



# POLICY BRIEF

Based on results of ONEforest

## Forests, wood value chain and multi-criteria decision making in four European countries

ONEforest is a project funded under the European Union's Horizon 2020 Research and Innovation Programme.

Forests provide numerous benefits for human well-being, including timber, non-timber products, biodiversity support, water provision, recreation, and carbon storage. They play a key role in the transition away from fossil-based materials towards a greener economy. However, forests face significant challenges due to climate change, with increasing disturbances like fire, storms, pests, and drought, making forests and their ecosystems vulnerable. The multiple, sometimes conflicting, services provided by forests create a need for complex decision-making in forest management, affecting the downstream value chains. Within the ONEforest project, a multi-criteria decision support system was developed to navigate possible synergies and trade-offs in sustainable forest management. Achieving resilient forests requires a shared

understanding and agreement among stakeholders interested in the forest and the forest-wood value chain, e.g., owners, managers, industries, communities, and society. These often conflicting interests necessitate balancing different needs and goals. Developing holistic knowledge of forestry and the value chain can help stakeholders understand the consequences of different demands, which is crucial for informed decision-making in forest management and throughout the downstream value chain. To effectively integrate diverse stakeholder interests and support reliable forest-wood value chains, decision-making must consider the ecological, economic, and social dimensions of forests. This approach illustrates synergies and trade-offs between ecosystem services, and provides essential decision support tools to navigate these complex, multi-criteria challenges for sustainable forest management.



The main objective of ONEforest research project ([www.oneforest.eu](http://www.oneforest.eu)) is to develop a multi-criteria decision-making support system (MCDSS) for decision-makers, supporting conflict management, and sustainable forest management. The research within ONEforest may be summarized in five points:

- Four management options were simulated in each case study region (Estonia, Catalonia in Spain, Grisons in Switzerland, and Hesse and Thuringia in Germany) corresponding to different site-specific characteristics. The management options, based on forest model simulations over 40 years, serve as a basis for the MCDSS.
- Engineered topsoil covers based on biopolymers and wood fibres were applied to the identified case study regions as a new method of planting and sustaining plant growth.
- Based upon the analysis of forest stakeholders' perceptions, prevailing policies on national and regional levels and the public's perceptions, four policy pathways depicting different possible future societal developments were developed and included in the MCDSS.
- The ONEforest MCDSS supports complex decision-making, finding an optimal assignment of management options. By considering stakeholder preferences and requirements balancing forest management options and management goals, the model provides a quantitative basis for decision-making. Results should be understood as suggestions for decision-making.
- A dynamic wood value chain model was developed to support comprehensive decision-making in the downstream forest-wood value chain, complementing forest management decisions.

## POLICY RECOMMENDATIONS BASED UPON ONEFOREST RESULTS

The four case study regions exhibit distinct differences in their focus and attitudes towards forests, forest products, and the forest industry, i.e., the downstream value chain. These differences are closely linked to the unique characteristics of the forests in each region. Forests and their use differ across the four case study regions:

1. Estonia focuses on growing forests and the effects of forest damage.
2. Catalonia (Spain) focuses on forest fire prevention.
3. Grisons (Switzerland) focuses on protection against gravitational hazards (e.g. landslides, avalanches).
4. Hesse and Thuringia (Germany) focus on recreation and biodiversity protection.

Further, regions with a more abundant and reliable supply of forest resources are better positioned to support a thriving forest industry compared to those with more limited biomass resources. In sum, the case study regions face some common future challenges:

- Climate change mitigation,
- Increasing forest disturbances, and
- Growing demand for woody biomass.

Additionally, two major differences are found between the case study regions:

- Availability and supply of biomass which affect logistics and development of wood-based industry, and
- Ownership structures and management, especially in regions with many small-scale owners.

Tailored approaches to forest management and forest industry development are needed in each region to address their unique characteristics and priorities. Acknowledging and addressing these regional differences will be crucial for developing effective and sustainable strategies for the future.

The MCDSS, developed in ONEforest, builds upon data and input related to management options and pathways for the future; however, the optimization needs high-quality forest data together with high-quality knowledge of the forest owner's/ forest manager's preferences. Challenges to modelling include the uncertainties brought by the effects of climate change. More research and knowledge dissemination are needed to enable use of a developed MCDSS system generally applicable in forest management across Europe.

In sum, the ONEforest project recognized the following policy recommendations:

### 1. Does policy need to acknowledge and address regional challenges and differences?

- It is vital for policy to acknowledge the diverse challenges of forests and forest wood value chain across Europe, particularly in light of the significant impact of climate change on both forest ecosystems and the movement of raw materials along the forest-to-wood value chain. For example, protection against gravitational hazards is of key importance in alpine Europe, while the prevention of forest fires is of significant concern in the south. In contrast, the northern part of Europe places emphasis on the recreational value of forests and the production of timber.
- Additionally, it is important to recognize the differences in attitude and use of forest ecosystem services across Europe to support regional development, following the difference in use of forest ecosystem services. The EU needs to develop unified policy that addresses common challenges but at the same time allows for regional/local policies to recognize differences. These practices should enhance biodiversity, adapt forests to climate change impacts (e.g., fires, pests, droughts) and support global as well as regional/local development of forest ecosystem services, thus providing, supportive, regulative and social benefits.

### 2. How can policy support and secure continued research and development transfer?

- By encouraging technological development, digitalisation, and innovation to support the implementation of the EU Green Deal, policy can ensure continued research by providing stable long-term funding for forest-related projects.
- Support knowledge-transfer of research findings and innovation practices to end-users (e.g., foresters, industry stakeholders and policymakers) and decision-making, for example, using MCDSS strengthens the decision-making power of forest managers/owners to include complex multi-criteria decisions in forest ecosystem services management.

### 3. What can policy do to support the forest sector and strengthen the forest wood value chain?

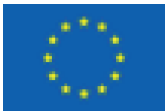
- To enhance and support knowledge development, training, and workforce development will equip forest sectors with well-specialized workforce for a modern forest sector, especially following digitalisation developments. Lack of specialised workforce may negatively affect forest sector development, thus having negative impact on the implementation of the EU Green Deal.
- By encouraging infrastructure for transport of biomass, policy may contribute to ensure a high-quality and steady supply while promoting efficient use of raw materials, supporting local and regional forest wood value chains.

In summary, promoting sustainable forest management in Europe requires integrating science-based decision support tools (like MCDSS) to anticipate the impacts of policy pathways, especially the implementation of the EU Green Deal, on long-term forest ecosystem services, given the challenges resulting from climate change and the varying regional demands for these services across Europe.



**Fact: The project ONEforest**

*The ONEforest Project (www.oneforest.eu) funded by the EU's Horizon 2020 Programme, addresses the challenge of common forest management by developing a multi-criteria decision support system. This system is aimed at providing decision-making to stakeholders by assessing Sustainable Forest Management (SFM), exploring synergies and trade-offs of Forest Ecosystem Services (FES), ensuring sustainable wood supply, improving biodiversity, and addressing stakeholder interests through indicators in social, economic, and environmental dimensions. Throughout the project, experts' and stakeholders' suggestions and needs were actively gathered to support the development of new policy recommendations.*



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**Summary of the project results:**

<https://oneforest.eu/content/d94-report-main-policy>

<https://oneforest.eu/>

**Editors:**

Camilla Widmark, Swedish University of Agricultural Sciences  
Raquel Castán Vidal, Cesefor  
Javier de Dios García, Cesefor

**Contributions from ONEforest partners (in alphabetic order):**

Maria Beranek, Dresden University of Technology (TUD)  
Martin Brunsmeier, Rosenheim Technical University of Applied Sciences  
Udo Buscher, Dresden University of Technology (TUD)  
Lorenzo Brusetti, Free University of Bozen/Bolzano  
Riccardo Castellini, Cesefor  
Michael Hölscher, Dresden University of Technology (TUD)  
Sandra Krommes, Rosenheim Technical University of Applied Sciences  
Miriám Piqué, Forest Science and Technology Centre of Catalonia (CTFC)  
Roberto Rubio Gutiérrez, Cesefor  
Alessandro Sorze, University of Trento (UNITN)  
Hardi Tullus, Estonian University of Life Sciences  
Kristjan Täll, Estonian University of Life Sciences  
Francesco Valentini, University of Trento (UNITN)  
Montse Vázquez, Cesefor

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