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Forests at the heart of sustainable development

Investing in forests to meet biodiversity and climate goals

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Contents

Abbreviations

AFOLU	Agriculture, forestry and other land-use
AI	Artificial Intelligence
CAES	Climate Action and Environmental Sustainability (EIB)
CAB	Climate Awareness Bonds (EIB)
CAP	Common Agriculture Policy (EU)
CBA	Climate Benefit Analysis
CBR	Climate Bank Roadmap (EIB)
DNSH	Do No Significant Harm (EU Taxonomy)
EC	European Commission
EE	Energy Efficiency
EU	European Union
EUTR	EU Timber Regulation
EFI	European Forest Institute
EIAH	European Investment Advisory Hub
EIB	European Investment Bank
EUFS	European Forest Strategy 2030
ESG	Environmental and Social Governance
ESSF	Environmental and Social Sustainability Framework (EIB)
EWP	Engineered Wood Products
FAO	Food and Agriculture Organization of the United Nations
FAP	Forestry Advisory Programme (EIAH)
FLR	Forest Landscape Restoration
FLRM	Forest Landscape Restoration Mechanism
FMP	Forest Management Plan
FPIC	Free, Prior and Informed Consent
FTE	Full-Time Employment
GHG	Greenhouse gases
GMO	Genetically Modified Organisms
GVA	Gross Value Added
HA	Hectare
HCV	High Conservation Value
IFI	International Financial Institution

IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
KPI	Key Performance Indicators
LDD	Land degradation and desertification
LDN	Land Degradation Neutrality
LDN-TSP	Land Degradation Neutrality Target Setting Programme
LULUCF	Land use, Land Use Change and Forestry
MBIL	Multiple Beneficiary Investment Loan (EIB)
MDB	Multilateral Development Bank
MS	Member State of the European Union
NbS	Nature-based Solutions
NCFF	Natural Capital Financing Facility
NTFP	Non-Timber Forest Products
PES	Payment for Ecosystem Services
RDI	Research, Development and Innovation
RE	Renewable Energy
SAB	Sustainability Awareness Bonds (EIB)
SC	Substantial Contribution (EU Taxonomy)
SFM	Sustainable Forest Management
SLM	Sustainable Land Management
TLAS	Timber Legality Assurance System
UNCCD	United Nations Convention to Combat Desertification
UNFF	United Nations Forum on Forests

1 INTRODUCTION

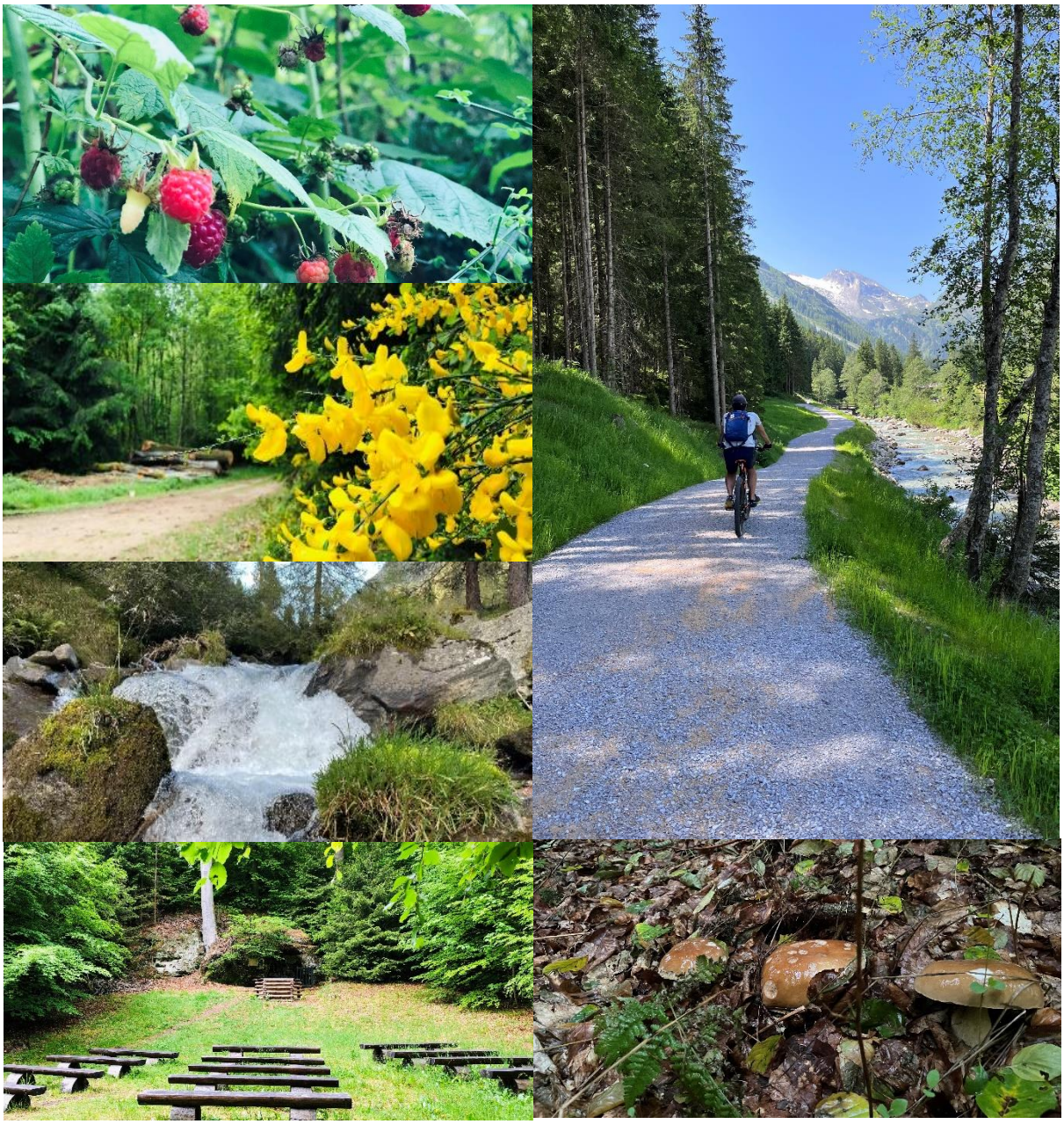
Forests, forestry and forest-based industries are moving towards a sustainable forest-based bioeconomy. The European Green Deal includes the EU Forest Strategy for 2030. This strategy, together with the EU Biodiversity Strategy for 2030, shapes the policy framework for the forestry sector in line with the UN 2030 Agenda for Sustainable Development.

This paper provides an overview of sustainability in the forestry sector. It sets out the benefits for society, describes the regulatory environment and examines the challenges encountered by companies and investors operating in this sector. Finally, it addresses the role of public banks in helping to develop the sector.

1.1 Forests at the heart of climate, environmental and biodiversity sustainability

Forests are dynamic and open ecosystems. They provide a natural habitat for a vast range of animals, plants and other living organisms, allowing them to thrive. In terms of their own functioning, forests embed the principle of circularity. They provide commercially valuable renewable wooden materials and goods, regulate critical global cycles (in particular the oxygen, nitrogen, carbon and water cycles) and play a vital role in soil conservation.

Furthermore, forests play an indispensable **multifunctional role** in climate, environment and biodiversity protection. They provide a variety of important **ecosystem services**, such as clean air; water flow regulation and flood control; carbon sequestration and storage; soil protection from water and wind erosion; and natural resilience to the effects of climate change.



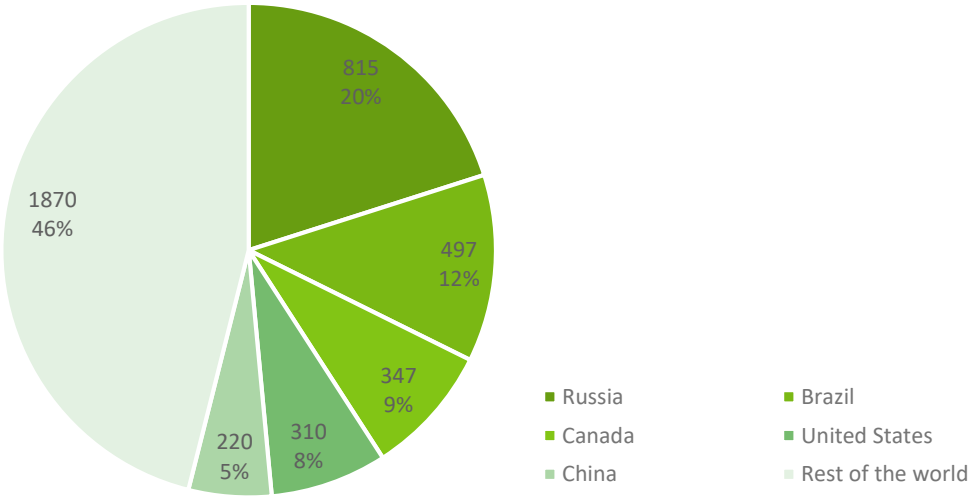
Forests protect livelihoods, communities and infrastructure. They contribute to the **sustainable development of rural economies**, which promotes integrated territorial development and economic and social cohesion, and is vital to the well-being of rural communities. Forests provide subsistence, employment opportunities and income to about 25% of the world's population.

Forests have a high **recreational and amenity value**. This comes from non-timber forest products, such as mushrooms and wild berries, outdoor recreation and culture, such as sports and various forms of tourism, which contribute to human health, well-being and enjoyment, biodiversity, social and economic benefits for communities.

The multifunctional role of forests is strengthened by the **production of renewable wood materials** in the (circular) **forest-based bioeconomy**. Renewable wood materials **substitute for fossil-based alternatives**, thus also contributing to climate neutrality and environmental sustainability.

Forests cover about 4 billion ha (30% of the earth's land mass) and host about 80% of the world's biodiversity. Primary forests[1] cover about 1 billion ha. More than 700 million ha of the world's forests are legally protected areas. The tropics host the largest proportion of the world's forests (45%), followed by the boreal, temperate and subtropical regions. Over 90% of the world's forests are naturally regenerating and over 50% are covered by forest management plans or equivalents.

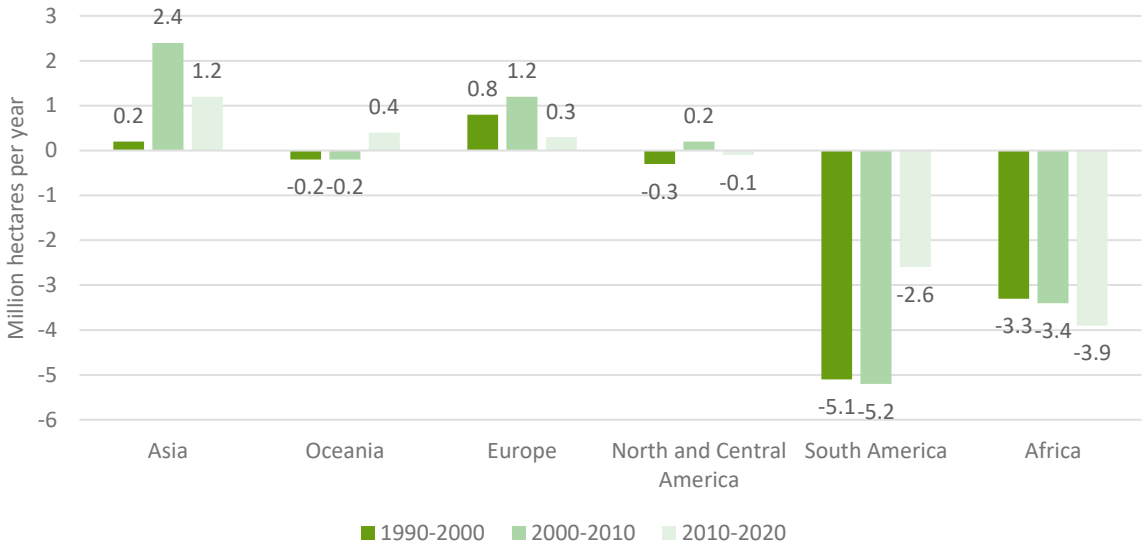
Global distribution of forests, 2020 (million hectares and percentage of world's forests)



Data source: Global Forest Resources Assessments | Food and Agriculture Organization of the United Nations (fao.org)

[1] Primary forests are forests composed of native species in which there are no clearly visible indications of human activity and in which ecological processes have not been significantly disturbed.

Although the world's forests are threatened by deforestation and degradation, the global rate of forest loss has substantially decreased over recent decades. This is mainly due to a reduction in deforestation in certain countries and increases in forest area through afforestation and natural expansion of forests[2] in others. The global forest growing stock is 557 billion m^3, while the forest carbon stock is 658 gigatons of CO_2 equivalent.



Data source: Global Forest Resources Assessments | Food and Agriculture Organization of the United Nations (fao.org)

European forests in EU and non-EU countries cover more than 30% of Europe's land mass[3] (some 227 million ha), an increase of almost 10% since 1990.[4] Europe's forests are expanding, sequestering and storing more carbon, and supplying sustainable wood raw materials to the bioeconomy. The volumes of wood and carbon stored in European forests have grown by 50% over the last 30 years, as forest area and biomass stocks have expanded. European forests currently sequester and store about 155 million t CO_2 equivalent every year. This is equivalent to 10% of the emissions produced by all other sectors in Europe. Carbon stored in harvested wood products also contributes to the reduction of CO_2 emissions. The volume of wood harvests and supply have reached about 550 million m^3 per year, while the total growing stock of European forests has doubled over the last six decades. It now accounts for about 35 billion m^3 of forest biomass.

European forests are predominantly semi-natural forests. The diversity of tree species in European forests has increased over the last two decades. About 50 million ha (or 24%) of European forest land are located in areas protected for the conservation of biodiversity and landscapes. Forests designated for the protection of soil, water and other ecosystem services cover about 72 million ha (32% of European forest land). The health and vitality of European forests are in general terms good and stable. However, some forests are deteriorating as a result of factors that can have a significant negative impact on local forest ecosystems. Key examples are alien or invasive species, pest outbreaks, and climate and anthropogenic disturbances. It is evident that the frequency of large-scale forest disturbances has increased over time and particularly over the last decades. These disturbances are directly or indirectly linked to climate change, including extreme droughts, heatwaves, extensive forest fires, wind fall, as well as insect and disease outbreaks.

[2] Asia and Europe had the highest net gains of forest area between 2000 and 2020.
[3] Forests and other wooded land cover about 180 million ha or about 40% of the EU's land area (Eurostat, 2021).
[4] Forest Europe (2020), *State of Europe's forests 2020*.

1.2 Forestry sector sustainability

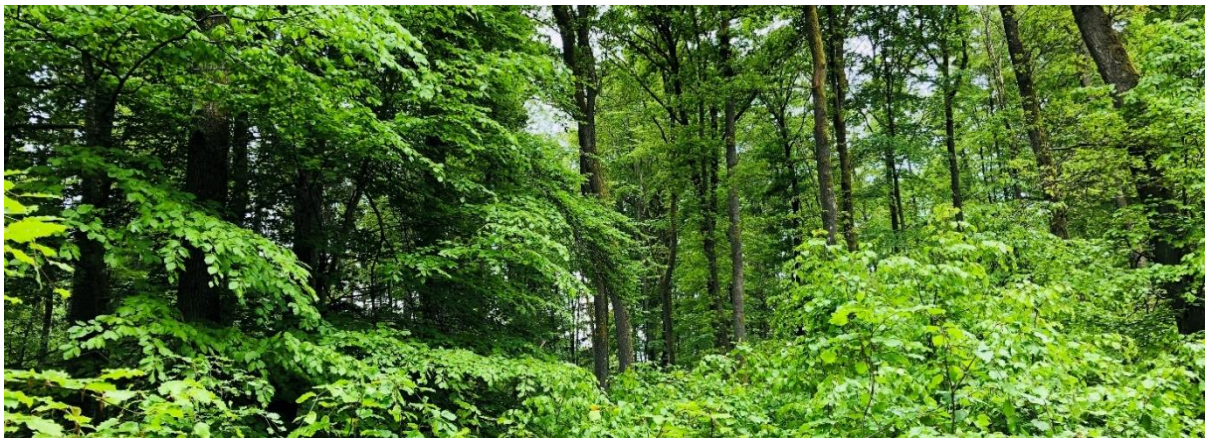
1.2.1 Concepts and definitions

Sustainable forest management is the pivotal concept in ensuring long-term and sustainable development of a forest-based bioeconomy. Independent and internationally recognised voluntary forest certification schemes verify the application of sustainable forest management principles. Over the last three decades, the concept of sustainable forest management has been gradually enforced, and legal frameworks supporting it have been widely adopted worldwide. This supports a balance between social, environmental, biodiversity and economic factors.

> "Sustainable forest management means the stewardship and use of forests and forest lands in a way, and at a rate, that maintain 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."
>
> *Forest Europe (1993), Second Ministerial Conference on the Protection of Forests in Europe, 16-17 June 1993*.

Forest Europe's definition relies on the use of pan-European sustainability criteria and indicators to assess, monitor and report on progress towards implementation of sustainable forest management practices. This definition also covers the biodiversity and ecosystem services dimensions. It has been **internationally agreed** as part of Forest Europe and **is endorsed at EU level**.[5]

The terms and definitions set out by the Food and Agriculture Organization of the United Nations (FAO) constitute the basis for the most recent update to the pan-European indicators for sustainable forest management.[6] Under the EU Forest Strategy for 2030, the European Commission is expected to propose further clarifications on forest terminology, particularly on concepts such as "primary and old-growth forests,"[7] "closer-to-nature forestry"[8] and "biodiversity-friendly" forest management practices.[9]



[5] European Commission (2018), Report from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Progress in the implementation of the EU Forest Strategy; General Secretariat of the Council (2019), Council conclusions on the progress on the implementation of the EU Forest Strategy and on a new strategic framework for forests; European Parliament resolution of 8 October 2020 on the European Forest Strategy — The way forward (2019/2157(INI)).

[6] Forest Europe (2015), *Relevant terms and definitions used for the updated pan-European indicators for sustainable forest management*. The terminology set out in this document is based on FAO (2015), *Global forest resources assessment 2015*.

[7] The Commission is working on a common definition for "primary and old-growth forests" and on what protection they should be given.

[8] Such as continuous cover forestry.

[9] In the EU Forest Strategy for 2030, the Commission proposes a number of measures for adaptive forest restoration and ecosystem-based management approaches to further strengthen the resilience of EU forests.

Through sustainable forest management, the forestry sector **mitigates climate change** by enhancing carbon sequestration in growing trees and soils, and by further increasing the sustainable supply of renewable raw materials. These materials can store carbon for long periods and replace fossil-based and other carbon-intensive alternatives. Sustainable forest management also contributes to **climate change adaptation** by enhancing the resilience of forest ecosystems to future climate risks and reducing the risk of further land degradation by fixing and stabilising soils and improving their water-retention capacity. Furthermore, sustainable forest management helps to provide a **wide range of valuable ecosystem services and biodiversity protection**, such as wildlife habitats, amenity values for recreational activity and numerous non-timber forest products. In addition, specially designed agroforestry systems are important contributors to food security.

The **European Union acknowledges the multifunctional role of forests** and the efforts of forest owners and managers to enhance biodiversity and provide ecosystem services for the benefit of society. It is also conscious of the need to further improve sustainable forest management to deliver on EU climate and biodiversity goals.

Multiple-use forests are managed to deliver on the increasing demand for forest products, ecosystem services and public goods. Some 28% are managed for multiple use globally.[10] Conservation of biodiversity represents the primary management objective in about 13% of the world's forests, while protection of soil and water resources is the main management goal in over 30%.

A coherent approach to the conservation, restoration and active management of forests is needed to realise the full financial, economic, social and environmental potential of their natural capital. All these dimensions are interlinked and interdependent. The forest landscape restoration approach aims to **rehabilitate landscapes and restore marginal and degraded lands** to create productive forest landscapes that are resilient and sustainable in the long term[11]. It seeks to ensure that multiple ecological and land-use functions are restored, protected and maintained for the long term. Increasing the area of protected, conserved and sustainably managed forests (through long-term forest management plans) and increasing the proportion of forest-based products and materials produced from sustainably managed forests are important targets of the UN Strategic Plan for Forests 2030.[12]

[10] FAO (2020), *Global forest resources assessment 2020*.
[11] Including natural forests, forest plantations and agroforestry systems.
[12] United Nations Department of Economic and Social Affairs (2019), *Global forest goals and targets of the UN Strategic Plan for Forests 2030*.

1.2.2 Forest certification

Forest certification and associated labelling is a way of informing consumers about the sustainability of the forests from which wood and other forest products are produced. **Forest certification provides an internationally accredited mechanism for promoting sustainable forest management** and ensuring that forest-based products are sourced from sustainably managed forests.

Forest certification is a **voluntary process** whereby an independent third-party organisation **assesses the quality of forest management and production** against a set of requirements predetermined by a public or private certification body.

There are two types of forest certification:

- **certification of forest management**, which assesses whether forests are being managed in line with a specified set of standards;
- **certification of the chain of custody**, which verifies that certified material is identified or kept separate from non-certified or non-controlled material through the production process and traceable from the forest to the final consumer.

To label a product as certified, both forest management certification and chain-of-custody certification are required.

FAO, Sustainable forest management toolbox

Most forest certification standards address a **wide range of economic, social, environmental and technical aspects** of forest management, including the well-being of workers and of people living in and around the certified forest area.

Internationally accredited forest certification schemes are credible benchmarks for ensuring the implementation of sustainable forest management practices. They also support progress towards meeting climate, environment and biodiversity objectives and targets. The Programme for the Endorsement of Forest Certification and the Forest Stewardship Council are examples of widely agreed and adopted forest certification schemes. Other voluntary certification schemes exist and are also recognised by the European Union.[13]

The European Commission is preparing guidelines on closer-to-nature forestry. These guidelines will lay the foundations for the closer-to-nature voluntary certification scheme.[14] This scheme will enable the most biodiversity-friendly management practices to benefit from an EU quality label.

The Policy on Conversion of the **Forest Stewardship Council** sets out that land areas converted from natural forests to round wood production after **November 1994** cannot qualify for Forest Stewardship Council certification.[15] Under this policy, investments that aim to produce, or make use of agricultural or forestry products associated with unsustainable expansion of agricultural or forestry activities into land that had the status of high carbon stock and high biodiversity areas[16] after the cut-off date cannot be considered sustainable. The EU Taxonomy Regulation uses **1 January 2008** as the cut-off date.[17]

[13] Such voluntary schemes are mainly used for recognising compliance with EU sustainability criteria for forestry feedstock (Directive (EU) 2018/2001).

[14] In the EU Forest Strategy for 2030, the Commission announced that it would develop a definition and adopt guidelines for closer-to-nature forestry practices, and a voluntary closer-to-nature forest management certification scheme.

[15] For areas converted after the 1994 cut-off date, substantial remedies are required as preconditions (exceptionality requirements) of Forest Stewardship Council forest management certification and membership (Principle 3 of its Policy on Conversion).

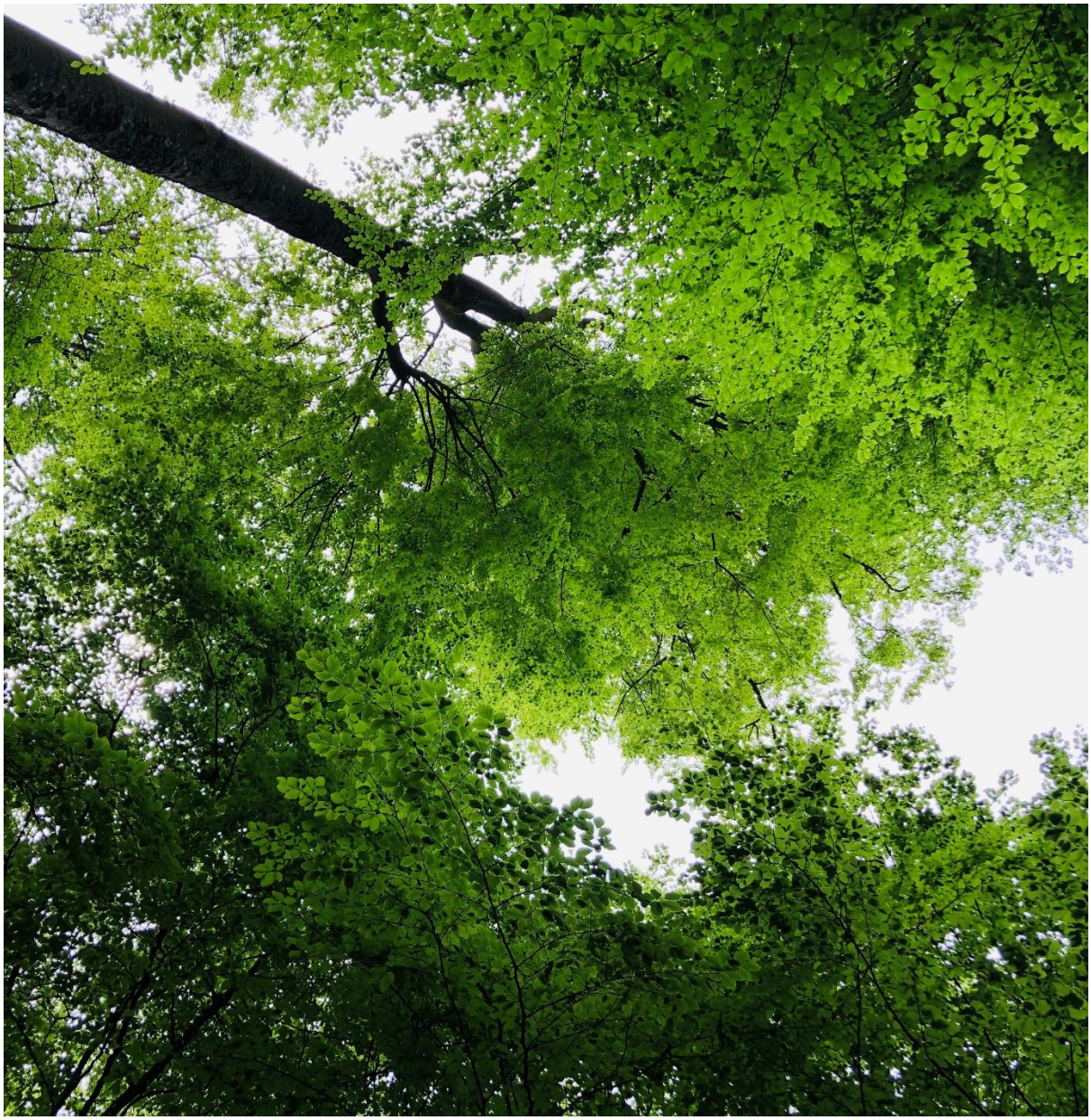
[16] For example, primary and secondary forests, peatlands, wetlands and natural grasslands.

[17] As set out in the sustainability criteria for biomass sourcing provided in Directive EU 2018/2001.

1.2.3 Environmental and social sustainability

Sustainable forestry operations do not cause negative economic, social and environmental impacts or risks. They ensure that the agreed prerequisites are implemented in practice. Prerequisites include ensuring alignment with sustainable forest management principles and international best practices (including forest certification), protecting biodiversity, promoting inclusion and human dignity, safeguarding health and well-being, and providing decent living standards.

Sustainable forestry operations should also respect International Labour Organization standards[18] on human rights and social rights. Such rights include gender equality, health and well-being and consultation of local communities. These aspects are covered by the principles set out in the FAO's guidelines on land, fisheries and forests.[19]



[18] See International Labour Organization, Labour standards.
[19] FAO (2012), *Voluntary guidelines on the responsible governance of tenure of land, fisheries and forests in the context of national food security*.

2 POLICY FRAMEWORK, MARKET OUTLOOK AND INVESTMENT BARRIERS

2.1 EU policy framework specific to the forestry sector

The forest policy framework of the European Union is governed by the subsidiarity principle and hence is within the jurisdictions of Member States.[20] Local conditions and site-specific characteristics are of paramount importance for site-adapted management in the forestry sector. At the same time, the European Union[21] regards **forest protection and aspects related to energy and climate policy as a fundamental part of EU environmental action** and of the European Union's jurisdiction.

Two main forest policies inform, guide and explain the main principles and objectives of the EU forestry sector, namely the EU Forest Strategy for 2030 (covering the EU-27) and the Forest Europe process (which also includes other European countries). The **EU Forest Strategy for 2030 builds on and** is strongly interlinked with the EU Biodiversity Strategy for 2030.

EU Forest Strategy for 2030 at a glance

The EU Forest Strategy for 2030[22] is a **flagship part of the European Green Deal** and of the EU Biodiversity Strategy for 2030. It plays a key role in achieving the European Union's 2030 biodiversity objectives and greenhouse gas emissions reduction targets. The strategy aims to **improve the quantity and quality of EU forests**, reversing negative trends and adapting forests to the new growth conditions — such as extreme weather events — brought about by climate change. The strategy includes a set of regulatory, financial and voluntary measures for 2021-2030, with the **multifunctional role of forests at its core**. The measures are:

- promoting **sustainable forest management**, including by encouraging the sustainable use of wood-based resources;
- providing **financial incentives** for forest owners and managers to adopt environmentally friendly practices, such as those linked to **carbon storage and sequestration**;
- increasing area of growing forests and improving biodiversity of forests, including by **planting 3 billion new trees by 2030**;
- promoting **alternative forest industries** such as ecotourism and those of non-wood products such as cork, honey and medicinal plants;
- encouraging the take-up of financial support under the **Common Agricultural Policy**, which can help forests and forest-based industries to mitigate climate change;
- providing **education and training** for people working in forest-based industries and making these industries more attractive to young people;
- establishing a **legally binding instrument for ecosystem restoration**, and a new legislative proposal on EU forest observation, reporting and data collection;
- protecting the European Union's remaining **primary and old-growth forests**.

Source: European Parliament (2022), New EU Forest Strategy for 2030.

[20] Articles 191 and 192 of the Treaty of the Functioning of the European Union.
[21] Including the European Commission, the European Parliament and the European Council.
[22] Adopted by the European Commission on 16 July 2021 and by the EU Parliament and EU Council in November 2021.

The EU Forest Strategy for 2030 covers the whole forest cycle and seeks to promote the **multiple ecological functions and socioeconomic services** of forests.[23] The strategy's support for a **sustainable forest-based bioeconomy**[24] focuses on production of wood-based materials and products that can substitute for fossil-based materials and products (for example concrete, steel, plastic) and that can store carbon for longer periods.[25] It also focuses on the uptake of sustainably harvested wood in the construction sector.

A key part of the EU Biodiversity Strategy for 2030 and the EU Forest Strategy for 2030 is the restoration of Europe's damaged ecosystems, with the aim of increasing biodiversity, enhancing climate change mitigation and adaptation, and preventing and reducing the adverse impacts of natural disasters. In 2022, the Commission put forward a proposal for a **Nature Restoration Law**.[26] This law would cover all Member States and all ecosystems — forests, agricultural land, marine ecosystems, freshwater ecosystems and urban ecosystems. The proposal **sets out multiple binding restoration targets and obligations** across ecosystems. The proposal intends to ensure that ecosystems across the European Union are on the path to recovery by 2030, for at least 20% of the EU's land and sea areas, and that they would be restored by 2050. The Commission is also reviewing the EU Regulation on Invasive Alien Species.

Forest Europe is the pan-European voluntary high-level policy process for intergovernmental dialogue and cooperation on forest policies in Europe. Its membership extends beyond the EU-27. Forest Europe develops common strategies for its 46 signatories[27] on how to protect and sustainably manage their forests. Achievements to date include setting out and promoting best practices through internationally agreed guidelines, criteria and indicators for sustainable forest management.

Forest Europe's sustainable forest management criteria

1. Enhancement of forest resources and their contribution to global carbon cycles
2. Maintenance of forest ecosystem health
3. Encouragement of productive functions of forests
4. Conservation of biological diversity in forest ecosystems
5. Enhancement of protective functions in forest management (notably soil and water)
6. Maintenance of other socio-economic functions

Source: Forest Europe | Sustainable Forest Management

[23] Including by promoting the enhancement of skills and training of forest stakeholders, employment and fostering rural development, and innovative forest-based services and products with low environmental impact (i.e. replacing carbon-intensive counterparts).

[24] Support for the forest-based bioeconomy set out under the EU Forest Strategy for 2030 seeks to ensure synergies with the European Union's climate and biodiversity ambitions in feedstock-sourcing areas (e.g. adaptive, ecosystem-based, resilience-enhancing and pro-biodiversity forest management).

[25] Long-lived circular materials and products, such as sawn wood, engineered wood products and wood-based panels.

[26] European Commission (2022), *Green Deal: Pioneering proposals to restore Europe's nature by 2050 and halve pesticide use by 2030*, defines legally binding targets for ecosystem restoration. It both builds on existing legislation and addresses ecosystems, habitats and species not covered by existing legislation.

[27] 45 European countries and the European Union.

2.2 Cross-sectoral EU policy framework with links to the forestry sector

The European Green Deal is the European Union's response to domestic and global climate and environment-related challenges. In addition to the target for carbon neutrality by 2050, other key features of the deal include **protect, conserve and enhance the EU's natural capital**, and protect the health and well-being of people from environment-related risks and impacts through a just and inclusive transition.

Source: European Commission.

The Green Deal includes an action plan to boost the efficient use of resources by **moving to a clean, circular economy, restoring biodiversity and cutting pollution**. A forest-based bioeconomy plays a major role in reaching the Green Deal's objectives.

> The European Green Deal is a growth strategy that aims to transform the European Union into a "fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use."

In addition to the Green Deal and the general policy framework of the EU Forest Strategy for 2030, a number of other EU-level directives, regulations and other policy tools cover forests and aspects of the forestry sector. Important developments relevant for forests and the forest-based sector include the Biodiversity Strategy for 2030, the EU Strategy on Adaptation to Climate Change, the Circular Economy Action Plan and the Taxonomy Regulation under the Sustainable Finance initiative. Further policies that shape Member States' national forest sector are the Common Agricultural Policy, EU industrial policy, the Roadmap to a Resource Efficient Europe, the plant health and reproductive materials strategy, the Bioeconomy Strategy, the Circular Economy Action Plan, and the EU Action Plan Towards Zero Pollution for Air, Water and Soil.

2.3 An EU forest policy framework with an international focus

In 2008, the Commission issued a communication addressing the global challenges of deforestation and forest degradation to tackle climate change and biodiversity loss. **Halting global forest cover loss by 2030** through improved EU policies to help conserve the world's forests was set as an EU objective. In 2019, the Commission adopted a complementary EU communication on stepping up **EU action to protect and restore the world's forests**. This action is intended to particularly focus on protecting primary forests and restoring degraded forests in a sustainable and responsible way. The overall aim is to enhance forest protection and to ensure growth of the world's forest cover, thereby improving people's health and livelihoods and ensuring a healthy planet for present and future generations.

The European Union published the **Forest Law Enforcement, Governance and Trade (FLEGT)** Action Plan in 2003. This plan aims to tackle illegal logging. It sets out seven measures to **prevent the importation of illegal timber** into the European Union, to **improve the supply of legal timber** and to **increase demand for timber from responsibly managed forests**. It interacts with public timber regulations, private legality verification and sustainability certification schemes. Together, these constitute a prominent global timber legality regime. The action plan has led to two key EU policies: the FLEGT Regulation and the EU Timber Regulation.

The **FLEGT Regulation**, adopted in 2005, allows for the control of imported timber in the European Union from countries entering into bilateral **FLEGT Voluntary Partnership Agreements** with the European Union. These agreements include commitments and actions from both parties to halt trade in illegal timber, notably through FLEGT licences certifying the legality of timber exported to the European Union, which are issued by the partner countries. Partner countries are bound to implement a timber legality assurance system and other measures specified in the agreements to be able to issue FLEGT licences.

The **EU Timber Regulation** was adopted in 2010 and came into effect in all EU countries in March 2013. It **prohibits the placing of illegally harvested timber on the European market**, and covers both **imported and domestically produced** timber and timber products. The regulation covers a broad range of timber products including solid wood products, flooring, plywood, pulp and paper, but it does not include recycled products or printed paper products such as books, magazines and newspapers. The regulation sets out ways of minimising the risk of illegal wood entering the EU market. Businesses must undergo a **due diligence process** to ensure that timber products placed on the EU market are legal.

Timber or timber products that carry a valid FLEGT licence or Convention on International Trade in Endangered Species of Wild Fauna and Flora permit comply with the EU Timber Regulation. While not endorsing any specific schemes for forest certification (e.g. the Forest Stewardship Council or the Programme for the Endorsement of Forest Certification), the European Union acknowledges that certification schemes play an important role in due diligence efforts.

2.4 Global agreements and conventions on forestry

The UN 2030 Agenda for Sustainable Development demands an integrated approach to natural resource use and management, including for forests. The European Union is committed to the **2030 Agenda** and achievement of the **Sustainable Development Goals (SDGs)**, which are an intrinsic part of the European Union's political agenda within and outside its borders and across all sectors.[28] Sustainable investments in the forestry sector can substantially contribute to a number of SDGs, particularly to **SDG 13 (climate action)** and **SDG 15 (life on land)**,[29] which sets out the need to "protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss." Other SDGs to which the forestry sector can contribute are SDG 1 (no poverty), SDG 3 (healthy lives and well-being), SDG 5 (gender equality), SDG 6 (clean water and sanitation), SDG 10 (reduced inequalities), SDG 11 (sustainable cities and communities) and SDG 12 (responsible consumption and production patterns).

International efforts to agree on a comprehensive and legally binding agreement on forests have not been successful to date. **Non-legally-binding forest-relevant instruments** include two key outputs from the 1992 Rio de Janeiro Earth Summit, namely the Forest Principles and Agenda 21 (Chapter 11 on combating deforestation). These instruments have, among other things, contributed to the establishment of the **United Nations Forum on Forests** as an international forum to discuss forest-relevant issues. In April 2017, the United Nations adopted the **Strategic Plan for Forests 2017-2030**, which provides a global framework for action at all levels to sustainably manage all types of forests and trees outside forests, and to halt deforestation and forest degradation. In support of better integration and policy coherence with forest-relevant SDGs, the United Nations Forum on Forests set out six **Global Forest Goals**[30] and 26 associated targets.

The European Union is also a signatory of the **Paris Agreement** and other international agreements. Other important international commitments and conventions that are relevant to the forestry sector include the United Nations Framework Convention on Climate Change, the Reduction of Emissions from Deforestation and Degradation framework, the United Nations Convention to Combat Desertification and FAO's Forest and Landscape Restoration Mechanism.

[28] European Commission, EU holistic approach to sustainable development
[29] SDG 15 recognises the synergistic interactions between forest, water and biodiversity, calling for integrative and collective action.
[30] United Nations Department of Economic and Social Affairs (2021), *The Global Forest Goals report 2021*.

2.5 Market outlook and investment needs

The forestry sector is rooted in **rural areas**. It generates significant revenues, employment opportunities and improved livelihoods in those areas, thereby contributing to **economic and social cohesion**. Forestry represents a large untapped potential for sustainable economic growth and social development. It will play a key role in supporting the goals of the European Union and the UN Agenda 2030 for Sustainable Development.[31]

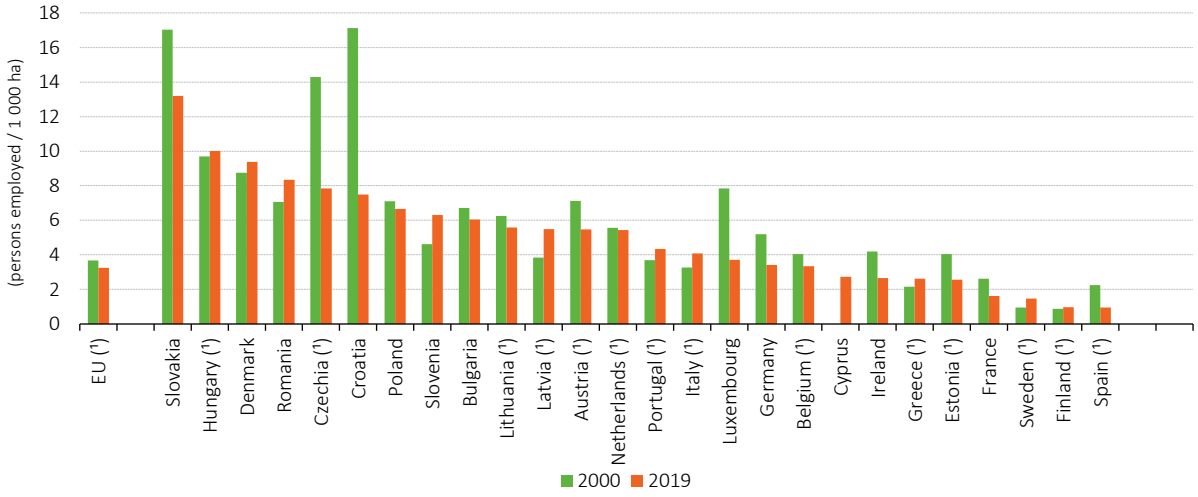
Sustainable forest management enables the primary forestry sector to ensure the much-needed supply of wood raw materials required for the production of renewable bio-based materials, biochemicals, biofuels and bioenergy. Forest-based industries play an important role in the development of competitive circular bioeconomies,[32] delivering on UN SDGs and supporting sustainable economic growth and job creation in rural economies.

The economic importance of an industry can be measured by the share of its gross value added in the economy and employment created. The **EU forest-based sector** (forestry and forest-based industries) generates a gross value added of about **€165 billion per year** and employs over **3.6 million people**. Employment in the forest-based sector has declined by about 30% over the last two decades, mainly due to efficiency gains linked to technological innovations and automation of production processes, but also due to migration from rural to urban areas.

Forestry sector

The total gross value added generated by the **forestry and logging sector**[33] in the European Union in 2019 was **€25.3 billion**. In absolute terms, the greatest gross value added was generated in Finland (€4.2 billion), Sweden (€3.5 billion) and France (€3.3 billion). On average, forests of EU countries generated €159/ha of gross value added in 2019.[34]

Employment per area of forest, 2000 and 2019



(1) Data on forest area for 2019 are estimates.

Note: Data on forest area for 2000 are estimates. Data for France refer to metropolitan France. Cyprus: 2000 data not available. Malta: not applicable.

Source: Eurostat (online data codes: nama_10_a64_e and for_area_efa)

[31] The forestry sector has the potential to contribute to various SDGs, in particular SDG 13 (climate action) and SDG 15 (life on land).

[32] Through production of renewable, recyclable and/or reusable biomaterials and bioproducts (e.g. paper packaging; tissues; hygiene products; engineered wood products and biomaterials for construction; wood-based panels), and production of biofuels and renewable energy.

[33] Statistical Classification of Economic Activities in the European Community (NACE) section A (agriculture, forestry and fishing), division 02 (forestry and logging). This division includes the production of roundwood and the extraction and gathering of wild-growing non-wood forest products.

[34] Eurostat (2021), Forests, forestry and logging.

About **517 000 people** were employed in the EU forestry and logging sector in 2019, a decrease of 7% from 2000. In relative terms, the average forestry employment rate per 1 000 ha in the European Union is less than four people (full-time equivalent), which is about 50% lower than the global figures reported by the United Nations Economic Commission for Europe (UNECE) and FAO.

In 2020, the total annual roundwood production in the European Union was 488 million m^3, which is about 21% more than in 2000. However, at 60% **of the total forest growth**, the annual **wood harvests in the European Union** were well below 2000 levels. About 40% of the annual growth has been saved. Production of roundwood is projected to increase across all UNECE subregions and globally. At the same time, it is expected that the European Union will continue to remain a net importer of roundwood, while other UNECE subregions are expected to remain net exporters of industrial roundwood.

Over the last two decades, the **forest area in the European Union increased by about 10%**, while the growing stock of EU forests increased by 30%. The forest growing stock in the UNECE region is projected to continue to rise steadily in the coming decades. However, outside the UNECE region, global growing stock continues to decline.

Forest-based industries

The European Union's forest-based industries[35] cover a range of activities, such as sawmilling, engineered wood products, wood-based panels; furniture building; pulp, paper and packaging board manufacturing; as well as industries using pulp to make a wide range of renewable materials and other goods.

In 2018, about **400 000 enterprises** were active in **forest-based industries across the European Union**. Such enterprises represented about 20% of manufacturing enterprises across the Union. With the exception of the pulp and paper subsector, which is characterised by economies of scale, many forest-based industries have a relatively large number of small and medium-sized enterprises (SMEs). The **total gross value added** generated by the EU forest-based industries in 2018 was **€139 billion** (7.1% of the total EU manufacturing industry). These industries employ about 3.1 million people (10.3% of the EU manufacturing sector).

The **forest-based sector** is undergoing significant **structural changes**. These are mainly triggered by global social and environmental challenges, including the need to safeguard natural capital and reduce environmental degradation while simultaneously providing goods and services for a growing global population. Technical developments open new options to substitute forest-based renewable materials and goods for fossil-based products.

In the last decade, there has been a big **shift from the linear economy** (production, consumption and disposal of products) to a **circular economy** through sustainable production and consumption that allows for more materials to be **recycled and reused**. Given that the construction sector accounts for more than one-third of the global resource consumption, and that forest-based industries are closely linked with the construction sector, this same shift has happened in the forestry industry.

The transition towards a **circular forest-based bioeconomy** is expected to reduce the pressure on the environment across the entire life cycle of products and to provide sustainable and renewable biomaterials. Dealing with adaptation to and mitigation of climate change, scarcity of natural resources and environmental degradation will require an increased reliance on nature-based solutions, renewable energy and materials that will have to be used in a highly efficient way in closed material cycles (circularity).

[35] As per the Statistical Classification of Economic Activities in the European Community (NACE), forest-based industries are part of section C (manufacturing), divisions 16 (manufacturing of wood and wood products), 17 (manufacturing of pulp, paper and paper products), 18 (printing and service activities related to printing) and 31 (manufacture of furniture).

In this context, forest-based industries play a significant role in developing a circular bioeconomy through the development of innovative and renewable **wood-based construction materials, bio-based packaging and biofuels**. It is expected that this will continue across the entire sector and that research, development and innovation will play a crucial role in developing further sustainable solutions and new products[36] for a **forest-based and circular bioeconomy**.

It is also expected that the **use of wood-based materials will gradually increase in the construction sector**, replacing more energy-intensive and fossil-based materials such as concrete or steel. Using wood products from sustainably managed forests will help reduce environmental impacts associated with conventional construction materials (i.e. embodied energy, water, waste), while also reducing greenhouse gas emissions through **carbon storage over the product's entire life cycle**.[37] The carbon storage can go even beyond the product's life cycle if, at the end of their economic life, the wood products are recycled and reused in the production of new goods and structures (circular economy).

The **global market outlook** for sustainable forest products is favourable, with demand strengthening annually by 2–3%. Growing trees and forest products have a pivotal role to play in the ongoing **global shift** from **fossil-based materials to renewable and recyclable materials**. In addition to this necessary shift, the demand growth is the result of global increases in households' disposable income, ageing populations in rich countries (e.g. the European Union, Japan and the United States) and improving living standards particularly in China and emerging markets in the African, Caribbean and Pacific region and the Asia and Latin America region.

Sawn wood production is expected to rise most in the European Union. The European Union is projected to be an increasingly important global source of sawn wood in 2020-2040. North America, on the other hand, is projected to produce a steadily smaller share of total UNECE and world output over time.

Projections indicate rising total output of **wood-based panels** across all UNECE sub-regions except North America, which is projected to have relatively stagnant total production.

Projections for the **pulp and paper sector** show two developments in the UNECE region toward 2040. The newsprint, printing and writing paper segments continue to see declining production and consumption as digitalization and other technology develops. The market pulp, specialty paper and paperboard segments continue to grow steadily in line with e-commerce and economic growth.

Source: UNECE and FAO (2021), Forest sector outlook study 2020-2040.

[36] For example, second-generation biofuels, bioplastics, innovative wood-based materials, pharmaceuticals and packaging solutions.
[37] FAO and UNECE (2016), *Promoting sustainable building materials and the implications on the use of wood in buildings*.

The **design, development and production of engineered wood products and high-value long-lived wood materials and products**[38] are expected to outpace those of simple sawn timber (lumber). This is due to the superior mechanical characteristics and versatility of such materials and products,[39] and to their capacity for long-term carbon storage.

Reconstituted board products (wood-based panels) are also expected to be increasingly important. They comprise smaller wood-based strands and fibres reformed into panel products. These have structural applications but are also used extensively in the furniture-making and packaging industries. Similar to the sawmilling industry, the wood-based panel segment will focus on development of higher value-added products[40] with top-layer finishing (laminated boards) in place of raw chipboards.[41] This is because such products have superior characteristics and durability and longer-term carbon storage potential.

The **demand for forest products** varies between market segments. The pulp and paper market in particular is going through twofold structural changes that are expected to continue. The demand for pulp (renewable fibre) strengthens by about 3% per year, but demand for certain paper, particularly newsprint, is weakening rapidly as people read more news online or on mobile devices. Global online commerce, on the other hand, strengthens the demand for renewable and recyclable packaging. The tissue and hygiene product market is growing as a result of increasing incomes in emerging economies and ageing populations in rich countries.

Consumer preferences and awareness are changing not only with regard to the environmental and social sustainability of consumer goods, but also with regard to the value of standing forests as providers of recreational and ecosystem services. Ecosystem services can be pivotal in enhancing biodiversity and maintaining life. At the same time, they trigger a much-needed increase in income for foresters and forest owners.

The **global forest-based sector is expected to become more complex**[42] as it is affected by an increasing number of cross-sectoral interlinkages such as those between the effects of climate change; energy policies and advances in new technologies; potential trade-offs between environmental services and commercial utilisation of wood raw materials; the increasing role of environmental services; and societal and political interests in a low-carbon bioeconomy.

Large-volume **forest products** (timber, woodchips, wood pellets, pulp, packaging boards and paper) are **globally traded commodities**, with **liquid and efficient international markets**. The international spot markets for pellets and pulp are supported by openly traded and quoted hedging instruments, such as futures and options contracts.

[38] Such as glue-laminated timber, cross-laminated timber, laminated veneer lumber, laminated strand lumber, parallel-strand lumber and finger-jointed softwoods.
[39] In other words, maximum sizes are limited only by manufacturing, handling and transport constraints.
[40] Such as medium-density fibreboards and high-density fibreboards.
[41] Such as oriented strand boards.
[42] European Forest Institute (2014), *Future of the European forest-based sector: Structural changes towards bioeconomy*.

Investment needs

As governments face intensifying funding shortages and as development cooperation has limited growth margins, long-term financing solutions may increasingly rely on the private sector and on instruments enabling self-sustained financing such as environmental funds. **Private sector investors are key to long-term primary forestry sector finance**, whether as social investors in the framework of corporate social responsibility or as impact investors looking for a mix of social and financial returns.

According to the Global Partnership on Forest and Landscape Restoration, more than **2 billion ha of the world's deforested and degraded landscapes** have potential for forest landscape restoration. Continued landscape degradation poses serious obstacles to eliminating poverty and hunger, and maintaining biodiversity. It also makes it difficult for farmers and local communities to adapt to climate change that increases competition for scarce natural resources. This threatens livelihoods, well-being, food, water and energy security, our living environment and natural ecosystems.

2.6 Investment barriers and challenges

The main investment barriers and challenges for the primary forestry sector and forest-based industries are summarised in the table below.

Type of investment barrier or challenge	**Investment barriers and challenges**	
	Forestry sector (natural resources)	**Forest-based industries (value chain)**
Market size and structure	→ Fragmented ownership → Lack of liquid trading markets → Missing/underdeveloped markets for ecosystem services	→ Fragmented forest ownership → Wood trade: unpredictable import/export restrictions, tariffs and taxes of large producers (e.g. Russia) and demand from large importers (e.g. China) → Fragmented markets, with SMEs facing high costs/competitiveness issues (except for pulp and paper and some wood-based panel and sawn wood subsectors) → Competitiveness hindered by energy and transaction costs
Lack of capacity	→ Identification and structuring of bankable projects → Inconsistent definitions of sustainability → Lack of standard valuation methods (including cost–benefit analysis and valuation of ecosystem services)	→ Insufficient information on forest resources (species, qualities, dimensions) and demand and supply for decision-making → Shrinking qualified workforce → Insufficient digitalisation
Access to finance	→ Scarce public funding → Low revenues and high exposure to climatic events, reducing private funding	→ High finance costs for SMEs, both for raising capital investment and for operational liquidity

Investment barriers in the forestry sector (natural resources)

The **major economic challenges and obstacles** to achieving public policy objectives include the scarcity of funding for afforestation, reforestation and climate change adaptation activities; competing land uses; and lack of, or underdeveloped markets for, ecosystem services. The relatively low net revenue of forest enterprises may negatively affect implementation of sustainable forest management. This would be the case especially in the context of volatile wood markets, adverse effects of changing climate and requirements for more demanding forest management systems (i.e. close to nature) as a response to climate change adaptation and emerging stricter environmental and social standards including certification or audits. Revenue generation from managed forests in Europe is mainly driven by timber production (over 80% of the total income), while some 15% comes from non-timber forest products and 2-3% comes from ecosystem services.

Private investors face a number of challenges related to business and policy environments in some targeted areas, knowledge gaps and capacity to assess benefits and mitigate risks, leading to suboptimal investment situations.

The main barriers to private investment in forest landscape restoration in developing countries are associated with **poor business environment**, **fragmentation of ownership** and **weak governance frameworks**. Such barriers include high real and perceived risks related to political context, insecure land tenure, currency, social and environmental factors, and reputation. These are usually coupled with lack of domestic funding, generally unfavourable terms for financing and high upfront costs of investment projects in the forestry sector.[43]

Fragmented ownership and the small size of forest properties are major barriers to sustainable forest management and related investments. While state owned forests are generally managed according to political, societal and business objectives, there is wide variation in management in private forests, especially in small-scale forest ownership. Fragmentation often leads to **economic inefficiency in forest management** (higher harvesting and transaction costs), disincentives for investment in sustainable forest practices, and greater management problems related to the provision of ecosystem services, including wildlife, water, recreational opportunities and soil protection.[44]

Other key global investment barriers are:

i. the **prevailing knowledge gap** for **identification and structuring of bankable projects**, notably commercially viable models for forest landscape restoration, including poor understanding of how to generate financial returns to investment and of how to scale up activity through feasible investments supported by public funding;
ii. **scientific knowledge gaps around landscape restoration**, including the restoration value of different species, especially locally adapted ones;
iii. **lack of clarity** surrounding the **large-scale and multifunctional benefits of forests**, along with a lack of standardised metrics and methods to value and to pay for ecosystem services provided by forests;
iv. **inconsistent definitions of sustainability** and the absence of best practice guidelines from governments and regulatory bodies, which create uncertainty and risk for investors, dissuading them from engaging in forest projects.

All of this means that valuation of and investment in forest assets — and the due diligence of forest companies and projects — is a complex, lengthy and expensive process, deterring non-specialised private investors from entering the sector.[45]

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[43] Program on Forests (2014), *Private financing for sustainable forest management and forest products in developing countries: Trends and drivers*.

[44] European Forest Institute.

[45] Global Landscapes Forum (2016), *Removing barriers for investing in forest landscape restoration*.

Other constraints associated with the overall realisation of returns on investment are linked to **limited exit possibilities** and **underdeveloped markets for the monetisation of ecosystem services** and non-timber forest products. These constraints include the following.

i. **Long production/rotation cycles**: in general, new forests do not generate significant positive cash flows from timber sales before investors wish to exit. So, at the preferred exit time, the original investor may not yet have records of solid cash revenues, but only a standing asset with uncertain revenue prospects.

ii. **Lack of liquid trading markets**: outside the European Union and especially in high-risk countries, there are insufficient investors in the market to absorb assets for sale without affecting the price of the asset. Furthermore, there are only a few transactions a year and a small number of experienced investors. Consequently, there is no transparent trading market for forest assets that could permit price standardisation.

iii. Missing markets and **limited trading possibilities for valuable public goods and externalities generated by forests**: examples are carbon, water, biodiversity externalities and green landscapes as public goods.

Investment barriers for EU forest-based industries

The European Union's forest-based industries face a number of challenges related to global competition, raw material supplies, sustainability requirements, increased environmental, renewable energy and climate policy ambitions and targets, educational needs, logistics and an ageing workforce. These barriers are described in the blueprint for the EU forest-based industries[46] and in the report on the study on access-to-finance conditions for investments in bio-based industries and the blue economy.[47] In addition, key challenges affecting the sector's competitiveness set forth by the blueprint are common to the furniture industry, the woodworking industry,[48] the pulp and paper industry and the printing industry. These challenges revolve around the following topics.[49]

I. Sourcing of raw materials

EU domestically harvested industrial wood accounts for about 90% of the wood processed by EU forest-based industries, equivalent to about 45% of annual EU forest growth in forests available for commercial purposes. Although EU forests have the potential to supply sustainable wood raw materials to keep up with increasing demand, internal wood supplies are affected by:

i. insufficient information on forest resources (species, qualities, dimensions) available for informed decision-making in the value chains;
ii. diminishing quality, dimensions and accessibility of uncut wood;
iii. fragmented forest ownership and distant forest owners with no capacity or motivation to manage their forests and to produce wood;
iv. complicated environmental regulations and biomass sustainability criteria that are not required for other types of raw materials, putting the sector at a competitive disadvantage.

Open and efficient trade for wood is also affected by unpredictable export restrictions, tariffs and taxes. These market interventions increase transaction costs and imply excess market volatility, which reduces investments in the forestry sector to below their welfare-maximising equilibrium.

[46] Released in 2013 alongside the EU Forest Strategy for 2020.
[47] Prepared in 2017 by the InnovFin Advisory and European Investment Bank Advisory Services for the European Commission (Directorate-General for Research and Innovation).
[48] Subsectors of the woodworking industry: sawmilling, wood-based panels, carpentry/joinery, flooring and other wooden products.
[49] Adapted from the strategy for forest based-industries and its blueprint.

II. Competition from producers with better advantages and lower costs

Besides better resource endowments and lower labour costs, some global competitors availing of similar technology levels often benefit from production and/or export subsidies and seldom match the EU forest-based industries' social and environmental standards and protection of intellectual property rights. This creates a significant disadvantage for EU products, which often also face tariffs in other markets. In this context, trade agreements and relevant instruments to compensate for higher EU standards are essential tools for addressing these challenges, to provide a more level global playing field.

III. Resource and energy efficiency and the competing uses of timber

In the bioeconomy, resource efficiency and energy efficiency also affect the competitiveness of EU forest-based industries. Although resource efficiency within the industries is at a more than acceptable level, improvements in forest inventory information on the supply of wood and market information on demand for wood, wood-based materials and products are needed to increase market transparency and hence operational efficiency. With respect to energy efficiency, the European Union's forest-based industries generate much of their own process energy from residues of wood processed in their own facilities. However, energy bought into the sector in the European Union costs up to two and a half times that in the United States, which subsidises energy costs. Given that there is little prospect in the European Union of significantly decreasing energy prices, savings in energy costs can be made by European forest-based industries only through wider investments in process and energy efficiency, and in generating renewable energy from by-products and residues.

IV. Improved logistics

Better logistics are needed for raw material supply and product delivery. Efficient wood harvesting requires sophisticated equipment and skilled operators, the costs of which are compounded by many forests being fragmented and having poor access to such equipment and operators. Outside the forest, infrastructure and transport systems pose constraints, such as restrictions in, and variability between, Member States on lorry dimensions and weight limits, and non-integrated transport systems. Some of these limitations can be overcome through investments in **forest infrastructure**,[50] environmentally friendly **timber-harvesting systems**,[51] capacity building[52] and **improved communications** (mobile phone networks, broadband internet access, etc.) and increased cooperation between small and micro wood-harvesting firms to support logistics and health and safety in rural, especially remote, areas.

V. Structural adaptation

Structural adaptation is required for the industries to be able to remain competitive locally and globally. With the exception of the pulp and paper manufacturing industry and parts of the wood-based panel and sawn wood subsectors, forest-based industries are highly fragmented, with many SMEs and microenterprises. Forest-based industries suffer from relatively high unit costs as they cannot benefit from the economies of scale enjoyed by their larger rivals or the substantial subsidies provided to some overseas competitors by their governments. Forest-based industries also face high costs for finance, both for raising capital investment and for operational liquidity.

[50] Well-designed forest infrastructure (e.g. roads, tracks, drains, bridges, loading bays), firebreaks, etc.

[51] State-of-the-art harvesting technology adapted for local terrain (cable-yarding systems, harvesters, forwarders, etc.) with the lowest possible environmental footprint (e.g. soil erosion, soil compaction, damage to remaining trees) and risk of accidents.

[52] Examples include vocational training and skills enhancement, including for health and safety.

VI. Needs for education, training and skills

The needs for education, training and skills, including to maintain high labour productivity and to enhance social and labour standards,[53] span all the subsectors of the forest-based industries. However, the lack of these is most likely in small firms and microfirms in wood harvesting, woodworking, furniture-making and printing. Ageing workforces persist across all the forest-based industries, often partly because of a negative sectoral image and modest pay deterring young entrants, who may be more attracted to other, more tempting careers. Furthermore, the ageing of forest owners and, often, their location in urban areas raise the need for access to relevant education, training and skills development. In addition, the deployment of new and advanced technologies in the forest-based sector is likely to lead to the generation of new knowledge-intensive and high-tech jobs, which could appeal to the younger generation and help to rejuvenate the sector workforce.

The functioning of the key forest product markets is **sensitive to transaction costs and trade barriers**, such as export/import taxes and tariffs. Therefore, if the key forest products are drawn to geopolitical debate and race as a means to impose new trade barriers and tariffs, this will expose the whole forestry sector to a significant market risk. The new trade barriers would weaken the export demand in surplus areas and, in turn, weaken the supply from imports in the deficiency areas.

[53] Forest workers (including machine and tool operators, contractors and subcontractors) should be provided with the adequate salaries and social fringe benefits , including health and safety standards, appropriate to the typically harsh and dangerous work and terrain conditions in forests.

2.7 Market failures

In principle, open competitive markets allocate scarce resources efficiently to maximise social welfare. However, there are situations in which the market fails to reach this welfare-enhancing competitive equilibrium. A typical market failure concerns externalities, or spill-over effects, that may incur significant costs or benefits to third parties but are not taken into account in decision-making by private groups or individuals. As a result, private agents invest too much in activities with negative externalities, too little in activities with positive externalities and too little in the abatement of pre-existing negative externalities.

The market also fails in supplying public goods that are non-rival and non-excludable. The problem with public goods is that no one is willing to pay for them, as their benefits can be enjoyed for free. Consequently, private markets will fail to supply public goods, and governments generally need to provide them.

Sometimes the market for a particular product is poor or may not exist at all. This could be the case for new products or for products that require too much information to figure out their true value. Informational inefficiency occurs often, particularly with regard to small companies that do not have access to credit because they cannot prove their performance potential to lenders.

It is evident that forestry and the broader forest sector are confronted with several significant market failures that bound investments to the level that remains below the welfare-maximising, competitive equilibrium. Therefore, public intervention promoting sustainable investments in the sector has the potential for creating substantial social benefits and additionality.

In the primary forestry sector, market failures typically occur with respect to public goods and externalities, which lead to the undervaluation of forest products and services.

In forest-based industries, market failures include the following.

- Lack of provision of public goods through enabling/supporting the development of knowledge and innovation for the industry, through the implementation of state-of-the-art technology, leading to EU digital transformation and setting new industry standards.
- Failure to reduce the negative externalities of producing fossil-based and energy-intensive construction materials and products (i.e. concrete, steel) and associated greenhouse gas emissions by enabling the development and/or deployment of long-lived renewable and circular wood-based materials and products. The renewable and circular materials and products not only substitute for fossil-based alternatives, but also represent a channel for long-term sequestration of the CO_2 stored in the harvested wood products and biomaterials.
- Lack of support for new and/or enhanced renewable energy generation capacities and/or energy efficiency measures that mitigate negative externalities affecting the environmental and public health, including through new/upgraded more efficient wastewater treatment processes.
- The existence of incomplete markets, causing a suboptimal investment situation in the packaging industry by enabling sustainable, recyclable and renewable packaging production to become competitive in relation to the mainstream fossil-based (i.e. plastic) packaging solutions.

Forest subsectors characterised by the presence of many SMEs also suffer from asymmetric information problems. SMEs often lack credible evidence and records of their financial performance and capacity to invest in sustainable growth that would be required to get fair access to credit.

2.8 Investment gaps and justification for public financing

To meet global goals on climate change, biodiversity and land degradation, the world needs to close a $4.1 trillion financing gap in nature by 2050. Currently, about $133 billion flows into nature and forest-based solutions annually, with public funds representing 86% and private finance representing only 14%. By 2050, annual investments of about $536 billion will be needed in forestry, agroforestry and nature restoration projects.[54]

Investments of between **$36 billion and $49 billion per year** are required **to achieve agreed forest landscape restoration targets**, accounting for almost 10% of the required total climate finance of $350 billion to $640 billion annually. For example, the Global Forest Finance Pledge[55] is committing $12 billion of public funding (including EU) and $7.2 billion of private funding for forest-related climate finance between 2021 and 2025 for financing the protection, restoration and sustainable management of forests.

The Global Partnership on Forest and Landscape Restoration estimates that over 2 billion ha of the world's deforested and degraded landscapes have the potential for forest landscape restoration. The international community has set ambitious goals for forest landscape restoration, including reaching land degradation neutrality by 2030 (SDG 15.3), restoring 150 million ha by 2020 in the framework of the Bonn Challenge and restoring 350 million ha by 2030 under the New York Declaration on Forests. The European Union set an ambitious objective to plant an additional 3 billion trees by 2030 to further expand EU forest areas and to enhance the biodiversity of forests and their ecosystem services.

Although the exact amount of global investment in forest restoration and reforestation is unknown, existing commitments clearly fall far short of the requirements to reach these goals. Halting deforestation and forest degradation combined with sustainable restoration, reforestation and afforestation activities complemented by sustainable forest management provide opportunities for economic development, enabling sustainable production and consumption of agricultural and forest-based products.

Potential solutions for addressing investment gaps

To promote investments in forestry, the public sector can take steps to make the investment environment better, by improving governance, transparency and infrastructure. Other ways for the public sector to facilitate long-term investments in sustainable wood production include strengthening the information base on forest resources and finance,[56] supporting research and development in increasing productivity and developing appropriate infrastructure, mechanisms and schemes for compensation of biodiversity offsets and valuation of ecosystem services.[57]

[54] United Nations Environment Programme, State of finance for nature.
[55] Announced at the 26th UN Climate Change Conference (COP26) in 2021 and supported by the European Union.
[56] In other words, collecting and improving access to information on the availability of suitable land for investments, growth and yield, and on growing conditions in general, and risks; and recording and publishing information on domestic investments.
[57] Such as payments for ecosystem services schemes.

Blended finance through **public funds and multilateral development banks** could be vital in overcoming barriers and closing the investment gap. Multilateral development banks can do the following:

i. Catalyse investments in the forestry sector by reducing investment risks. This is achieved through **guarantees,** by supporting **public–private partnerships**, and by attracting other sources of finance (public and private) through the stamp of approval of a public bank, which guarantees compliance with high environmental and social standards.

ii. Improve access to finance and profitability by:

   a. developing **new financial instruments** favouring long-term investments (matching the economic life of the forest projects;
   b. developing **innovative financing vehicles and schemes** improving market liquidity (funds);
   c. rewarding **the delivery of public goods** (e.g. payments for ecosystem services schemes).

iii. Address knowledge gaps and reduce due diligence costs by **providing advisory services** for:

   a. project identification and preparation;
   b. helping to standardise and improve **methodologies for valuation of ecosystem services** and **cost–benefit analyses**.

To compensate for globally high industry production costs, the EU forest-based industries should further integrate and adopt the ”cascading” principle, which should allow the European Union to use its wood supplies more efficiently in the face of growing demand from the bioeconomy and for bioenergy. Furthermore, promoting circularity by improving wood recovery rates, reuse and recycling would increase the availability of valuable raw materials. This is already the case in the recovery of secondary raw materials for the pulp and paper industry. Recycling rates for these industries reach around 70% on average for the European Union, close to the economic optimum.

Strategies for overcoming the high degree of fragmentation in the forest-based industries, which are characterised by a large number of small companies, include (i) enhancing coordination across the value chains to achieve greater efficiency, through cooperatives, networking and development of clusters, (ii) giving more training to employees in industries undergoing severe structural adaptation and (iii) providing access to finance at competitive rates.

3 ADDITIONALITY AND IMPACT OF PUBLIC BANKS

Forests are **multifunctional ecosystems** essential to initiatives in landscape restoration, climate action and biodiversity protection. They provide a variety of ecosystem services to society, including water flow regulation and flood control; protection against soil erosion; carbon sequestration and storage; and resilience to the effects of climate change. A forest-based bioeconomy plays a vital role in contributing to the objectives of the **European Green Deal** and to the **UN 2030 Agenda for Sustainable Development**.

Sustainable forest management plays a key role in the current policy landscape, given that the sustainability principles cover the whole forest management cycle. It provides the means for maintaining and enhancing environmental benefits, restoring biodiversity, improving ecosystem services and supporting the sustainable production of renewable biomaterials for the circular bioeconomy and for substituting fossil-based materials with renewables.

Some **value-added characteristics** of forestry sector operations that justify the intervention of a public bank are presented below.

- Sustainable forestry operations include specific actions for **maintaining and enhancing environmental benefits**, **biodiversity and ecosystem services**. Such operations contribute to the removal of greenhouse gas emissions (through carbon sequestration and storage in trees and soils), to improved ecosystem resilience against climate change and to the conservation of biodiversity.
- Sustainable forestry tackles the root causes of deforestation and land degradation, demonstrating the socioeconomic and environmental benefits of active and sustainable management of forests.
- Growing, healthy and sustainably managed forests provide a **valuable renewable resource base** for commercial activity in the forest-based bioeconomy, which enables **long-term carbon storage in sustainable wood-based materials and products**. This means that sustainable renewable fibres, materials, goods and energy substitute for their non-renewable fossil-based counterparts. About half of forests' total climate change mitigation impact is realised through this commercial **substitution effect**.
- A forest-based bioeconomy plays a pivotal role in the **ongoing global shift** from fossil-based materials **to renewable and recyclable materials**. In addition to this necessary shift, demand growth is derived from global increases in households' disposable income, population ageing in rich countries (e.g. the European Union, Japan and the United States), and improving living standards particularly in China and emerging markets in the African, Caribbean and Pacific region and the Asia and Latin America region.
- **Recycling and reuse** are an essential part of forest products' commercial life cycle and, at the end of that cycle, following a **cascading principle of using the wood**, the material can be used to generate **renewable energy**. Along the recycling rounds, the fibre wears out technically and, therefore, virgin fibre is needed to maintain the quality of the recycled fibre. Certain packaging applications also require virgin fibre for hygiene and/or strength reasons, particularly for food, beverages and medicines.
- Modern forest industries are highly capital and information intensive, and have a **large potential for breakthrough innovations** in new products and solutions to support the green transition. **Research, development and innovation activities** target completely new applications and consumer goods such as textile fibres, recyclable packaging, construction (engineered wood products) and battery solutions that substitute for their fossil-based alternatives.

- Forestry sector activities generate employment opportunities in the upstream and downstream value chains — service providers, wood supply and logistics — with significant spillover effects for local rural economies. Consequently, they help address spatial inequalities and promote **territorial integration** through **rural development** (enhanced economic and social development of rural areas).

In this context, public banks' interventions should **focus on addressing and mitigating market failures**[58] and **overcoming suboptimal investment situations**, with the aim of ensuring that climate-resilient and biodiverse forests continue to thrive. This will strengthen the supply of sustainable roundwood and renewable fibres to downstream processing industries.

Primary sector interventions should focus on long-term investments for restoration and rehabilitation of degraded lands to combat coastal erosion and enhance the biodiversity, health and resilience of forest ecosystems. **Value-chain investments** should focus on sustainable production and reuse of renewable materials and bioenergy, and the related research and innovation.

There are many **opportunities for public banks to help economies when** commercial banks are unwilling to offer loans to certain parts of society. Such unwillingness on the part of private financiers often reflects investment risk, whereby multilateral development banks can offer financing under reasonable conditions that can lower the risk. Multilateral development banks can help a project happen much faster than it would otherwise, or they can improve its design and impact.

The terms, conditions and structure of finance provided by multilateral development banks can be quite different from products available commercially. Demonstrating better financing structures can also help market development. Multilateral development bank terms may include innovative features that are new to a specific market.[59] As the investment needs of the forest-based sector vary widely depending on the project size and the position in the value chain, public banks and multilateral development banks typically offer tailored financing products.[60]

Public banks also can offer funding to private sector projects, contributing to better outcomes that would not have been possible from commercial financiers alone. Such public bank offerings can include strong safeguards, help with knowledge building among clients, more potential for market creation.

Sustainably managed forestry operations have valuable carbon and environmental benefits. Such operations sequester and store carbon, while improving the soil's water-retention capacity to mitigate harmful soil erosion and floods. Forests create rich ecosystems and environments that enhance wildlife and biodiversity. Being geographically spread, **the forest cluster supports rural employment, economies and livelihoods and, hence, promotes economic and social cohesion**.

In upstream forest management, the related harvesting and logistic services, and in the small-scale first-stage mechanical forest industries, in particular, **financing by public banks and multilateral development banks can mitigate the adverse impacts of incomplete markets and asymmetric information**, which hinder SME and mid-cap access to credit. Research, development and innovation-oriented forest operations also help develop new renewable fibre and materials that can replace fossil-based products. In terms of public goods, healthy forests create green landscapes and improve air quality, which contribute to public health.

[58] A wide range of market failures prevent the achievement of optimal social and environmental outcomes.

[59] Financial additionality generally comes from the longer-tenor loans of public banks and multilateral development banks. Such loans may match the economic life of the project or even exceed the loan tenor available on the domestic financial markets. Public financing is typically key to the financial closing of the projects and the de-risking of operations. Therefore, it often has a signalling effect on the market, helping to unlock additional financing from private investors.

[60] For example, large-scale capital investments (direct investment loans), intermediated lending for SMEs through commercial and/or national promotional banks, risk-sharing finance, lending and blending alongside (investment) grants, guarantee schemes for small farmers, equity investments and financial instruments.

Benefits of working with a public bank

Public **lending should have a strong focus** on investments supporting **protection, conservation, rehabilitation or restoration of degraded forests**, landscapes and other ecosystems by **promoting sustainable forest management practices** and integrated landscape management approaches. Sustainable forest management and landscape restoration programmes are expected to gain momentum. This will create jobs in rural economies, enhance livelihoods through timber and non-timber forest products, and improve market access and long-term resilience and productivity of local ecosystems, landscapes and natural resources.

Reforestation/afforestation, conservation and restoration of ecosystems and biodiversity, including reclamation, rehabilitation and restoration of degraded (forest)land and enhancement of forest functions and ecosystem services, should be at the core of public financing for the forestry sector. Public intervention should support further expansion of forested areas and improved forest management practices that enhance the biodiversity of forests and their multiple ecosystem services and increase the supply of sustainable renewable fibres and materials for the (circular) bioeconomy.

There is a strong potential and need for public investments in further enhancing the economic sustainability of sustainable forest management by **developing effective mechanisms for valuation and monetisation of ecosystem services**. Internalising the positive environmental and social externalities of sustainable forest management in forest management and business plans would generate additional non-timber-related revenues directly linked to forests' multiple functions, thereby feeding back and supporting the protection, conservation and restoration of biodiversity and ecosystems. State and private forest organisations need to diversify their business strategies and further explore new business segments in the wider forest-based bioeconomy, including natural resource management (e.g. watersheds and landscapes) and provision of ecosystem services.

Investment opportunities for the forestry sector and hence for public financing are also expected to arise from the promotion of **nature-based solutions**[61] for climate resilience. Funding for nature-based solutions could be leveraged through innovative financing approaches and products under InvestEU, targeted support under cohesion policy programmes, and support for investments, eco-schemes[62] and advisory services under the Common Agricultural Policy, which includes significant contributions from EU Member States.

Through the launch and adoption of the concept of carbon farming, the Commission will promote a new business model for land-based carbon removals. This will include financial incentives to roll out nature-based solutions. Under the EU Forest Strategy for 2030, the Commission acknowledges that forest owners and managers need financial incentives to be able to provide, in addition to wood and non-wood materials and products, ecosystem services through forest protection and restoration and to increase the resilience of their forests through the adoption of the most climate- and biodiversity-friendly forest management practices.

The EU Forest Strategy for 2030 aims to foster public and private payment schemes for ecosystem services and to seek opportunities to incorporate the objectives and outcomes of such schemes under EU funding programmes. The strategy also encourages EU Member States to set up payments for ecosystem services schemes for forest owners and managers to cover for costs and possible income forgone from timber production as a result of the stricter climate and biodiversity requirements of the European Union.

Public financing should also focus on projects that develop, deploy and enable **market-based solutions for climate change, the environment and biodiversity**, including **nature-based solutions** and **natural capital asset management**, that promote sustainable management and conservation of natural resources.

[61] The European Commission defines nature-based solutions as "solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits, and help build resilience."

[62] Eco-schemes are payment schemes in agriculture aiming at the protection of environment and climate As a future CAP innovation, eco-schemes shall provide support for farmers who observe agricultural practices beneficial for the environment and climate (Eurostat)

Financing from public banks and multilateral development banks adds value to the sector. It supports **investments that contribute to EU and international commitments to halt global forest loss by 2030**. It also supports **the achievement of the land degradation neutrality targets of the United Nations Convention to Combat Desertification**[63] and the goal of the Bonn Challenge[64] through forest landscape restoration and implementation of sustainable forest management practices in existing and new forest lands.

Inside Europe, public financing could support wider integrated landscape planning and management of natural resources (forest landscape restoration[65]) through investments targeting afforestation, reforestation and natural regeneration of degraded forests and other degraded and abandoned lands. This would require improvements in cross-sectoral cooperation, including through forest landscape governance and by strengthening coordination between stakeholders from the general public, local communities and various domains of the private sector including forestry, agriculture, environment, water and tourism. Although the EU Forest Strategy for 2030 does not explicitly refer to the forest landscape restoration approach, it seeks to ensure forest restoration and enhancement of sustainable forest management for better climate adaptation and improved forest resilience.

Outside Europe, public financing can target the scaling-up of collaborative and community forest management for people to market forest products and benefit from security of tenure. It can also be used for the creation of a platform for social groups whose voices are often not heard to take a more active role in creating and carrying out rural forest programmes. This can foster local partnerships to integrate forest regeneration, sustainable forest management, agroforestry and small enterprise activities that can benefit sustainable development and support the economic growth of rural communities.

Land Degradation Neutrality Fund

The Land Degradation Neutrality Fund is an investment fund that supports the UN 2030 Agenda for Sustainable Development and contributes to tackling land degradation and achievement of **land degradation neutrality** by 2030. The investment strategy of the fund is built around one specific **UN SDG (15.3)**.[66]

The fund invests in **sustainable land management and restoration**, focusing on sustainable forestry and agroforestry projects, including land reclamation and improved forest/land management practices.

[63] United Nations Convention to Combat Desertification, Land degradation neutrality.
[64] The Bonn Challenge has the goal of restoring 350 million ha of deforested and degraded lands by 2030.
[65] FAO and UNECE (2021), *Forest landscape restoration in Eastern and South-East Europe*.
[66] UN SDG 15.3: "By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world."

Peru, 2017

The fund brings together public and private investors to fund projects that contribute to land degradation neutrality. With the European Investment Bank as a cornerstone investor since 2018, the fund reached **a final size of** about **$208 million**, with **private entities providing over 60%** of the capital mobilised. The fund **invests** (debt and quasi-equity) in **sustainable agriculture and sustainable forestry**, and in other sectors related to land degradation neutrality, such as green infrastructure or ecotourism.

The fund supports sustainable land-use and land-reclamation (rehabilitation and restoration) projects with a global scope. It focuses on sustainable agriculture and sustainable forestry projects. It also addresses land degradation through supporting efficient natural resource management and the improvement of ecosystems' resilience.

Targeted effects include improved food security, livelihoods, climate action, biodiversity and ecosystem services.[67] The fund provides long-term finance and technical assistance for land-use transformation, shifting the trend from land degradation and unsustainable land use to land rehabilitation and sustainable land use.

The **non-wood forest-based bioeconomy**, including ecotourism, production of non-timber forest products[68] and valuation and monetisation of various forest ecosystems' functions and services,[69] plays an important role in the development of rural economies in the coming decade. In this context, further research, innovation and development in the sector and responding to the current challenges — accompanied by further development of skills and capacities and empowering people to contribute to a sustainable forest-based bioeconomy — will be crucial for delivering on the European Union's climate and biodiversity targets for 2030.

Through promotion of sustainable forest management and provision of multiple ecosystem services and functions on the one hand, and sustainable production of renewable and recyclable bio-based materials and products, biofuels and renewable energy on the other, the **forest-based bioeconomy** will continue to play a key role in the development of competitive circular bioeconomies. Thus, the sector is ready to contribute to the achievement of EU and global climate and biodiversity ambitions, including the UN SDGs.

[67] Mirova (2021), *Land Degradation Neutrality Fund impact report 2021*.
[68] Non-timber forest products include wild fruits and berries, mushrooms, medicinal herbs and plants, and honey.
[69] Including the protection of settlements, productive agricultural lands and crops, and infrastructures against natural risks and hazards (e.g. soil erosion, landslides, torrential flows and floods, avalanches, windstorms, sand/dust storms); improved water and air quality; recreational function; and wildlife management.

The **forest-based bioeconomy** is heading towards a more circular and diversified portfolio of services and products. This will be achieved through enhanced valuation of forest functions and their ecosystem services, including biodiversity, and through effective, efficient and innovative sustainable solutions, targeting **higher value-added renewable biomaterials and products** (bioplastics, biocomposites, biotextiles).

The sector will continue to be rooted in the sustainability principles of forest management and biomaterials production. It will continue to promote the **cascading principle of using the wood** and the **circular economy approach** to replace fossil-based and carbon-intensive materials and products.

The priority will be **using the wood for production of long-lived circular materials and products** (woodworking industries), followed by short-lived wood-based products and materials (such as those produced by the pulp and paper industry) and the **uptake of sustainably harvested wood in the construction sector**.

The forest-based bioeconomy is expected to further strengthen the sustainable provision of renewable biomaterials, products and services, and the value-creating conversion of by-product streams into fibres, materials, chemicals and bioenergy. Through the sustainable production of innovative renewable wood-based materials and products, the forestry sector will also help introduce bio-component solutions in other industries.[70]

The sector also has a strong potential to **address substantial societal problems** such as **plastic waste** and **pollution**. It can contribute through the replacement of plastics in packaging and food logistics with alternative sustainable and renewable bio-based materials, avoiding the negative environmental impact. For example, the pulp and paper sector, which is moving away from office and printing paper and towards hygiene and packaging products, is expected to further develop new and innovative bio-based products and materials. Investments and companies active in the circular forest-based bioeconomy currently face **issues accessing private capital**. Funding gaps are apparent in bio-based industry projects when scaling up from pilot to demonstration plants and from demonstration to flagship/first-of-a-kind and industrial-scale projects. Public financing could add substantial value by providing early support to such projects, guaranteeing high environmental and social standards, and derisking operations. The positive signal sent to the market would help unlock additional financing from private investors.

[70] Such as aviation, civil construction, printing and packaging, food processing, automotive industries, cosmetics and personal care, consumer tissue, professional hygiene, electronics, pharmaceuticals and chemicals, furniture, textile and energy.

Greening the economy in a sustainable way

Östrand mill upgrade and foretstry

Greenhouse gas emissions reduction

Vertical integration in forest industry and production of **sustainable and renewable** forest products

Significant efficiencies: Heat savings, green electricity prod. & water savings

670 new jobs in rural economy (and over **1 500 jobs** secured in the **upstream/downstream** value chain)

In 2017, the European Investment Bank provided a €150 million loan to the Swedish paper manufacturer SCA. This loan helped to increase its production in an environmentally sustainable way to meet the growing demand for renewable forest products. With the expansion of the Östrand pulp mill in the town of Timrå and the regeneration of surrounding forests, the project will ensure the sustainable operation of the mill at the same time as contributing to climate action. The operation involved investment in selected renewable energy, energy efficiency and environmental protection measures. The pulp mill was upgraded and about 68 000 ha of forest was replanted or regenerated. The project also involved the construction and improvement of 4 250 km of forest roads and upgrading of five forest terminals. It also created about 650 new jobs in the rural economy. Advanced process technologies were installed at the pulp mill, resulting in substantial energy efficiency gains. The mill makes use of renewable resources, such as bark and by-products from the production process, for its energy generation, both power and heat. As a result, the modernised pulp mill has not only become energy self-sufficient and increased its production capacity, but it has also become able to export surplus (green) power. The mill's carbon footprint is smaller than that of any comparable mill in the world. Therefore, the investment added value to the production of renewable, green forest products, promoting the protection of the environment and significant carbon sequestration, and contributing to the overall EU objective of "greening" the economy.

In the light of the ambitious environmental, climate and biodiversity targets set out in the EU Forest Strategy for 2030, innovation will be the key driver for the development of the forest-based bioeconomy. Forest-based industries are expected to further enhance the production of sustainable and innovative materials, products and services, in particular those wood-based materials and products with a longer economic life and carbon storage potential,[71] to respond to the increasing demand for renewable and sustainable materials and products that will substitute for their fossil-based counterparts.

In the context of the circular economy, **resource efficiency** will play an important role in waste reduction through **recovery of wood fibre** (from processing) and **residual wood and paper** (construction sector, pallets, furniture and packaging) for further **reuse in the production process**.

Other important trends in the sector are **innovation and business digitalisation**,[72] including developing, enabling or integrating blockchain technologies; remote-sensing and artificial intelligence solutions (smart forestry); and stand-alone research, development and innovation projects.

Role of public banks in the forestry sector

Sustainably managed forests are the lynchpin of the struggle against climate change, biodiversity loss and environmental degradation. A public bank's role in the forestry sector is to help address the investment gaps specific to the forest-based bioeconomy. Through the projects they support, public banks and multilateral development banks, including the European Investment Bank, play a significant role in the implementation of the Paris Agreement and the SDGs. The impact of public financing enhances social and economic cohesion, particularly in rural areas, for the benefit of all people in the European Union.

[71] Sawmilling, engineered wood products and wood-based panels.

[72] Industry 4.0 and digital transformation through the development, implementation and use of digital technologies (e.g. supply chain optimisation, mobile applications, remote sensing, process automation).

ANNEX I: SUSTAINABLE FOREST MANAGEMENT:

THE KEY TO HEALTHY, RESILIENT AND BIODIVERSE FORESTS

Sustainable forest management is a comprehensive approach to enable forests' vital ecosystem services to function correctly and ensure resilience of rural populations through the sustainable production of renewable raw materials and provision of ecosystem services. **Sustainable forest management ensures growth and permanency of forests**, while also improving their capacity to provide **multiple functions and ecosystem services**.[73] Sustainable forest management further contributes to the **conservation of forests and biodiversity** for future generations and the **enhancement of ecosystems' resilience** against natural hazards and climate change.

Sustainable forest management is implemented in line with predefined management objectives,[74] which are informed by specific local site and climatic conditions. Sustainable forest management observes the following objectives:[75]

- maintenance and enhancement of forest resources: **contribution to global carbon cycles**
- maintenance of **forest ecosystem health and vitality**
- maintenance and encouragement of **productive functions of forests**
- maintenance, conservation and appropriate enhancement of **biological diversity** in forest ecosystems
- maintenance and enhancement of **protective functions** in forest management
- maintenance of other **socioeconomic functions** and conditions

Sustainable forest management includes a **complex set of forestry activities and silvicultural works** through which the forests are actively managed over their rotation cycle, from establishment to final harvesting and regeneration,[76] including the associated enabling activities (e.g. infrastructure development, planning and monitoring tools and systems). Sustainable forest management directs the management of forests towards those structural conditions that give the **forest maximum stability**, reduction of soil degradation, minimisation of damage to trees and seedlings, **respect for biodiversity and valuable habitats**, and the spread over space and time of trees through thinning and regeneration felling.

Sustainable forestry helps alleviate overcrowding in the forest stands, remove unwanted alien or invasive species, and reduce imbalances in the forest structure. By removing selected trees, thinning reduces the competition for sunlight, water and nutrients, which helps the remaining **trees to stay healthy and grow faster**. This also ensures enhanced resilience of forests against natural hazard risks such as windthrows or wildfires through **better tree spacing and the removal of flammable undergrowth**. At the end of the forest rotation cycle, regeneration felling (final harvesting) ensures the proper conditions for **new forests to be established**, whether naturally (from seeds or sprouts), artificially (through planting) or through a combination. The sustainable forest management continues in the new forest cycle.

Sustainable forest management provides an ideal means for effective and **continuous production and use of renewable wood raw materials** for the bioeconomy and rural economies. Simultaneously, it also ensures the **continuity of forests** (growth and permanency) **and their functions** (ecosystem services and biodiversity) through natural or artificial regeneration. Therefore, **sustainable forest management delivers on climate, environmental, biodiversity and socioeconomic** goals and objectives.

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[71] The communication identifies five priorities to step up EU action against deforestation and forest degradation, namely (i) fostering consumption from deforestation-free supply chains; (ii) reducing pressures on forests; (iii) strengthening international cooperation; (iv) enhancing financing of sustainable land-use practices and (v) improving access to information on forests and commodity supply chains.

[73] For example, soil stabilisation, regulation of water flows and protection against torrential flows and avalanches. The ability of unmanaged or poorly managed forests to sequester carbon and to provide (certain) ecosystem services may weaken over time.

[74] Typically set out in forest management plans or equivalent planning tools.

[75] Forest Europe, Sustainable forest management.

[76] For example, from seedling production, planting and tending, to thinning and regeneration felling.

ANNEX II: EU FOREST POLICY FRAMEWORK MATRIX

Mapping of EU forest policy	Policy/measure	Objectives	Overlap/implications for the forestry sector
Specific to forests	EU Forest Strategy for 2030	Improving the quantity and quality of EU forests and strengthening their protection, restoration and resilience	Focuses on the wider inclusion of climate, environment and biodiversity expectations from forests and forest industries in national forest policies
	Forest Europe	Fostering intergovernmental dialogue and cooperation on forest policies in Europe	Establishes best practices in forestry through internationally agreed guidelines, criteria and indicators for sustainable forest management
Cross-sectoral (Green Deal)	Biodiversity Strategy for 2030	Protecting nature and reversing the degradation of ecosystems, aiming to build societies' resilience to future threats such as the impacts of climate change, forest fires, food insecurity and disease outbreaks	Establishes ecosystem restoration and tree-planting targets
	Strategy on Adaptation to Climate Change	Realising the 2050 vision of a climate-resilient European Union by making adaptation smarter, more systemic and swifter, and by stepping up international action	Sets out prevention and preparedness measures for forests' resilience
	Taxonomy Regulation	Establishing a classification system for environmentally sustainable economic activities based on six environmental objectives	Provides sustainability definitions for climate change mitigation and adaptation, and objectives for protection and restoration of biodiversity and ecosystems
	Land Use, Land Use Change and Forestry Regulation	Setting an overall EU target for carbon removals by natural sinks to achieve climate neutrality in the land-use, forestry and agriculture sectors	Accounts for harvested wood products in the European Union as carbon sinks, including though material substitution effects
	Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast)	Setting an overall EU target for renewable energy consumption of 40% by 2030	Sets out sustainability criteria for feedstock sourcing from forest biomass for energy production

Mapping of EU forest policy	Policy/measure	Objectives	Overlap/implications for the forestry sector
	2020 digital strategy	Enabling the EU's digital transformation by 2030, focusing on governance, skills, infrastructure and businesses	Details an EU-wide integrated forest-monitoring framework using remote-sensing technologies and geospatial and digital solutions for enhancing sustainable forest management
	Circular Economy Action Plan	Promoting circular economy processes, fostering sustainable consumption and aiming to ensure that the resources used are kept in the EU economy for as long as possible	Sets out how substitutes for fossil-based materials that are bio-based, recyclable and biodegradable should be developed
	Bioeconomy strategy and action plan	Accelerating the deployment of a sustainable European bioeconomy	Facilitates the deployment of new sustainable biorefineries and the development of substitutes for fossil-based materials that are bio-based, recyclable and biodegradable
EU policy framework with international focus	EU communication (2019) on stepping up EU action to protect and restore the world's forests	Halting global forest cover loss by 2030 by (i) fostering consumption from deforestation-free supply chains, (ii) reducing pressures on forests, (iii) strengthening international cooperation, (iv) enhancing financing of sustainable land-use practices and (v) improving access to information on forests and commodity supply chains	Sets out agreed actions to be carried out by the Commission, Member States' authorities, industry and civil society (described in Annexes I and II of the communication)
	Forest Law Enforcement, Governance and Trade Action Plan	Tackling illegal logging in the world's forests and setting out measures to prevent the importation of illegal timber into the European Union	FLEGT Regulation: Voluntary Partnership Agreements with partner countries that will issue licences to certify the legality of timber exported to the European Union EU Timber Regulation: prohibits the placing of illegally harvested timber on the EU market (due diligence required)
EU and global agreements	Paris Agreement, United Nations Framework Convention on Climate Change, Reduction of Emissions from Deforestation and Degradation, UN SDGs, United Nations Convention to Combat Desertification, FAO's Forest and Landscape Restoration Mechanism	Various	UN Agenda 2030 for Sustainable Development

European Investment Bank
The EU bank

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