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Table of Contents

Executive Summary	5
Keywords	5
Abbreviations	6
1. Introduction	7
2. Methodological approach	7
2.1 Concepts of Value-chain Resilience.....	7
2.2 Framing Policy Analysis.....	8
2.2 Selection criteria for resilience related policies	8
2.3 Interviews and Stakeholder Workshops.....	10
3. Results: Policies and Resilience.....	11
3.1. Mapping policies for resilient forest value chains.....	11
3.2 Debating Resilience along the value chain: Challenges for Policies.....	12
3.2.1 Participants attending the workshop.....	12
3.2.2 Focus group 1: Discussion on resilience and economy	13
3.2.3 Focus group 2: Discussion on resilience and ecology	14
3.3 Four main resilience related policy strategies.....	19
3.3.1 European Green Deal -communication and roadmap.....	19
3.1.2 EU Biodiversity Strategy for 2030 and associated action plan.....	20
3.1.3 The EU Bioeconomy Strategy	20
3.1.4 EU Forest Strategy for 2030.....	20
3.2 Key policy documents.....	21
4. Policies at national and regional levels.....	23
4.1 Finland	24
4.2 Austria	24
4.3 Portugal.....	24
4.4 Regional Case: Catalonia in Spain	25
4.5. Regional Case: Galicia in Portugal and Spain	25
5. Discussion and Conclusions	26
6. References	28
Annex 1: Key Interviews Conducted.....	35





Executive Summary

This deliverable is a report on policy analysis and is an updated version of the mapping of the forest-related policy environment (published as a draft in D5.1, Draft report on mapping the current forest-related policy environment in EU and cases). It is related to Task 5.1 (Policy analysis for resilience) and builds on an in-depth policy analysis of documents that demonstrate direct or indirect reference to forest resilience. All documents have been collected in a policy database. The document analysis provides input to the assessment and formulation of future strategies and policy recommendations. The report is providing an overview on the policy environment that can be attributed to resilience challenges, both in the EU and in selected case study regions. It aims at applying a cross-sectoral value-chain approach for relevant policies, and provides a comprehensive mapping of legal, financial and informational policy instruments. The results demonstrate a range of policies along the forest-based value chain, ranging from the environmental policy sector to the industrial policy sector at the EU and at case study level. The mapping of the policy documents illustrates the relevant policy documents, such as policy strategies, policy goals and policy regulations across the different sectors and also the different hierarchical levels and their effects for policy implementation. A visual summary of the mapping is provided in Figure 1 and subsequently discussed for the challenges and opportunities for resilience-relevant policy efforts.

Keywords

Policy Environment, Value Chains, Policy Instruments, Sectors, Policy Mapping, Challenges and Opportunities.



Abbreviations

CAP Common Agricultural Policy
CBD United Nations Convention on Biological Diversity
CEN European Committee for Standardization
CSD United Nations Commission on Sustainable Development
EAFRD European agricultural fund for rural development
EAGF European agricultural guarantee fund
EC European Commission
ECE United Nations Economic Commission for Europe
ECOSOC United Nations Economic and Social Council
EOTA European Organisation for Technical Assessment
ETS Emissions Trading System
EU European Union
EUTR EU Timber Regulation
FLEGT Forest Law Enforcement, Governance and Trade
FSC Forest Stewardship Council
GHG Greenhouse gas
HWP Harvested Wood Products
IAF International Arrangement on Forests
IFF Intergovernmental Forum on Forests
IPF Intergovernmental Panel on Forests
ITTA International Tropical Timber Agreement
ITTC International Tropical Timber Council
ITTO International Tropical Timber Organization
IUCN International Union for the Conservation of Nature
LULUCF Land Use, Land Use Change, and Forestry
NGO Non-governmental organisations
NWFP Non-wood Forest Products
PEFC Program for the Endorsement of Forest Certification
REDD+ Reducing emissions from deforestation and forest degradation
SDG Sustainable Development Goal
SFC Standing Forestry Committee
SFM Sustainable Forest Management
TFEU Treaty on the Functioning of the European Union
UNCED United Nations Conference on Environment and Development
UNFCCC United Nations Framework Convention on Climate Change
UNFF United Nations Forum on Forests
VPA Voluntary Partnership Agreement
WPF Working Party on Forestry



1. Introduction

This deliverable (D5.2 Report on Policy Analysis for Forest Resilience) relates to Task 5.1. (Policy analysis for resilience) and consists of an overview on the policy environment that can be attributed to resilience questions (Nikinmaa et al. 2020; Nikinmaa et al. 2023) and to the operational framework for resilience in forests and forest-based value chains developed in the RESONATE project (Hurtado et al. 2021, Jaime Gonzales et al. 2023). This Deliverable is an updated version of the mapping of the forest-related policy environment published as a draft in D5.1 (Draft report on mapping the current forest-related policy environment in EU and cases). It provides a mapping of the relevant policy goals, strategies and regulations, as implemented at the national and selected regional case study levels, divided by policy sectors. The criteria for identifying these policies as relevant are based on literature findings (e.g. Blattert et al. 2022, Burgess et al. 2007, Quinlain et al. 2016, Weiss et al. 2021), literature analysis and the results of expert interviews with key policy experts.

The central output of the policy analysis is a map that illustrates policies along the forest-based value chain. The map consists of eight principal policy domains that relate to the forest-based value chain (Figure 1). These policy domains are linked to the identified key policy documents (illustrated in blue) and their main policy goals. The overall policy analysis builds inferences on the implications for resilience and the resulting challenges and opportunities for resilience relevant policies. It also includes the results of focus group discussions during the RESONATE stakeholder workshop in Vienna, September 2022 on trade-offs between different resilience-related policy goals.

This report is structured as follows: Firstly, it outlines the methodological approach for the selection and criteria for “resilience-relevance” and the subsequent mapping of policies (section 2). Secondly it presents the results from the policy analysis and the mapping in a related mapping figure (section 3). Thirdly it complements the policy analysis at EU level with the resilience relevant policy outcomes at selected national and regional policy levels (section 4). It relates the selection of national case examples to the RESONATE Resilience Dashboard (Del. 1.5, Resilience Dashboard, Demonstrator) with choosing examples from Northern, Southern and Central Europe (more precisely, at the national level: Finland, Portugal and Austria). The concluding section (5) discusses the findings in terms of policy needs for enhancing resilience. The Annex to this report presents the list of policy documents that back up this report in detail.

2. Methodological approach

2.1 Concepts of Value-chain Resilience

“Resilience”, originally stemming from the Latin “resiliere” (jumping back), denotes the ability to recover from a stressful event. Hollings (1973) denotes this ability as “stability” and coins the term “resilience” as the ability of an ecological system to absorb changes (ibidem. p.17.) The RESONATE Operational Resilience framework (Hurtado et al. 2022) provides a unified terminology and identifies three types of resilience approaches: engineering resilience, ecological resilience and social-ecological resilience. Whilst engineering resilience is defined as the recovery of a system after a disturbance, ecological resilience is defined as the maximum change that a system can absorb without shifting to an alternative stable state. Social-ecological resilience is the capacity of the social-ecological system to reorganize, adapt



and provide ecosystem services after disturbance or under continued stress, often associated with environmental/socioeconomic transformations. By some scholars in socio-economic research on the forest-based value chains, resilience has been defined as the preparedness and involvement of potential measures against (potential) threats, damages and crisis (see Annarelli et al. 2020). More precisely, Annarelli et al. denote organisational resilience as the effective management of accidents and unforeseen events to shorten unfavorable aftermaths and maximize the organization's speed of recovery" (Annarelli et al. 2020, 2ff.). Leaning on Annarelli et al. (2020), resilience is understood in this policy context as the introduction of measures and policies that should strengthen the value chains and make them more robust towards current and future challenges. The forestry sector and the related value chains are currently facing challenges, including economic transformations, climatic change effects and growing societal demands towards forests. RESONATE Operational Resilience framework (Hurtado et al. 2022) provides operational ways for identifying the relevant environmental and socio-economic changes affecting the social-ecological system. Accordingly, different disturbances may affect the same social-ecological system (ibid.,p.6). The following subsection will outline our development of selection criteria for identifying resilience relevant factors in policies.

2.2 Policy Analysis

A full range of scholarly literature has been published on methods of policy analysis for different policy fields (Dery, 1984; Fischer and Miller, 2006; Héritier, 1993; Knoepfl et al., 2011; Moran et al., 2006; Nakamura, 1983; Tsebelis, 1990). However, not all policies have direct outcomes; and some policies may have no effect at all (Elmore 1979). All this poses challenges for forest policy analysis. The term "policy integration" is widely used in the related scholarly literature, including the quest for better integration, coherence and coordination (Aggestam et al. 2020; Hogl et al. 2016; Sotirov and Storch, 2018; Winkel and Sotirov, 2016). Another challenge is, that there exists no unified EU forest policy, such as the Common Agricultural Policy (CAP), but rather a mix of "forest-related" policies from other domains (Aggestam and Puelzl 2018). For the purpose of this research, we understand the concept of policy integration as the consistency and coherence within a set of interacting strategies 'owned' by one or more departments or organisations. This is why we aimed at identifying the resilience-related domains (Departments/Directorate Generals/Public Administrative Units), outlined more below in Figure 1 and Table 3.

2.2 Selection criteria for resilience related policies

The methodological steps of policy mapping have been developed by Ludvig et al. (2018), following qualitative steps for applied policy research (Burgess et al. 2007, Srivastava and Thomson 2009; Trochim 1989, Trochim and Cabrera 2005). The policy documents were derived from the respective databases across Europe¹. After four initial expert interviews (see table in annex to this Deliverable) to cross-check with the existing literature on the relevance on topics around resilience, the focus was laid on the initiatives by parliamentarian

¹ e.g. <https://www.eui.eu/Research/Library/ResearchGuides/EuropeanInformation/EU-Databases>



committees², the EU Commission³, the communications on the EU Biodiversity strategy⁴, the Forest strategy⁵ and the legislative environment of the Green Deal⁶.

For the mapping of relevance to resilience, coding criteria were developed according to identification rules for the policy instruments (see Table 1). The criteria were developed in congruence with the resilience framework approach (Hurtado et al. 2022) and the stratification of policy instruments (Baldwin and Cave 1999). Table 1, hereafter, provides an overview on the criteria.

Table 1: Criteria for definitions and coding rules of resilience in documents.

Definition	Coding Rule
Resilience (RS) refers to the reconfiguring capacity of the social-ecological system to reorganize, adapt and provide ecosystem services after disturbance or under continued stress. Aims to enhance outcomes on strengthening the system and related societal practices. (Hurtado et al., 2022, p.6)	<ul style="list-style-type: none"> • Explicit mention of resilience • Explicit mention of strengthening activities • Implicit referral to resilience
Statements (S) refer to formal, but general proclamations on objectives, importance, needs of instruments to strengthen RS.	<ul style="list-style-type: none"> • formal, but general proclamations on objectives, importance, needs, or instruments without prescribed means for implementation.
Regulatory instruments (RI) include all formal regulatory or strategic documents and measures to strengthen RS.	<ul style="list-style-type: none"> • explicit prescription of regulatory instruments and means for their formulation and/or implementation.
Monetary instrument (MI) includes financing mechanisms and support schemes to strengthen RS.	<ul style="list-style-type: none"> • explicit prescription of types of monetary instruments and means for their implementation
Informational instruments (II) for informing, education, training and promotion of RS.	<ul style="list-style-type: none"> • explicit prescription of types of informational instruments and means for their implementation
Networking instruments (NI) to establish and develop cooperation and capacity building amongst actors and organisations to strengthen RS.	<ul style="list-style-type: none"> • explicit prescription of types of networking instruments and means for their implementation

Source: Own elaborations based on Baldwin and Cave (1999), Vedung (1998), and Mayring (2014).

The main policy striving for resilience (R) with related strategic goals (S), is the **European Green Deal** with the strategic aims to **strengthen societies resilience to future threats**:

- **aims to combat climate change**, in connection to the “Fit-for-55 Package” as key piece of EU Green Deal)
- **nature protection and enhancement of biodiversity** (relationship to EU Biodiversity Strategy)
- **replacement of fossil fuels** (relationship to EU Bioeconomy Strategie(s))
- **restoration of Europe’s forests** (relationship to EU Forest Strategy)

² <https://www.europarl.europa.eu/committees/en/documents/search?committeeMnemonicCode=ENVI&textualSearchMode=TITLE&textualSearch=&documentTypeCode=&reporterPersId=&procedureYear=&procedureNum=&procedureCodeType=&pageNumber=&sessionDocumentDocTypePrefix=&sessionDocumentNumber=&sessionDocumentYear=&documentDateFrom=&documentDateTo=&meetingDateFrom=&meetingDateTo=&performSearch=true&term=9&page=0>

³ https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives_de

⁴ <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-new-eu-biodiversity-strategy>

⁵ : <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal/file-new-eu-forest-strategy>

⁶ <https://www.europarl.europa.eu/legislative-train/theme-a-european-green-deal>



Two principals were applied for the mapping of policies:

- **Relevance of the policy domain** (Hogl et al. 2016), defined as the policy field the policy document has been designed (e.g. the DG in charge)
- **Relevance of the related policy documents.**

Main identification rules for resilience relevance of the documents were

- Explicit mention of resilience (RS)
- Explicit mention of strengthening activities
- Implicit referral to resilience

This was combined in the search with **referral to and proclamation of the use of forest and/or natural resources**. Under these two premises, the following sections will present the mapping of policies structured by:

- a) Policy domains (Policy fields of origin)
- b) Policy goals that explicitly or implicitly mention and refer to resilience
- c) Policy documents

2.3 Interviews and Stakeholder Workshops

In relation to the RESONATE Del. 1.3 (D 1.3 Trade-Offs Analysis, Ludvig et al. 2023) we also asked the experts in the single interviews (see table in annex to this Deliverable) about their perceptions of contradictory policies along the value chain, coined as trade-offs (Maes et al. 2012, Schwaiger et al. 2019, Rodriguez et al. 2006, Verkerk et al. 2014). Hence, we identified the main concerns around trade-offs, summarised them in enquiry templates and presented and discussed those with 12 more stakeholders in two focus group discussions at the RESONATE stakeholder workshops in Vienna. At the workshop in Vienna, September 29th 2022, two focus group interview discussion rounds were conducted. They were informed by the main results from the foregoing steps of analysis, resulting in two topics of relevance for resilience: The connections between **resilience and economy (Focus group 1)** and the connections between **resilience and ecology (Focus group 2)**.

The focus group format allowed us to obtain data from purposely selected key groups of individual experts (Nyumba et al., 2018) by discussing these topics with the participants in moderated interactions (cf. Cornwall and Jewkes, 1995). The specific way of interaction distinguishes focus group discussions from individual interviews, because the results and insights are collectively generated. All participants were key informants who had a wider vision of resilience, selected by stakeholder mapping processes (RESONATE Del 6.3., Bellavia et al. 2020).



3. Results: Policies and Resilience

3.1. Mapping policies for resilient forest value chains

The European Green Deal sets a long list of targets related to the land sector (Griscom et al. 2017). Related to resilience measures for the forest value-chains and along the lines of the resilience operational framework (Hurtado et al. 2022) the following main goals were identified: to combat climate change, to enhance biodiversity and nature protection, to replace fossil fuels and to restore forests. For the mapping, we have related the Green Deal with its main goals, embracing the whole package of policies related to the Green Deal, outlined in Table 2, hereafter.

Table 2. Most recent policy strategies for resilience, related to the Green Deal

Policy Strategy	Main Goals
European Green Deal - Communication and Roadmap	<ul style="list-style-type: none"> • aims to combat climate change (relationship to Fit-for-55 Package as key piece of EU Green Deal) • nature protection and enhancement of biodiversity (relationship to EU Biodiversity Strategy) • replacement of fossil fuels (relationship to EU Bioeconomy Strategy) • restoration of Europe’s forests (relationship to EU Forest Strategy for 2030)
EU Biodiversity Strategy for 2030 and associated action Plan	<ul style="list-style-type: none"> • aims to build our societies’ resilience to future threats, such as climate change impacts, forest fires, food insecurity or disease outbreaks, by including measures such as protecting wildlife and fighting illegal wildlife trade.
EU Bioeconomy Strategy and member states national strategies	<ul style="list-style-type: none"> • transition from an economy based on fossil fuels to renewable biological resources (European Union 2018) • (Clean) Industry Strategy • New Industrial Strategy for Europe (EC, 2020d)
EU Forest Strategy for 2030	<ul style="list-style-type: none"> • Communication on Stepping up EU Action to Protect and Restore the World’s Forests • Council Conclusions on the mid-term review of the EU Forest Strategy

The identified policy strategies are not all exclusively forest-focused. They range and include policy concerns from different domains within the EU institutional architecture (Aggestam and Giurca, 2021; Aggestam and Pülzl, 2018; Aggestam et al. 2017):

- Policy domain Agriculture



- Policy domain Forestry (forest-focused, see Aggestam and Pülzl 2018, Aggestam et al. 2017)
- Policy domain Environment
- Policy domain Climate
- Policy domain Energy
- Policy domain Timber, Trade, and Industry
- Policy domain Research and Development.

Whilst some scholars of policy framework domains summarise forest-focused and agriculture into one domain (Aggestam et al. 2017), and also energy and climate into one domain (Aggestam and Pülzl 2018), others do separate agriculture from forestry (Weiss et al. 2021). For the purpose of the mapping of resilience relevant policies, this research will distinguish the domains. Firstly, it helps to get more insight into the single documents (originating from different executive entities, e.g., DGs), and secondly because this mirrors the stratification across different competence levels. More precisely, Forest-focused policy has remained largely at the **competence level** of EU member states (Pülzl et al. 2013) whilst Agricultural policy is connected to the EU-level with EU-CAP, a former “pillar” of the European Union itself. Notwithstanding, the EU-CAP includes a bundle of relevant policies affecting resilience of forest ecosystems and the forest-based value chain. Most importantly are regional and rural development, food security, afforestation, wildfire prevention, forest conversion and the increase of coupled land. Furthermore, the EU forest strategies also sets general guidelines, aims to coordinate forest-related policies at the Member State level (Pülzl et al. 2013) and includes goals such as protection and restoration of forest, identified as resilience relevant (see Table 2). Across the domains, EU shares several forest-related competences with Member States, including environment, climate and agriculture. Whilst exercising these competences, the Union respects the principle of subsidiarity. In particular, forest protection is a fundamental part of EU environmental action and the EU’s competence founded on Articles 191-192 of the Treaty of the Functioning of the EU, as confirmed by the European Court of Justice. The list of domains identified above includes the industrial domain because of the Timber, Trade and Industry Provisions that regulate big parts of the timber related forest value chains within the circular bio economy initiatives. Resilience is a cross-cutting issue, and also the division of policy domains does not follow a strict separation of DGs at the EU level, nor national ministries at the member states levels, nor municipal divisions at the regional and case study levels. This is because some of the related sectors are overlapping in political practice (Weiss 2000, Weiss et al. 2021, Winkel et al. 2011, UNECE/FAO 2020, Quinlain et al. 2016, Srivastava and Thomson 2009).

Moreover, goals like the strengthening of resilience, understood as the capacity of the social-ecological system to reorganize, adapt and provide ecosystem services after disturbance or under continued stress (Hurtado et al. 2022) requires implementation efforts in practice. Hence, for enhancement of resilience strategies and programmes -agreed upon by democratic agencies- have to be in place. For the practical implementation, this means, that policy instruments (legal, financial or informational) are required. We linked the policy strategies with the actions relating to resilience in the social-ecological system. Table 3, hereafter, illustrates the link between each policy domain and the explicit policy goals for implementation.



Table 3: Policy domains and related policy goals in support of resilience relevant actions

Policy Domain	Policy goals in support of resilience relevant actions
Agriculture	regional and rural development, food security, afforestation, increase of coupled lands
Forestry	certification schemes, prevention of illegal logging, afforestation, protective and protection forests, close-to-nature-forestry
Environment	plant protection, maintenance of biodiversity, forest protection
Climate	Measures to reduce GHG emissions through afforestation and/or increase of use in HWP, adaptation of forests for resilience, climate action and reporting, climate-smart forestry
Energy	Support of renewable energy, production of biomass, substitution of fossil fuels, increase and support of life cycle analysis for forest products, carbon certification
Industry	Enhancing circular bioeconomy, support of clean industry, development of sustainable taxonomy, action for sustainable production within the forest-based value chains, support of Life Cycle Analysis, end-use measures from cradle-to-cradle
Research and Development	Support of research and training programmes, Innovation actions, Innovation research, support for development of new technology, support of research to increase sustainable use of resources and prevention of damages to the natural environment

The lists of identified policy goals outlined here above are differentiated and attributed to the different domains. As can be seen, the distinctions are not exclusive. They show overlaps. This becomes obvious when e.g. the goal of “close-to-nature” forestry in the domain of Forestry can as well become attributed to the sector “Environment”. The goal to increase support for Life Cycle Analysis can be important for measuring resilience under both the Energy and the Industry domain. Further, the circular bio economy was mapped under the domain label Industry (Timber, Trade, and Industry) but it has synergies with policy goals in many of the other sectors identified here above. With the intention of keeping clarity, the overlaps are not outlined explicitly in the overview mapping of this report (Figure1).

We kept the distinct policy domains according to their sectoral divisions and attributed them with their policy documents and the most relevant policy goals (see Figure 1, hereafter).

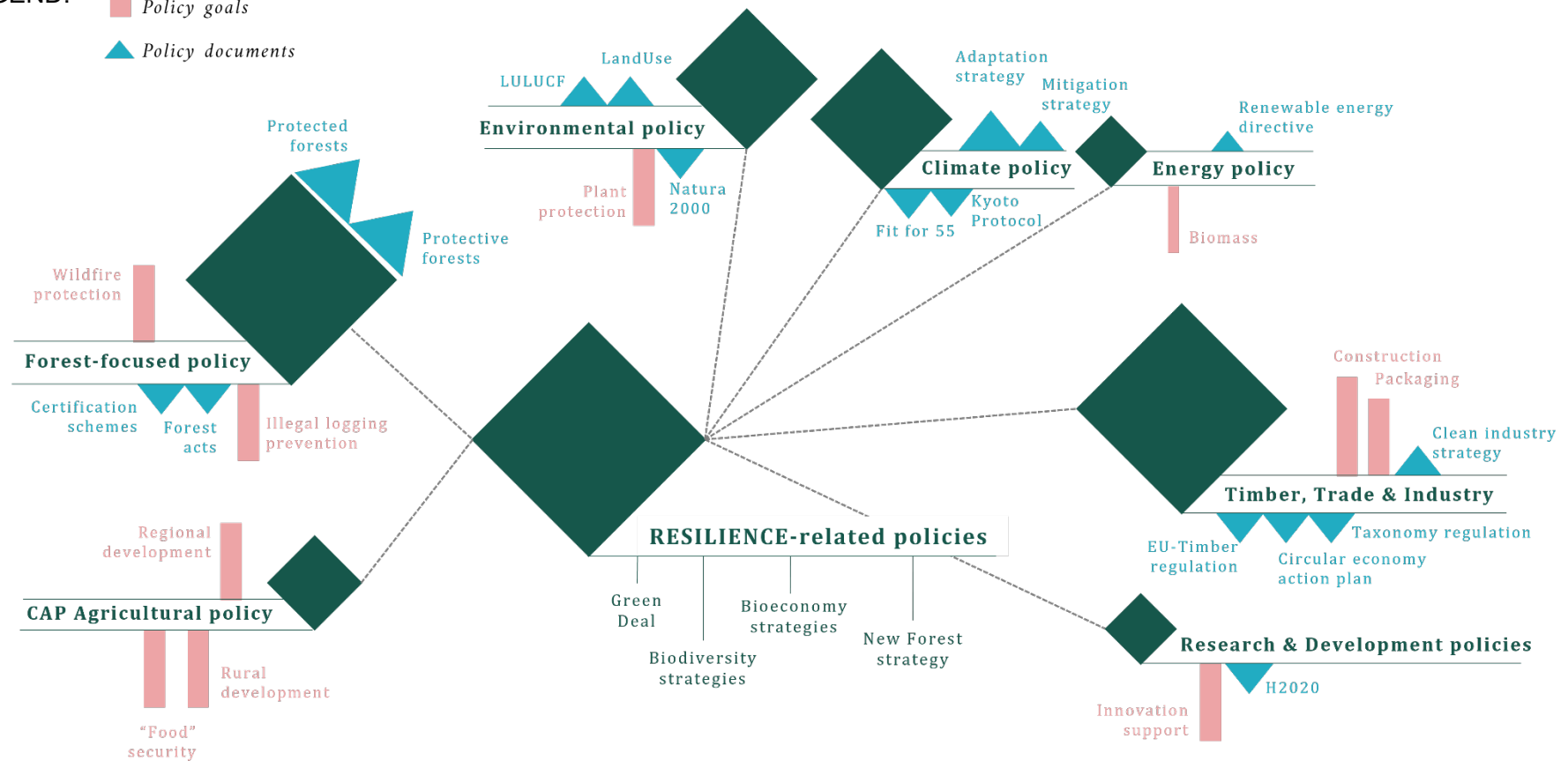


Figure 1. Visualisation of Resilience-related policy environments (domains, goals and documents) along the forest-based value chain at the EU and national Member states levels (adapted from Weiss et al. 2021)

Figure 1 illustrates a summary of all resilience-related policy environments (domains, goals and documents) along the forest-based value chain at the EU and national Member states levels (adapted from Weiss et al. 2021). The depicted “policy domains” refer to “specific components of the political system organised around substantive issues” (Burstein 1991). In a political system, these issues are accordingly labelled and organised in administrative units. The policy goals outlined in the illustration refer to the desired outcomes of what is to be achieved in relation to strengthening resilience.

The principal policy strategies that relate to resilience in their goals (table 2) are summarized in the center of the mapping. They are all in connection to the Green Deal, namely the EU Biodiversity Strategy for 2030, the EU Bioeconomy Strategy, and the EU New Forest Strategy.

Starting from **left to right**, the visualization (Figure 1) is covering the policy domains as defined in Table 3, that connects them to resilience goals in terms of stabilization of the resilience of social-ecological systems against threats, crisis and damages (Hurtado et al. 2022). The domains are divided into Agriculture and Rural Development, Forestry, Environment, Climate, Energy, Industry and Trade and Research and Development. Here we separate forestry from agriculture and other sectors, other than in earlier mappings of policy frameworks (Aggestam et al. 2017 and Aggestam and Pülzl 2018).

The identified policy goals outlined in Figure 1 are linked to their **main domains**. However, the distinctions have some overlaps, e.g. the goal of “close-to-nature” forestry in the domain of Forestry is also, in parts, pertaining to the sector “Environment”. Further, a policy goal that aims at increasing Life Cycle Analysis, is important for measuring resilience. But can be located in both the “Energy” domain, and the “Timber, Trade and Industry” domain. Further, the circular bio economy was mapped principally within the domain of “Timber, Trade and Industry”. The reasoning behind are the goals of green production. But at the same time, bioeconomy has overlaps with other domains, such as environment, climate and energy. In other words: With the intention of keeping clarity, the overlaps are not outlined explicitly in the overview mapping of this report (Figure1). We rather kept the distinct policy domains and attributed them with their policy documents and the most relevant policy goals (Figure 1).

3.2 Stakeholder Perspectives on Policy Challenges

The workshop was held on 29th September in Vienna and was facilitated by RESONATE partner Prospex Institute (PI). This activity was connected to Tasks 1.2, 1.4 and WP 5. Amongst other goals, the meeting wanted to receive feedback from stakeholders for the user-centric design of a decision-support tool for forest managers and stakeholders (Task 1.4 and WP 5).

3.2.1 Participants attending the workshop

The workshop was attended by a total of 12 external participants (stakeholders), representing the following groups:

- Forest owners’ association – public (Forest and disturbance management actors)
- Forest owners’ association – private (Forest and disturbance management actors)
- Forest actors in hazards’ prevention management (Forest and disturbance management actors)
- Recreational and leisure services (Value chain actors)
- Wood-based producers and services: sawmill/industry (Value chain actors)
- Representatives from regional decision makers (Government and Policy Actors).



The purpose was to discuss the differing goals on resilience from an economic perspective and resilience from an ecological perspective. The participants were invited to join a focus group discussion about trade-offs between resilience and **economy**, or resilience and **ecology**. The results have been taken up as follows:

3.2.2 Focus group 1: Discussion on resilience and economy

The stakeholders received a hand-out that indicated the goals of the discussion; Social-ecological resilience focuses on the strengthening of the adaptive capacity of human-natural systems, acknowledging them as being intertwined. In this sense, resilience trade-offs occur when the provision of one forest ecosystem service or product is reduced or increased at the use of another product or service. Synergies on the other hand are defined here as the means that could prepare to enable conditions for balancing these trade-offs. In our Focus Group discussion, we want to hear about your notions behind the presented trade-offs, how they are being experienced and how pathways towards balancing resilience trade-offs and synergies to support decision-making could be constructed.

The following table (Table 4) outlines the examples for trade-offs to be discussed as regards the resilient relevant trade-offs for bioeconomy, material wood use and energetic use related to the perspective of forests as carbon sinks and sequestration. The table was handed out to the stakeholders as a basis for the discussion, including differing perspectives and possible synergy measures.

Table 4 Examples of economic resilience trade-offs to be discussed

Trade-off	Differing perspectives	Possible response options
Example 1: a) Natural carbon sink: sequestration (in forests) and b) Bioeconomy: carbon storage and displacement effects through Harvested Wood Products/wood use	Scientific debate: Should we focus on carbon sequestration by a) building up carbon levels in forests and use them to offset other industrial emissions or b) using wood in products and for energy generation to build up a forest-based bioeconomy?	Enhancement and maintenance of old and deadwood in active forest management (e.g. closer-to nature forestry/ Climate-smart forestry)
Example 2: a) Material and b) energetic wood use	a) too much wood is used for energy production b) wood used for energy is not good enough for high-quality wood products needed for material use.	In a thorough cascadic system the balance would ideally work out. Innovation in wood production and use is necessary for increasing (material) use options.



Key outcomes: Summary of Answers to Questions FOCUS GROUP 1 (resilience and economy)

1) How do you personally perceive the presented trade-offs?

Managing forests only with the objectives of carbon sequestration rate puts them in danger of collapsing in the longer run (time span more than 100 years). Harvesting and making products out of forests still needs to be considered. Deadwood is only a biodiversity measure, not a carbon sequestration measure. The value chain actors stated that old trees do not absorb as much carbon as young ones, so there harvesting and replanting must be included for their climate benefits. Forest products would be another essential part in a decarbonized bioeconomy. Therefore, local industries and integrated forest management should be used to combine bioeconomy and biodiversity.

2) How do you perceive the importance of bioeconomy for resilience?

The use of wood in a decarbonised bioeconomy is crucial, but there is no one-size-fits-all solution. Local market conditions must be considered to ensure a resilient economy. Sourcing enough biomass sustainably for a bioeconomy is a question of motivating private forest owners and taking into account regional characteristics and the need for structural diversity in forests. Some of the forest management actors expressed that there is fear of creating a market where the prices of timber and CO₂ differ significantly. Others asked for more projects that deal with forest management also as a carbon sequestration activity.

3) In your opinion, how do you regard the identified response options and are there others to consider?

The key to creating a decarbonized bioeconomy lies in sustainable forest management and the use of measures such as close-to-nature forestry and multi-structural forest management. Thinning is used to increase resilience and vitality of forests. The cascading use of wood could balance the trade-off between wood uses, but some stakeholders expressed doubts about its feasibility in the current market. Finally, any approach should take into account local market conditions and regional characteristics. The representatives from regional decision makers expressed concerns that it is more and more difficult to motivate smaller private forest owners to carry out forest management.

Summary of the main results of focus group 1 on resilience and economy: Taking into account local conditions and features, sustainable and integrative active forest management is perceived to entail higher climate benefits and offers possibilities to reconcile presented trade-offs.

3.2.3 Focus group 2: Discussion on resilience and ecology

The stakeholders received a hand-out that indicated the goals of the discussion; Social-ecological resilience focuses on the strengthening of the adaptive capacity of human-natural systems, acknowledging them as being intertwined. In this sense, resilience



trade-offs occur when the provision of one forest ecosystem service or product is reduced or increased at the use of another product or service. Response options on the other hand are presented here as the means that could prepare and enable conditions for balancing these trade-offs. In our Focus Group discussion, we want to hear about your notions behind the presented trade-offs, how they are being experienced and how pathways towards balancing resilience trade-offs and synergies to support decision-making could be constructed.

The following table (Table 5) outlines the examples for trade-offs to be discussed as regards the resilient relevant trade-offs in regard to ecology (nature protection) and increase of sustainable consumption and recreational activities. The table was handed out to the stakeholders as a basis for the discussion, including differing perspectives and possible synergy measures.

Table 5 Examples of ecological resilience trade-offs to be discussed.

Trade-off	Differing perspectives	Possible response options
<p>Example 1: a) Increasing protection b) increasing consumption</p>	<p>a) Biodiversity strategy requests up to 30% of the forest area under protection, at the same time b) Bioeconomy strategy requests to reduce dependence on non-renewable and thus increase the consumption of renewable resources, i.e. timber (without fostering Carbon leakage effects through increased import from unsustainable sources).</p>	<p>Imports only from countries where it is guaranteed that the timber resources are from sustainably managed forests</p>
<p>Example 2: a) Nature Protection b) recreational activities</p>	<p>a) Forest protection (e.g. in nature protection areas) is in opposition to b) recreational activities (such as Mountain biking)</p>	<p>Agreement on recreational zones</p>

Key outcomes: Summary of Answers to Questions FOCUS GROUP 2 (resilience and ecology)

1) How do you personally perceive the presented trade-offs?

The group discussed the polarity of perspectives regarding nature protection and emphasizes the need for moderation in any approach to foster integrated discussions with all actors. Some emphasised that the examples in the tables are not real “trade-offs”, because the perception of them as trade-offs is often due to a lack of communication. Others saw a disconnection between the EU and national level. Finally, education and communication would be essential for addressing social challenges related to nature protection, and incentives like Payments for Ecosystem Services could also mitigate trade-offs.

2) How do you perceive the importance of biodiversity for resilience?

The group discussed the complexity of sustainable forest management and the need for interventions at different scales (habitat, forest stand, populations, landscape). One example for discussion was the question of leaving pastures unused in order to turn into forests: would



this now increase or decrease biodiversity? The question was left unanswered. Some participants meant that it would be bad for social-economic resilience, as some need the pastures for their livelihoods. Finally, the group emphasized the need to define the desired state of biodiversity before working towards it.

3) In your opinion, how do you regard the identified response options and are there others to consider?

The statements recorded in the discussion revealed the complexity of opinions on sustainable forest management, and how it should have some nature protection as a priority. Especially the participants on management and disturbances (see composition outline above, subsection 3.2.1) expressed that they felt unheard on the fact that forest management is also needed for increasing the environmental values of forests and forest ecosystems. The group agreed that it will be difficult for intentions like the ones in the EU Biodiversity Strategy, aiming for 30% protection, with 10% strict protection, and that this will likely not happen in the most productive forests. In the future, socio-economic views must be included in ecology, and negative perspectives on production must be addressed with better communication, which in turn needs more resources.

Summary of the main results of focus group 2 on resilience and ecology: Perceptions of nature conservation vary, and the scaling of ecological measures is connected with inherent difficulties. Clear goals and an integrated and optimistic view on ecological “trade-offs” offer opportunities for more inclusive and productive policy discussions.

3.2.4 Measuring the perceptions on policy-related statements in the stakeholder workshop

Furthermore, each stakeholder was asked to express his/her opinion on a series of policy-related statements. Because of the limited time frame, we decided to pose one question on biodiversity and bioeconomy to both groups and one topical question to each of the groups, resulting in three questions in total.

Stakeholders focus groups 1 and 2: Current policy efforts to increase **biodiversity** in forests while also transitioning towards a sustainable **bioeconomy** are associated with significant trade-offs.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
short-term (until 2030)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
medium-term (2030-2050)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
long-term (2050-2100)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Stakeholders focus group 1 (resilience and economy): Policy developments and the increased demand for natural raw materials leads to competition for use between **material** and **energy use of wood** in the value chain.

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
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short-term (until 2030)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
medium-term (2030-2050)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
long-term (2050-2100)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Stakeholders focus group 2 (resilience and ecology): Increasing societal demands (e.g. recreational activities) on forests lead to competition between interests and uses of forests.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree	Don't know
short-term (until 2030)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
medium-term (2030-2050)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
long-term (2050-2100)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A first analysis of the votes suggests that the **severity of trade-off perception overall decreased** over time for all the questions; at the same time, **higher uncertainties** became visible in connection with the **long-term planning** horizon. The results are presented in Figures 2 – 4.

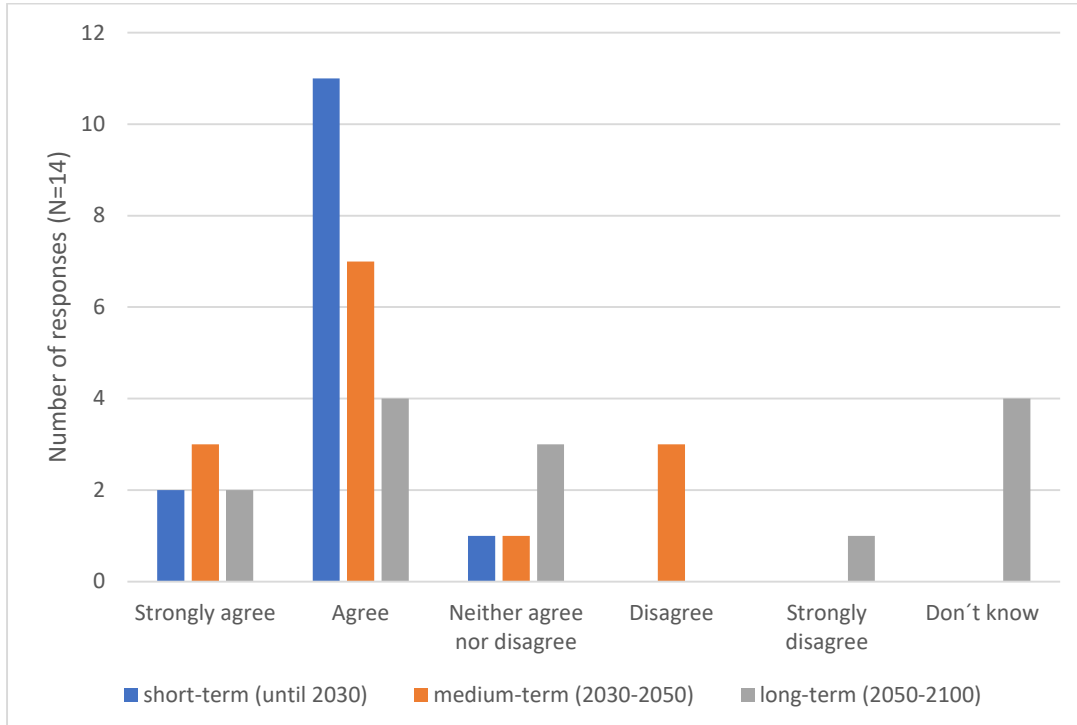


Figure 2 Stakeholder views (Focus groups 1 and 2) on whether policy efforts to increase biodiversity in forests while also transitioning towards a sustainable bioeconomy are associated with significant trade-offs on biodiversity and bioeconomy

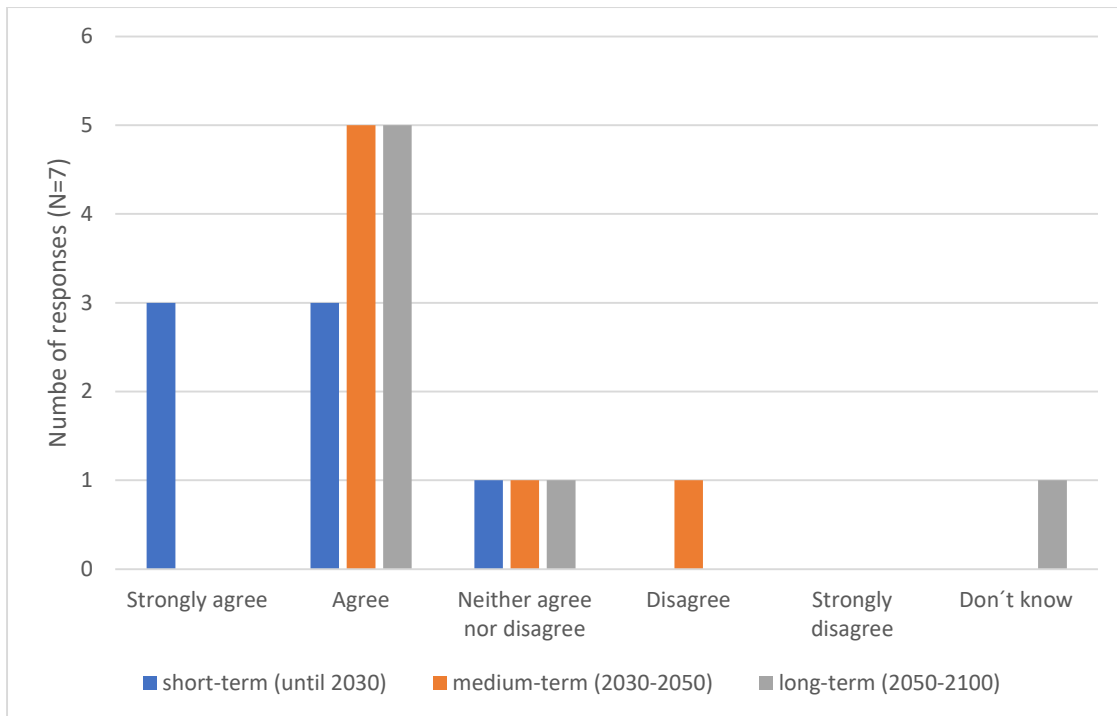


Figure 3 Results of stakeholder voting (Focus group 1) on wood use: “Will policy developments and the increased demand for natural raw materials lead to competition for use between **material** and **energy use of wood** in the value chain?”

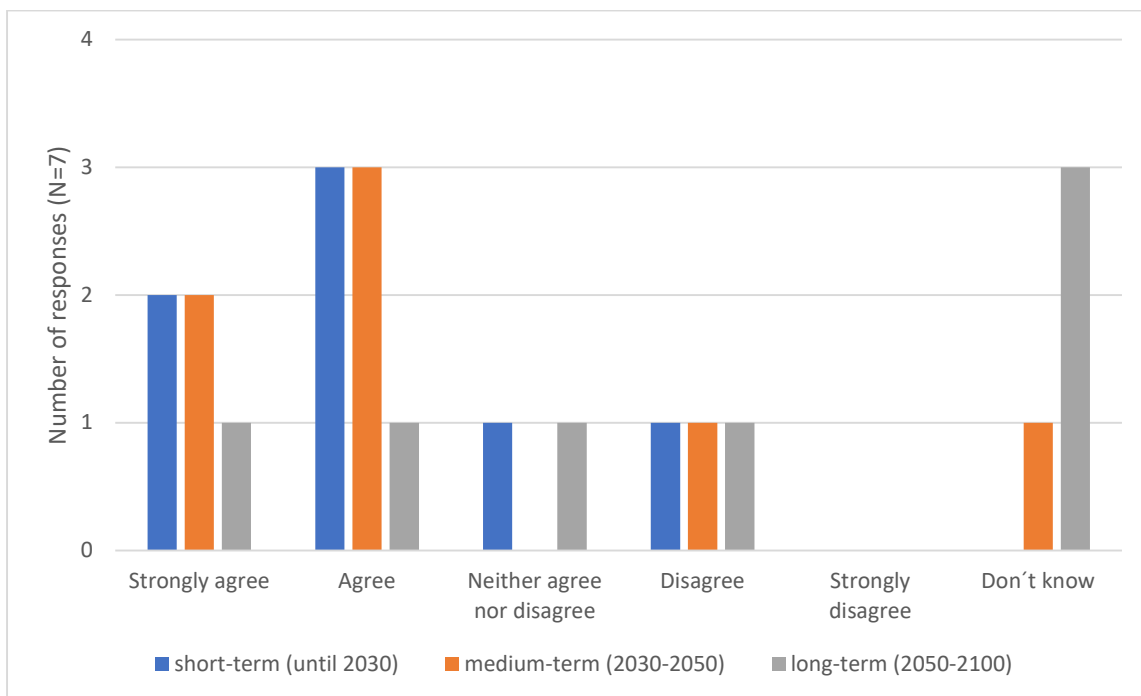


Figure 4 Stakeholder views (Focus group 2) whether increasing societal demands (e.g. recreational activities) on forests lead to competition between interests and uses of forests.



Summary of the main results: The severity of trade-off perception decreases overall over time for all questions. At the same time, higher uncertainties, connected with long-term planning horizon become visible.

The participants agreed that policies promoting collaboration and cooperation among forest-based enterprises would be very relevant.

3.3 Four main resilience related policy strategies

This sub-section will outline the four main resilience related policy strategies, identified along the lines of their resilience related goals (Table 2, above).

3.3.1 European Green Deal -communication and roadmap

The European Green Deal has started as an integral part of the European Commission (EC) strategy to implement the UN 2030 Agenda⁷ and its SDGs, especially of No.13 on pursuing climate action. It operates in response to environmental and socio-economic challenges (Fayer et al. 2022, Hermoso et al. 2022). The European Green Deal aims to make Europe the first climate-neutral bloc in the world by 2050 (EC, 11 Dec 2019; Ringel et al., 2021). The European Green Deal mentions the terms sustainability and also resilience several times (EC 2019b). Resilience is mentioned in line with restoration efforts. This is mainly expressed with a strong commitment to legally binding restoration of degraded habitats, the services they provide and the biodiversity they hold. It provides financial support over the next decade for restoring ecosystems (EC 2019b). With this it is expected to provide new benefits and opportunities, but will bring in socio-economic challenges to some regions, sectors, and groups of people (EC, 8 June 2021), coined by some authors as “leaving some behind” (Menton et al. 2020). However though, several other mechanisms and strategies, like the Just Transition Mechanism (JTM) have been introduced to accompany the European Green Deal *to ensure that the transition to a climate-neutral economy happens in a fair way, leaving no one behind* (EC, 14 Jan 2020b).

According to the Green Deals restoration/resilience and climate related policy goals, Europe is to become the first climate-neutral continent by 2050. To this end, the EC presented its Communication with the Impact Assessment on new climate targets on 17 September 2020 (European Commission, 2020). In its conclusions of 11 December 2020 (European Council, 2020), the European Council agreed on the target of reducing greenhouse gas emissions (GHG emissions) by 2030 by at least 55% net compared to 1990 levels, which was also legally enshrined in the EU Climate Change Act (European Union, 2021) in June 2021. To achieve and operationalise this target, the European Commission presented the first part of the "Fit for 55 Package" in its Communication (European Commission, 2021a) on 14 July 2021 and the second part on December, 15th, 2021. This Package ranks amongst the core element for the implementation of the European Green Deal (European Commission, 2019b).

⁷ The United Nation's (UN) 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs) (UN, 2015) put forward the imperative to “leave no one behind” and “reach the furthest behind first” (UNSDG 2019: 7). This policy recognizes the need to “combat poverty, end discrimination and exclusion, and reduce the inequalities and vulnerabilities” (UNSDG 2019: 6). The UNDP (2018) urges to realize the Agenda for Sustainable Development and do it by drawing on mutually reinforcing “levers”



3.1.2 EU Biodiversity Strategy for 2030 and associated action plan

Related to resilience and also employing the term of resilience, the **EU Biodiversity Strategy 2030** (COM (2020) 380) is one of the initiatives within the Green Deal, including binding restoration targets. It aligns with the Green Deal objectives and aims to bring “nature back into our lives” (EC 2020a). It wants to put Europe's biodiversity on a path to recovery by 2030.. The Biodiversity Strategy for 2030 revolves around three pillars: (i) protecting and restoring nature in the EU, by consolidating a coherent and effective network of PAs and restoring degraded habitats; (ii) enabling a new governance framework to ensure co-responsibility and co-ownership by all relevant actors in meeting the biodiversity commitments, including setting up new financial opportunities; and (iii) adopting a global biodiversity agenda, to strengthen the contribution of the EU towards halting global biodiversity loss and minimizing externalities of EU use of resources and consumption on other biodiversity-rich areas of the planet (EC, 2020a). Hermoso et al. (2022) argued that there are significant deficiencies in its implementation and it will be critical to find sustainable solutions to potential conflicts between conservation goals and other socio-economic objectives in order to resolve inconsistencies across sectoral policies (ibidem.p.265).

3.1.3 The EU Bioeconomy Strategy

For covering the forest-based value chain, resilience-related issues in the wood-working and forest-based sectors have been addressed by the updated **Bioeconomy Strategy** (European Union 2018) and an action plan to develop a sustainable and circular bioeconomy across the EU (EC, 2018e, EC, 2018a). The Bioeconomy Strategy aims to accelerate the deployment of a sustainable European bioeconomy. It contributes to the European Green Deal as well as to EU industrial, circular economy and clean energy innovation strategies.

In sum, the Bioeconomy Strategy aims to improve and scale up the use of renewable resources. The Commission has recently also adopted the new circular economy action plan in 2020 (EC, 2020b) as one of the main building blocks of the European Green Deal. With this, the European woodworking industries, have an important role in the development of a sustainable circular bioeconomy and the use of wood as a strategic resource, e.g. for so-called “green growth” (EC 2018). In terms of resilience, according to Hetemäki et al. (2017), a bioeconomy must ensure sustainable nutrient use, through more efficient fertiliser use and nutrient recycling. It can also help soil carbon restoration e.g. by putting CO₂ back in the soil. Regenerative agricultural practices can reduce atmospheric CO₂, while also boosting soil productivity and increasing resilience to floods and drought (ibidem.p.14).

3.1.4 EU Forest Strategy for 2030

Building on sustainable forest management (SFM), the **post-2020 EU Forest Strategy** is expected to cover the whole forest life cycle and is likely to have effective afforestation, forest preservation and restoration as its key objectives. The new Strategy sets out objectives to help increase the absorption of CO₂, reduce the incidence of forest fires, contribute to biodiversity conservation and enhance climate change adaptation and resilience (Aggestam and Giurca 2021). EU policy instruments that are relevant to forest-based industries demonstrate, on the one hand, that there are long standing efforts to address forest-relevant issues in the EU. Today, these frameworks set ambitious objectives and targets that include the decarbonisation of the building sector, maximising the potential of carbon storage in



forests, compensating for land use and forestry sector emissions by CO₂ removals, financing measures that support SFM, as well as halting the loss of biodiversity and the sustainable provisioning of ecosystem services. On the other hand, the wide range of policy domains (e.g., trade, agriculture and energy) also highlights that the forest-based sector is set against a complex backdrop of different sectoral perspectives, policy goals and implementation tools. According to Hetemäki et al. (2017, p.20f) Climate Smart Forestry (CSF) is also useful for resilient bioeconomy considerations. CSF is based on a wider approach than just storing carbon in the forest ecosystem. It considers the sustainable climate mitigation potential of the whole forest and wood product chain, including material and energy substitution and accounting for local circumstances. It not only aims towards climate mitigation, but also concentrates on its essential precondition of forest health and resilience, and the need for the adaptation of forests to climate change.

3.2 Key policy documents

This sub-section presents the most [relevant](#) policy documents [for resilience and related to forest-based value chains](#) under the main policy domains (Table 6, below) It presents the policy documents that were identified in accordance with the selection criteria (Table 1, leaning on Hurtado et al. 2022, p.6) as relevant for the policy goal of strengthening resilient forest value chains.



Table 6. Selected Key Policy documents (regulatory instruments) relevant for resilience and related to forest-based value chains

Main Policy Domains	Key Documents
Agriculture	<ul style="list-style-type: none"> • Rural Development Funds, the financial funds for rural areas (e.g. Regulation 1303/2013, 1305/2013 and 1306/2013; it is estimated that around 30% of the rural development budget go into forestry-related measures: afforestation, forest monument and agroforestry. • CAP (former) Pillar II monetary instruments for afforestation and forest protection measures, wildfire and natural hazard protection; • CAP (former) Pillar I for sustainable agriculture
Forestry	<ul style="list-style-type: none"> • 1998 Forest Strategy (COM(1998) 649; New Forest Strategy (COM/2021/572 final) • Council Resolution 1999/C 56/01); • Forest Action Plan 2007-2011 (COM(2006) 302); • Staff working document: A new EU Forest Strategy: for forests and the forest-based sector (SWD(2013) 342); • A blueprint for the EU forest-based industries (SWD(2013) 343); • EU Forest Communication Strategy; • Green Paper on Forest Protection and Information (COM(2010) 66); Plant Health (e.g., Directive 2000/29/EC); • REDD+ and FLEGT (Regulation 2173/2005); • EU Timber Regulation (Regulation (EU) No 995/2010 (to be repealed by the regulation on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation)
Environment	<ul style="list-style-type: none"> • 7th EU Environment Action Programme (Decision 1386/2013/EU); • Natura 2000 (e.g., Directive 2009/147/EC and Council Directive 92/43/EEC); • LIFE+ (Regulation 1293/2013); • 2020 Biodiversity Strategy (COM(2011) 244); • Convention on Biological Diversity and the Aichi targets; • United Nations Convention to Combat Desertification; • EU Water Framework Directive (Directive 2000/60/EC)
Climate	<ul style="list-style-type: none"> • EU Strategy on Adaptation to Climate Change (COM(2013)216) ; • LULUCF- Land Use, Land-Use Change and Forestry (LULUCF) (Decision No 529/2013/E); amended in REGULATION (EU) 2018/1999, currently converted into AFOLU. • EC 2021a. Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change. <i>COM(2021) 82 final</i>. Brussels: European Commission; • Fit for 55 the European Union plan to reduce greenhouse gas emissions by 55% by 2030
Energy	<ul style="list-style-type: none"> • EU Climate and Energy Package (e.g., COM(2010) 265) Kyoto Protocol; • EU renewable energy Directive 2009/28/EC, latest revision in 2021 (COM/2021/557 final) with an increased 40% target as part of the package to deliver on the European Green Deal; • Communication on the REPowerEU plan(COM/2022/230 final), to further increase this target to 45% by 2030 • REDD III (March 2023)
Timber, trade and industry measures	<ul style="list-style-type: none"> • A Stronger European Industry for Growth and Economic Recovery (COM(2012) 582); • Integrated Industrial Policy for the Globalisation Era (COM (2010) 614); • Bioeconomy Strategy (COM(2018) 60); • Resource Efficiency Roadmap (COM(2011) 571); • EUROPE 2020 -A strategy for smart, sustainable and inclusive growth (COM(2010) 2020); • Common Taxonomy Regulation (EU 2019/2022); • New Industrial Strategy for Europe (EC, 2020d)



Research and Development	<ul style="list-style-type: none"> • A number of research institutes and universities focus on forestry and forest-related topics, governments and industry invest in research and development to promote sustainable forest management, one funding program is the • Horizon Europe Funds for Research on Circular Economy and Bioeconomy Sectors for resilient forest value chains, e.g.: Clustering, Development Cooperation, Economic Cooperation, Research & Innovation, Technology Transfer & Exchange, Climate, Climate Change, Environment & Biodiversity, Circular Economy, Sustainability, Natural Resources, Agriculture & Forestry, Fishery, Food, Consumer Protection, Capacity Building, Cooperation Networks, Institutional Cooperation
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4. Policies at national and regional levels

To complement the mapping and analysis of most relevant EU-policies related to resilience in forest-based value chains with national or regional policies, a series of regional case examples have been selected for this report. Their selection took place due to the criteria of mapping the European Landscape with one Northern European Country (Finland), one Central European Country (Austria) and one Southern European Country (Portugal) as well as two regions. To cover Europe’s geographic diversity, the same countries have been selected for the RESONATE Resilience Dashboard (D 1.5, Resilience Dashboard, Demonstrator, Ludvig et al. 2023b). A summary of most relevant policy developments relating to resilience along the forest –based value chain is showcased. As EU regulations are legally binding for all member states and directives need to be translated in national laws, in line with the underlying directives, the case studies focus primarily on the complementation of the resilient-relevant policy ambitions in the countries and regions respectively. The policy landscape in all three European regions (Central, Southern, and Northern Europe) includes a range of policies and initiatives that are relevant to resilience in the forest-based sector, including sustainable forest management, forest landscape restoration, climate change adaptation, responsible sourcing, and green public procurement. However, the implementation and effectiveness of these policies may vary across different countries and regions due to at least five factors: Diversification of Forest Ownership, uptake of forest certification, extent of forest landscape restoration, regional specific measures for climate change adaptation, green public procurement as a societal demand, as outlined below:

- a) Forest ownership: In Northern, Southern and Central Europe, a larger proportion of forests are privately owned. In Eastern Europe, a larger proportion of forest are privately owned.
- b) Forest certification: The uptake of forest certification schemes also varies across the regions. In Northern Europe, there is a high level of certification, with around 70% of forests certified by the FSC or PEFC. In contrast, certification rates are lower in Central and Southern Europe.
- c) Forest landscape restoration: The extent to which policies and programs to promote forest landscape restoration are being implemented also varies between regions. In Northern Europe, some countries have relatively high levels of forest cover in contrast to the Southern European countries.
- d) Climate change adaptation: While all regions have policies and strategies to promote adaptation to the impacts of climate change on forests, there may be differences in the specific measures being implemented. For example, in Northern Europe, measures may focus on reducing the risk of wind throw, while in Southern Europe, measures may focus on reducing the impacts of drought and wildfires.
- e) Green public procurement: The level of uptake of green public procurement policies also varies between regions. In Northern Europe, there is a high level of public awareness and demand for sustainably sourced forest products, which has led to the adoption of green public procurement policies in many countries. In Southern and Central Europe, the adoption of such policies may be more limited.



4.1 Finland

The most relevant policies pertaining to resilience in Finland are the Finnish bioeconomy strategy, which has recently been updated for the timeframe 2022-2035⁸, Finland's recovery and resilience plan⁹, Strategy for the Conservation and Sustainable Use of Biodiversity¹⁰ and the accompanied biodiversity action plan¹¹. A new Biodiversity strategy is currently under development.

The new Finnish bioeconomy strategy aims towards a low-carbon and resource-efficient society and a sustainable economy by using the rich pool of renewable natural resources, high level of expertise and industrial strengths and to strengthen its forerunner role in sustainable bioeconomy realisation. Simultaneously, Finland aims at enhancing ecosystem resilience and the contribution of biodiversity to carbon stocks through conservation and restoration under their current biodiversity strategy. Finland's recovery and resilience plan seeks to foster sustainable economic growth and create jobs while aiding with the "green transition" and help building economic and social resilience.

Finland has a strong focus on developing a value-added forest-based bioeconomy.

4.2 Austria

Austria has not yet a national biodiversity strategy, but since March 2019 Austria does have a Bioeconomy Strategy.¹² The strategy mentioned the acceleration of timber mobilisation from local forests as well as the necessary improvement of forest resilience. As bioeconomy being understood as an economical concept, strong focus is being put on the sustainable management of natural resources and forest-based processing industries. The Austrian Bioeconomy Strategy puts a sustainable economy first and does not mention of resilience. Nevertheless, efforts towards resilience could be considered implicit – as a sustainable bioeconomy aims at environmental, economic and finally social resilience – and the strong focus on economy might be explained by the high economic relevance of wood-based value chains and processing industry in Austria. The Austrian bioeconomy strategy includes a broad range of sectors beyond the forest-based bioeconomy, such as agriculture, food, and waste management, as outlined in the different policy domains in figure 1 of this report.

4.3 Portugal

Since the Covid-19 Pandemic, Portugal has set a focus on the overall social, economic and environmental resilience, by founding the national Recovery and Resilience Facility, with measures targeting forest and water management together with culture, housing, health, broad social responses in a holistic approach. Portugal is set to receive €16.6 billion in both nonrepayable support and loans from the Recovery and Resilience Facility (RRF), the

⁸ See: https://julkaisut.valtioneuvosto.fi/bitstream/handle/10024/163969/VN_2022_5.pdf?sequence=4&isAllowed=y

⁹ See: https://ec.europa.eu/info/business-economy-euro/recovery-coronavirus/recovery-and-resilience-facility/finlands-recovery-and-resilience-plan_en

¹⁰ <https://julkaisut.valtioneuvosto.fi/handle/10024/162392>

¹¹ See: <https://ym.fi/en/national-biodiversity-policy#:~:text=The%20main%20objective%20of%20the,and%20cultural%20values%20of%20biodiversity.>

¹² See: <https://www.bmbwf.gv.at/en/Topics/Research/Research-in-Austria/Strategic-focus-and-advisory-bodies/Strategies/Bioeconomy-Strategy.html>



unprecedented EU response to the crisis triggered by the Covid 19 pandemic. This amount corresponds to 2.3 % of the entire RRF, and to 7.8 % of Portugal's 2019 gross domestic product (GDP). For the topic of biodiversity and bioeconomy, the following measures relating to climate transition have been developed: key actions on industry decarbonisation and energy efficiency of buildings. These reach 38 % of the allocation. The focus area of the Portuguese National Recovery and Resilience Plan (NRRP) amounts to just over 22 % of the allocation, with measures and reforms aimed at public administration and finances, education, and businesses, including businesses pertaining to the forest sector.¹³

Portugal has also a Bioeconomy strategy Roadmap¹⁴ and is linking its efforts very explicitly to the CAP (see Figure 1), in terms of bioeconomy, it has more general goals, such as promoting sustainable growth and job creation.

4.4 Regional Case I: Catalonia in Spain

Catalonia is a partly Mediterranean region with good potential for adaptation and resilience to small disturbances. The features of natural resources, agriculture-livestock, recycling, industry and energy sectors –as well as the Involvement of the private sector- allow relevant potential for bioeconomy implementation. That is the reason why the Catalan Government has identified the implementation of the bioeconomy as a main priority for the current period. Barcelona is one of the few cities in Southern Europe with full-modal transport integration. International port and airport, high-speed railway and motorways within a 12-kilometre radius, each with global connectivity. Over 200 ha of public industrial land and more than 800 ha of public logistics land are available and represent the better premises for future development.¹⁵

Furthermore, as part of the “Four Motors for Europe”¹⁶ – a network of European regions actively contributes to European affairs especially by issuing common positions on EU policy initiatives - the Government of Catalonia published a programme to “Strengthen the transformative resilience of our societies” during its presidency. The programme covers social, environmental and economic resilience, to guarantee a fair transition to a sustainable economy that leaves no one behind, and, at the same time, ensures a positioning of regions for dealing with any future global crises.¹⁷

4.5. Regional Case II: Galicia in cross-border region between Portugal and Spain

Galicia is one of the RESONATE cases and it spans across both Spain and Portugal. In contrast to Catalonia, Galicia has more coniferous forest cover, with pine and eucalyptus plantations covering approximately 60% of the forested area. The forest industry in Galicia is dominated by the pulp and paper sector, which accounts for about 90% of the region's forest product exports. Accordingly, the wood value chain in Galicia is to a considerate extent focused on supplying raw materials to the pulp and paper industry. For a better understanding, Catalonia has a more diverse forest cover, with both deciduous and coniferous forests. Hence, it can be said that the forest industry in Catalonia is more diverse. This entails a with a mix of sawmilling, paper production, furniture manufacturing, and biomass energy production. More than in Galicia, the wood value chain in Catalonia has a focus on processing and value-adding activities. It also has some greater emphasis on the production of high-value products such

¹³ [https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/729408/EPRS_BRI\(2022\)729408_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2022/729408/EPRS_BRI(2022)729408_EN.pdf)

¹⁴ https://scar-europe.org/images/CASA/Events/Portugal_20may2019/presentations/Claudia_Costa.pdf

¹⁵ <https://www.bioeconomy-regions.eu/membership/members/member/catalonia-0>

¹⁶ <https://www.4motors.eu/>

¹⁷ https://www.4motors.eu/fileadmin/_4motors/Dokumente/Presidencies/CAT_2020-2021.pdf



as furniture and construction materials. The variation in forest resource availability reflects the differences in both value chains.

Regarding resilience, a recent study found out that the projected climate change impacts, such as increased temperatures and decreased precipitation, could lead to significant changes in the forest structure and species composition in Galicia (Gorriz-Mifsud et al. 2022). For policy coherence, the Spanish and Galician Bioeconomy Strategies are all calling for coordination between both the Agricultural and the forest-related sector, such pleas could be found in a number of related documents (see as well Gorriz-Mifsud et al. 2022).

5. Discussion and Conclusions

The results obtained on the distinct policy domains connected to the forest-based value chain (figure 1, table 3) reveal that not all of the related documents are primarily forest-focused. Two of the main resilience-related EU policy strategies outlined above address restoration in combination with resilience: The Biodiversity Strategy for 2030 and the European Green Deal. They refer explicitly to resilient forest ecosystems, e.g. with afforestation goals and the goal of restoration of Europe's forests.

When comparing the results on the EU policy frameworks (section 3) and the national policy frameworks (section 4), many similarities in terms of content of the targets in the texts of the biodiversity and bioeconomy goals can be found. The national biodiversity strategies are also in line with the EU Biodiversity Strategy to halt global biodiversity loss and restoring degraded habitats. All of the national bioeconomy strategies analysed in this report are addressing climate-related targets such as carbon efficiency and the use of renewable resources, just like the EU Bioeconomy Strategy. The results on regional policies (sections 4.4. and 4.5.) showcase how the regional contextual circumstances influence resilience needs: the variation in forest resources, tree species and related value chains influence the specific foci for policies, e.g. in strengthening the value chain for economic stability and job creation whilst maintaining biodiversity and combating disturbances such as wildfires.

For all policy-levels, that is the EU, national and local levels, there are manifold demands towards forestry, which we have identified as directly or indirectly targeting the strengthening of resilience: Forest management related demands require natural forest management for harvesting, adaptive forest management and the increase of carbon sequestration in forests. Policy demands under the attribute of "nature-based solutions"¹⁸ target restoration, afforestation and agro-forestry. Further demands are the avoidance of deforestation, land use change and vice versa the conservation of forests and the conservation and increase of protected forest areas. As outlined in the results on key policy documents (Table 4), these demands are mirrored in an increasing number of documents at the EU level. However, the principal strategic goals of the Bioeconomy Strategy and the Biodiversity strategy are not always congruent. Whilst the Bioeconomy Strategy targets enhancement of a Circular Bioeconomy for replacement of fossil fuels, the Biodiversity Strategy strives for strict protection of forests for biodiversity enhancement (Ludvig et al. 2023a, Del. 1.3). Such potential incongruences were discussed in the RESONATE stakeholder focus groups (see section 3.2 of this report). The two debates about the economic and the ecological role of forests for resilience revealed that stakeholders saw a necessity for the two perspectives in having better

¹⁸ https://research-and-innovation.ec.europa.eu/research-area/environment/nature-based-solutions/research-policy_en (Last access 2023-05-22)



communication across the different policy domains (Hogl et al. 2016). The discussions in the stakeholder workshop further revealed the importance to also promote the fact that forest management will be needed for biodiversity conservation and environmental concerns; also carbon storage on the longer run (time boundaries of more than 60 years) will need active forest management. This might go contrary to the policy pleads of 10-30 % protection of forests (10% without forest management), outlined in the biodiversity strategy. Yet, it is probable that the implementation of the EU biodiversity strategy will have different effects on national and international timber markets due to the different forest resources of the individual EU member states (Dieter et al. 2020).

The discussions on trade-offs in the stakeholder workshop also hinted to the mirroring of such opposing viewpoints (environmental protection and forest management operations) in the general EU public: Some of the studies on the perception of the EU general public show that media reflect to a greater extent on “environmental protection” when the notion of “forests” is used, rather than the sustainable products that forests provide (Ranacher et al. 2019). Another study dealing with survey results amongst citizens shows that these tend to regard forests in terms of environmental services, as locations for biodiversity and recreational opportunities (Ranacher et al. 2020). However, Ranacher et al. (2020) also indicated that the potential role of the forest bioeconomy in climate mitigation is not well understood by the public.

Furthermore, there needs to be more consideration of global and local (societal) effects from the ways forest products are being produced and processed. Increased protection can have indirect–global and societal-effects when not taking into account measures for active forest management. Such are (i) increased import of timber and raw material from other countries outside the EU, leading (ii) possibly to damage of the natural environment there (Dieter et al. 2020). In other words: incongruences in policies can lead to further environmental damage due to wood imports from possibly non-certified sources. Thus, on a global level, decreased production and consumption of wood-based products could lead to a growing use of non-bio-based resources to substitute wood-products. But the magnitude of effects strongly depends on how much the use of forest resources is actually restricted by policies (Schier et al. 2022).

Finally, other parts of the value chain, which are located outside of the biological resource of forests, e.g. long-living Harvested Wood Products (HWPs in the Kyoto Protocol) (Sarthre et al. 2010), are hardly included in the policy strategies. For increasing resilience (as framed in Hurtado et al. 2022, p.6), a more holistic view would include the entire forest-based value chain. In other words, policies need to consider the effects of measures targeting the forest resource on the following segments of the value chain. These parts include production and eco-system services as well as effects on biodiversity at the global level (Deiter et al. 2020, Schier et al.2022).



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Annex 1: Key Interviews Conducted

Table i: Key Interviews conducted (Participation was based on anonymity):

Number of interview transcript	Interview Partner, month and type	Duration of Interview
Interview No. I	EU Expert on Policy Development, April 2022, ZOOM	45 minutes
Interview No. II	European Forest Institute, Expert on Bioregions, May 2022, Vienna	1 hour
Interview No. III	Evaluator of Resilience Predictors, EU Member state level, May 2022, ZOOM	40 minutes
Interview No. IV	Forest Policy and Value-chain Expert (Austrian Ministry of Agriculture), May 2022, Vienna	1,5 hours