material.
-  The Timber Trade Protection Act (HolzSiG): this law regulates the national controls of timber imports from countries that have signed partnership agreements with the EU against illegal logging as well as the national implementation of the EU Timber Trade Regulation with its due diligence provisions for placing timber on the market.
-  The Federal Hunting Act (BJagdG): this law regulates hunting rights and lays down provisions on the practice of hunting.
-  The Act on Nature Conservation and Landscape Management (Federal Nature Conservation Act – BNatSchG): this law is the national legal basis for nature conservation and landscape management.

8.3 Forest Strategy 2020

The Forest Strategy 2020 addresses all forest-related stakeholders at national and state level. The existing challenges and opportunities, possible conflicting goals and potential solutions are analysed and identified in nine areas of action:

-  Climate protection and adaptation to climate change
-  Property, work and income
-  Raw materials, use and efficiency
-  Biodiversity and forest conservation
-  Silviculture
-  Hunting
-  Protection of soil and water management
-  Recreation, health and tourism
-  Education, public relations and research

The Federal Ministry of Food and Agriculture will develop the Forest Strategy 2050 based on this strategy.

8.4 Charter for Wood 2.0

The Charter for Wood 2.0 is a stakeholder platform that was initiated by the Federal Ministry of Food and Agriculture to strengthen the use of wood sourced from sustainably managed forests. Its objectives are

-  mitigating climate change,
-  utilising resources efficiently and
-  creating value in rural areas.

It represents a milestone in the Federal Government's 2050 Climate Action Plan.

8.5 Financial Support Schemes

The federal and state governments manage financial aid provided to communal and privately owned forests jointly. Funding is provided for close-to-nature forest management, forest infrastructure, forestry cooperatives, afforestation and nature conservation measures in the forest, as well as for dealing with the consequences of extreme weather. In addition to joint funding, several states have introduced their own complementary funding programmes, some financed solely by the respective state and others with EU-cofunding.

8.6 Other Relevant Policies

The aim of the **National Strategy on Biological Diversity** is to halt the decline in biodiversity.

The **Climate Action Plan 2050** is a framework strategy for modernising the national economy of the German Federal Government and provides guidance to achieve the domestic climate targets in line with the Paris Agreement and its goal for greenhouse gas neutrality. Specific implementation actions are spelled out in the **Climate Action Programme 2030** and the **Climate Change Act**, and include measures on the mitigation potential in the conservation and sustainable management of forests and the use of timber.

The Federal Government adopted its **National Bioeconomy Strategy** in 2020 in order to lay down the guidelines and targets for its bioeconomy policy and identify measures for their implementation. The United Nation's Sustainable Development Goals provide an important framework.

8.7 International Forest Policy

The Federal Government is an important actor in practically all international processes. One of its crucial goals is to promote more coherence in international forest policy in order to increase the overall effectiveness of international and multilateral forest-related plans, programmes and actions to conserve, sustainably manage and restore forests worldwide. The Federal Ministry of Food and Agriculture is lead coordinator of international forest policy within the German government.

The Federal Ministry of Food and Agriculture also supports pilot projects in partner countries for capacity building, **research cooperation and knowledge transfer** in the area of sustainable forest management.

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