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**“Forest Policy Integration in Europe:
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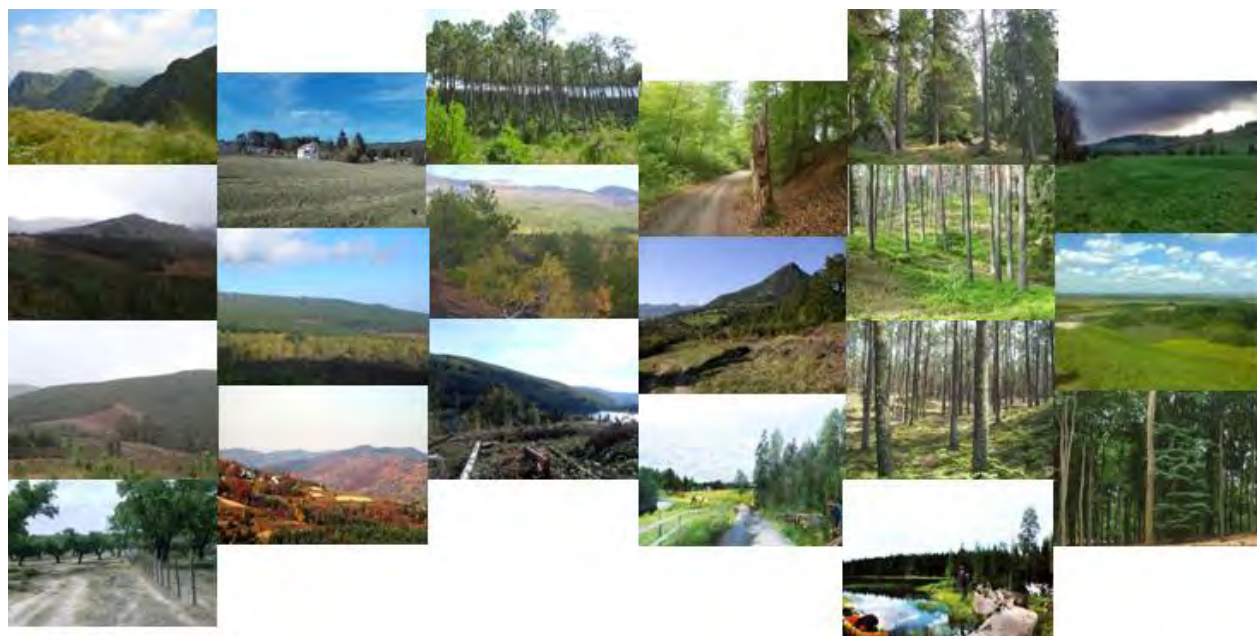
INTEGRAL EU Policy Paper

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Executive Summary

Sustainable forest management (SFM) has been broadly established as a policy objective in European and national forest policy and laws. However, for forest policy-makers, owners, managers, and stakeholder groups across Europe, one key challenge for implementing SFM in practice remains the **integration of different forest-related policy objectives and societal demands** within the context of an uncertain and complex future. Hence, there is a need to identify and to implement policy and management responses that can help integrate different demands and objectives and anticipate and prepare for what the future has in store.

Within **INTEGRAL**, 20 landscape level case studies in 10 EU countries, cross-case comparative analyses, EU level syntheses and studies were conducted in an inter- and transdisciplinary way using qualitative foresight methods, forest modelling, footprint analysis and other methods to address these challenges and related opportunities. The landscape level was chosen for the case studies because that is the level where the diverse forest ecosystem goods and services are provided and the different demands and policies must be balanced.

While the increased flexibility that comes with the **reformed EU rural development policy** may allow Member States to address the heterogeneity of forest regions across Europe, the funding for forestry-related measures are now increasingly dependent on Member States priorities – for better and worse – in the coming years. The absence of a coherent and consistent **EU regulatory framework for forests** rather increases the potential risks that come along with an increased flexibility for EU Member States.

Some important EU forest-related policy instruments that could help to improve coordination and achieve forest policy goals already exist but are underutilized or poorly implemented – these include the **EU Water Framework Directive or Natura2000**. For instance, in the case of the Water Framework Directive, it only notes forests once – as a potential pressure on water – even though forests play a central role in ensuring water quality and protection. This demonstrates the absence of a voice for forests and how associated sectors (e.g. energy, water and climate) could improve coordination at the EU level.

In other cases, such as the **EU Bioeconomy Strategy**, critical strategic direction is being given without full consideration of the potential conflicts with existing forest-related policies, conflicts that could put forests at risk. It is nonetheless clear that the forest sector can become a key player in realising the EU Bioeconomy Strategy. Forests and forest management will be particularly important in the development of rural economies, employment, energy security, climate change mitigation and the environment through the substitution of non-renewable resources and securing a sustainable economic development for the future.

In yet other cases, policy development at the EU level is urgently needed to realize the actual potential of forests, for example for **Non-Wood Forest Products (NWFP), tourism and urban forests**. These ecosystem services are expected to increase, and could help guarantee ecological (and human) health and keep up profitable wood production.

We conclude by presenting several principles and steps needed for taking an **integrated approach towards forest policy and management**. After assessing the current state of forest policy integration as well as identifying and evaluating key factors that drive the lack of integration, ways and means to improve coherence and strengthen coordination are suggested. The previous, incoherent policy and management framework should be supplemented or replaced by this integrated approach. For its development, participatory decision-making processes on the sub-national (landscape) level connected to the national and European levels, conflict management procedures and systematic monitoring of implementation are recommended.



1. Introduction

Decision-makers, managers and stakeholders across Europe have to **address issues of challenging policy coordination and trade-offs** in order to meet competing demands for a variety of forest ecosystem goods and services in the context of an uncertain and complex future. There is a need to identify and to implement a variety of policy and management responses that can help anticipate and prepare for what the future has in store. Therefore, addressing policy coordination issues and integrating different societal demands in a balanced approach to forest management for both current and future generations in Europe remains a key objective for implementing Sustainable Forest Management.

Sustainable forest management (SFM) has been broadly established as a policy objective in European and national forest policy and laws. The concept is today regarded as a significant management principle in forestry and as a core aspect of forest sciences throughout Europe (Glück 1994). SFM refers to a vision where people use and protect forest ecosystems in accordance with the principles of sustainable development (Rayner et al. 2010). In particular, forest management should provide various forest ecosystem goods and services (e.g. timber, biodiversity conservation, recreation, soil and water protection, climate regulation), now and in the future. The main idea is to balance different societal interests through multifunctional forestry. This illustrates that SFM can be described as (i) a normative demand to satisfy diverse societal interests through multiple forest use; and (ii) a future-oriented ethical claim for inter-generational equity (Sotirov et al. 2013, 2014a/b).

Hence, one key challenge of implementing SFM in practice concerns the **integration of different forest-related policy objectives and societal demands**. This is especially relevant at the **landscape level**, where the provision of diverse forest ecosystem goods and services must be balanced against the challenges arising from incoherent policy demands (e.g. agriculture, nature conservation and energy), competing societal demands (e.g. timber production and recreation), market forces (e.g. wood for energy and timber for other end uses) and environmental processes (e.g. climate change and biodiversity loss). In the present situation, with increasing demands and competition for different forest land uses, more efficient, environmentally sound and integrated ways to manage forest resources are needed.

Forests are characterised by **long life cycles, complex ecosystem structures, functions and interactions**. They are affected by environmental factors (e.g. climate change-induced droughts, floods and fires, outbreaks of pests and diseases) and human-induced activities (e.g. timber felling, afforestation and forest road building). Interactions with other land uses (e.g. agriculture, water management, hunting, recreation, infrastructural development) put further strain on SFM. The complexity and long duration of ecological processes in forests are **amplified by general developments** in societies (e.g. urbanization, aging populations and migration), changing economies (e.g. industrial growth, decline and financial crises), technological developments and innovations (e.g. new products and technologies) and policy-making (e.g. changes in policies, laws and political systems). Though identified in outline, future conditions and developments remain mostly uncertain in detail. Especially given the progressively changing climate and increasing demands for natural resources, the past does not provide evidence concerning what may lie ahead. Extrapolation does not always work either.

This policy paper puts its main emphasis on **future-oriented and integrated management of forests** at the landscape level and relates it to the EU policy level. It summarises the academic and practical experience with challenges and opportunities relating to integrative forest policy and management approaches throughout Europe gained within the INTEGRAL research project. It also provides key messages, suggestions and recommendations addressing the question of how to support the implementation of SFM, multifunctional forestry as well as how to improve policy coordination.



2. Methodology

INTEGRAL was carried out in three interconnected **research phases** and at two **levels**. The first phase consisted of a diagnostic analysis of key socio-ecological drivers and barriers of integrated forest management. The second phase included explorative development and participatory evaluation of future scenarios of forest management. The third phase identified roadmaps consisting of policy measures and forest management strategies that can help achieve desired, and avoid undesired, baskets of forest ecosystem goods and services in the future. The first level of analysis consisted of case study research in 20 forest landscapes in ten European countries¹. The case studies represent distinct EU regions with diverse ecological, socio-economic, political and cultural circumstances. The case study research was complemented by cross-case comparative analyses, EU level syntheses, and EU and global level studies on drivers of SFM, forest footprints and legality verification; this constituted the second level of analysis.

The INTEGRAL inter- and trans-disciplinary research drew on academic expertise and methods from the social and natural sciences. A policy and socioeconomic research analysing more than **400 expert interviews** (e.g. decision-makers, forest owners, forest managers and stakeholders) and **hundreds of documents** (e.g. legislation, policy papers, reports, statistics) was carried out. This qualitative research strand was coupled with quantitative work using forest ecology and management assessments, forest growth modelling, and forest decision support systems to analyse **ecological, bio-geological and technical aspects**. In the second phase, dozens of participatory **scenario development workshops** were carried out in all 20 case studies, involving over 350 decision-makers, practitioners, stakeholders and scientists in the ten EU countries. The workshops applied qualitative foresight methods and forest modelling, and resulted in **80 future scenarios for forest management** in Europe. This work addressed two questions: what forest-related future scenarios ('forest futures') might unfold during the next 25-30 years, and, what might be their impacts as regards ecological, socio-economic, and policy aspects? In the third and final phase, participatory **policy back-casting** together with forest modelling were carried out. Involving **hundreds of experts** through a series of **trans-disciplinary workshops, policy instruments, robust strategies and forest management approaches** were identified that can help provide desired forest ecosystem goods and services.



AN INTEGRAL WORKSHOP WITH STAKEHOLDERS IN GERMANY, SOUTH OF MUNICH.

Photo: A. Selter

¹ Case study countries included Bulgaria, France, Germany, Ireland, Italy, Lithuania, Portugal, the Netherlands, Slovakia, and Sweden.



The findings and assessments presented in the present policy paper are based on **INTEGRAL synthesis reports** (Rodriguez-Aseretto et al. 2013, Borges et al. 2014, Hinterseer et al. 2014, Sotirov et al. 2014a), **policy briefs** (Sotirov et al. 2013, Sotirov et al. 2014b) and **regional case study reports** (Bonsu et al., 2013; Sergent et al., 2013; Pettenella et al., 2013). Comments by various interest groups and scientists on an earlier draft of this paper and working group discussions at the INTEGRAL EU final conference, held in Brussels on 24-25th June 2015, were also incorporated into this policy paper. This should enhance the policy relevance as well as the reliability and validity of the main findings. To make the policy report more reader friendly and to assure ethical aspects of trans-disciplinary interactions, the particular sources of information are not specifically referred to throughout the text².

3. From forest-related policies at the EU level to forest management at the landscape level: key findings and assessments

On the EU level, a clear reference to forests and forestry has not been given in the founding treaties. However, efforts have been made to improve coordination and cooperation on forest-relevant issues in the EU. In line with this effort, a non-legally binding EU forest strategy was adopted in 1998 (EC, 1998; CEU, 1999), followed by a Forest Action Plan (EC, 2006). Both EU documents were based on subsidiarity and shared responsibility between the EU and its Member States. Together, the Strategy and Action Plan were supposed to provide an integrated policy framework for forest action. However, to date they have not resulted in any greater coherency in EU forest-related policies – principally because they have not had an impact on policy-making in other sectors (Pelli et al. 2012) and due to policy, institutional and socio-economic divides in the EU multi-level system of forest governance (Winkel and Sotirov 2015). As the previous Strategy and Action Plan finished in 2011, a new Forest Strategy was issued in 2013 (EC, 2013a) and has now been adopted by the European Parliament (EP, 2015). The new Strategy identifies key principles needed to strengthen SFM and improve competitiveness and job creation, particularly in rural areas, while ensuring forest protection and delivery of ecosystem services.

Hence, most EU actions having an impact on forest landscapes are primarily associated with other policy areas and forest issues are torn between different sectoral interests whenever new targets evolve outside the forest sector. The most commonly noted amongst these is the Rural Development Policy under the Common Agricultural Policy (CAP). Further policy domains specify forest-relevant targets such as halting biodiversity loss, reaching a 20% share of energy from renewable sources and reducing GHG emissions by 20% by 2020, increasing biomass energy from wood, and ensuring legal compliance for wood or forest products produced within and imported to the EU. Furthermore, targets have been set to halt global forest cover loss by 2030 and to reduce tropical deforestation by at least 50% by 2020. And, more recently, a new 2030 climate and energy policy framework was also adopted by the Council of the European Union in October 2014, with the headline target of reducing GHG emissions by 40% compared to 1990. It has also been decided that Land Use, Land-Use Change and Forestry (LULUCF) will be integrated into the 2030 GHG mitigation framework, meaning that these sectors should contribute to the reduction targets. Table 1 provides an overview of EU sectoral policies and instruments that are relevant for SFM. These EU policy domains often seek to influence future forest management at the landscape level in line with their sectoral perspectives. Undoubtedly, these policy settings will directly and indirectly impact on how forests are managed in years to come.

² More information about INTEGRAL case studies, methods, results and its final conference can be found on <http://www.integral-project.eu>.



The following sections present the main results from the INTEGRAL project according to the objectives and instruments of these relevant EU forest-related policy areas. Their aim is twofold: first, to **synthesize and contextualize the INTEGRAL results** in terms of recent developments in EU objectives within the forest-related policy framework (e.g. EU Directives, regulations, strategies and other recommendations), and second, to **link the INTEGRAL results to the different EU policy areas** discussing what impacts they may have on an integrated approach to forest landscape management.

Table 1: Overview of EU policies and instruments relevant to forests and forest management, in the order of their maturity

Policy Area	Policy Instruments		
	<i>Legally binding</i>	<i>Non-legally binding</i>	<i>Financial</i>
Rural development	<ul style="list-style-type: none"> • CAP Reform (2013) • EU Regulations on rural development for 2014-2020 	<ul style="list-style-type: none"> • Communication on sustainable food (2013) • European Innovation Partnership on Agricultural Productivity and Sustainability (2012) 	EAFRD, ERDF, ESF, EMFF
Nature Conservation	<ul style="list-style-type: none"> • Birds Directive (1979/ 2009) • Habitats Directive (1992) • NATURA 2000 case law 	<ul style="list-style-type: none"> • No Net Loss Initiative (2015) • Communication on Green Infrastructure and Restoration (2012) • EU Biodiversity Strategy 2020 (2011) • Natura 2000 and Forest Guidance Document (2015) 	LIFE Programme (2014-2020); EAFRD, ERDF, Horizon 2020
Protection of water and soils	<ul style="list-style-type: none"> • Water Framework Directive (2000) 	<ul style="list-style-type: none"> • Blueprint on water (2012) • Innovation partnership on water efficiency • Guidelines on best practice to limit, mitigate or compensate soil sealing (2011) • Soil Thematic Strategy (2012) 	LIFE Programme (2014-2020), Horizon 2020
Climate	<ul style="list-style-type: none"> • Emissions Trading Scheme Directive (2003/2014) • Effort Sharing Decision (2009) • LULUCF Regulation (2013) • A policy framework for climate and energy in the period from 2020 to 2030 (2014) 	<ul style="list-style-type: none"> • EU Strategy on adaptation to climate change (2013) • Communication on LULUCF in the EU climate change commitments (2011) • Low Carbon economy 2050 roadmap (2011) • Review of EU air quality policy (2013) • Revision of the legislation on monitoring and reporting of GHG (2011) • Thematic strategy on air pollution 	EAFRD, Cohesion Fund, Horizon 2020, LIFE Programme, Connecting Europe Facility
Bioenergy	<ul style="list-style-type: none"> • Renewable Energy Sources Directive (2009) • Proposal for a new Directive on advanced biofuels (2012) • Biofuels Directive (2003) • Energy Efficiency Directive (2012) • Directive on energy performance of buildings (2010) 	<ul style="list-style-type: none"> • A policy framework for climate and energy in the period from 2020 to 2030 (2014) • Energy 2020: A strategy for competitive, sustainable and secure energy (2011) • European Energy Efficiency Plan 2020 (2011) • Renewable Energy Road Map (2007) • EU Strategy for Biofuels (2006) • EU Biomass Action Plan (2005) 	EAFRD, Cohesion Fund, Horizon 2020, LIFE Programme, Connecting Europe Facility
Forest Governance / Timber Trade	<ul style="list-style-type: none"> • EU FLEGT Action Plan (2005) • EU Timber Regulation (2010) 	<ul style="list-style-type: none"> • FLEGT Voluntary Partnership Agreements (VPAs) • Voluntary third party certification / forest certification schemes 	
Bioeconomy and the circular economy	No legally binding instruments	<ul style="list-style-type: none"> • EU Bioeconomy Strategy and Action Plan (2012) • Action Plan towards a sustainable bio-based economy by 2020 (2011) 	Horizon 2020



3.1 EU rural development policy and sustainable forest landscape management

The EU Rural Development Policy (RDP) (2014-2020) under the Common Agricultural Policy (CAP) is an EU policy framework that is pivotal to the management of forest landscapes. The RDP objective is to increase the competitiveness of the EU agriculture sector, and to promote sustainable management of natural resources through rural development. It incorporates forestry measures and forestry-related activities including: prevention and restoration of damage to forests from fires and natural disasters; forest environmental and climate services and forest conservation; investments in forest area development and improvement of the viability of forests; afforestation and creation of woodland; establishment of agroforestry systems; production of wood for energy; investments in physical assets; advisory services; farm management and farm relief services.

The CAP itself was originally defined by the Treaty of Rome in 1957 and has since evolved into a significant instrument affecting forest management across Europe. It formulates rules and priorities for agriculture and rural areas, including forestry as one of the main forms of land use. The CAP has also been subject to several reforms, such as the CAP Health check in 2008. Since then, it has gradually moved away from product- to producer-based support, including the incorporation of environmental considerations. The most recent reform, as part of the new programming period covering 2014 to 2020, has focused on making the CAP more effective. Some novel features of the CAP 2014-2020 include the **joint provision of public and private goods** (e.g. payments for public ecosystem services), **increased flexibility** for Member States in implementing instruments available under Pillar 1 (e.g. reflecting the wide diversity of environmental and socio-economic conditions across Europe), and making the CAP more **effective and coherent** (e.g. reducing red tape for small-scale and young farmers). One change that is likely to affect European forest landscapes in particular is the introduction of a **Greening Payment** under Pillar 1. Green Direct Payments make up 30% of the funding available and relate to the provision of environmental public goods (e.g. sustainable farming and climate change mitigation). All national Rural Development Programmes (RDPs) under Pillar 2 will be obliged to spend 30% of their budget on measures that are beneficial to the environment and climate change targets. These measures are expected to have an impact on forest landscapes because they will affect forestry, areas of natural constraints (e.g., mountain forests) and Natura 2000 sites.

INTEGRAL results re-confirm the importance of EU rural development subsidies and reveal that afforestation subsidies significantly **affect forest landscape management choices** in several EU Member States. For instance, EU funds for the afforestation of farmland in Portugal played an important role because landowners have used them to renovate and expand cork oak forests. Irish forest owners have admitted that there would be no private forest sector in the country without EU financial support for afforestation. There are also variations within the EU Member States. The country studies from Italy show that regional rural development plans were fundamental in stimulating forest-based economic activities in the Veneto and Molise regions. In contrast, forest-relevant public expenditure on rural development in Sicily is characterised by policy goals targeted at the provision of public goods (e.g. nature conservation, water and soils protection). Significant land-use changes were also noted in Lithuania where forest areas have increased due to the afforestation of abandoned agricultural land. All these effects were attributed to EU subsidies.

Other effects of subsidies that relate to the impacts of EU bioenergy objectives on forestry (see also section 3.5 on bioenergy) have been observed. Subsidies for wood energy in France made **wood energy more profitable than the production of industrial wood** leading to both market competition and increasing timber use to meet demands. In the Netherlands, the combination of higher timber prices and a decrease in subsidies led to an increase in timber harvesting. This was also observed in other case studies. In France, Germany and Slovakia, it was indicated that the allowable cut and timber supply did not meet local demand in some areas, meaning that



the competition for wood resources between forest-based industries, such as energy, pulp and paper, sawmilling and panel production, has increased significantly. However, public subsidies also have impacts on ecological aspects of forest management. It was, for example, noted in some cases studies that rural development subsidies for road building and mechanization of timber logging were inconsistent with Natura 2000 contracts and ecological measures under the CAP (EAFRD financing). These findings illustrate the effects of **incoherent horizontal (cross-national and sectoral)** and **vertical (EU to Member State) policy goals** at the landscape level.

Table 2 further illustrates that the implementation of rural development policy varies significantly from one Member State to another. For instance, the trade-offs between forest-related policy goals (as indicated in Table 2) generate horizontal and vertical incoherence and fragmentation between sectoral and national interests that have important implications for forest management at the landscape level. The rather low uptake of forestry-related measures in the CAP 2007-2013 is striking. Member States only utilized 42% of the EU funds available for forestry-related measures. To illustrate, only 13% of the funding for forest-environment payments, measure 225, were used by national governments (Szedlak 2013). This is also the case for Natura 2000 payments where only 16% of the funding was used for measure 224 (ibid.). The main point here is that results from INTEGRAL reveals an **imbalance between EU policy goals and their implementation at the Member State level** through the uptake of forestry-related measures.

Table 2: Cross-case comparison of Rural Development Programme incoherencies in case studies (own depiction)

Case study	EU RDP Incoherencies	State of national forest policies
Bulgaria	<ul style="list-style-type: none"> Nature conservation goals conflict with forest management and timber production goals. 	<ul style="list-style-type: none"> Timber production remains dominant, despite inclusion of EU climate and nature conservation goals.
France	<ul style="list-style-type: none"> Wood mobilization goals are in conflict with both biodiversity goals and traditional forestry practices. 	<ul style="list-style-type: none"> EU climate and energy targets are pursued through wood mobilization, while maintaining SFM/multifunctional and environmental goals.
Germany	<ul style="list-style-type: none"> Cross-regional (federal government to federal states) variations in the implementation of biodiversity policy. Nature conservation goals in conflict with energy policy. 	<ul style="list-style-type: none"> Policy measures addressing EU climate change targets were already in place (e.g. forest conversion and remediation programs). Federal states (e.g. Bavaria) adopted their own biodiversity strategies with alternative targets (horizontal incoherence).
Ireland	<ul style="list-style-type: none"> Coherent in its afforestation goals but in conflict with recreational use of forest landscapes and renewable energy policy (e.g. windmills). 	<ul style="list-style-type: none"> Private afforestation increased radically due to EU RDP, while subsequent changes in nature protection (e.g. Natura 2000) and agricultural support reversed this trend.
Italy	<ul style="list-style-type: none"> Spatial variations (e.g. mountains vs. plain areas) in nature conservation goals and production forestry. 	<ul style="list-style-type: none"> Attention on forests in plain areas has grown, while semi-natural forests are increasingly abandoned. Nature conservation measures have changed from ex-ante interventions to ex-post restoration.
Lithuania	<ul style="list-style-type: none"> Environmental values are integrated into timber production but there are incoherencies between afforestation, renewable energy and environmental goals. 	<ul style="list-style-type: none"> EU policy (e.g. climate) has been adapted in a top-down fashion, while the forest sector has remained relatively unchanged since independence, opposing significant forest reforms.
Netherlands	<ul style="list-style-type: none"> Afforestation measures and the expansion of production forestry are in conflict with nature conservation goals and local management (e.g. reducing active management). 	<ul style="list-style-type: none"> Influence from EU policies (e.g. Natura 2000) is perceived as strong, with concrete effects on forest management.
Portugal	<ul style="list-style-type: none"> Absence of forestry policy instruments for set rural development targets. Lack of regulatory reinforcement & continuity. 	<ul style="list-style-type: none"> Forest policy has weakened (in terms of command-and-control) in recent years. Production forestry dependent on EU incentives.
Slovakia	<ul style="list-style-type: none"> Nature conservation goals are in conflict with forest management goals. Policy goals set for forestry practices are incoherent (e.g. conflicting measures are required by law). 	<ul style="list-style-type: none"> Major policy conflicts between forest and nature conservation actors (e.g., for Natura 2000 non-interventions zones).
Sweden	<ul style="list-style-type: none"> Lack of cross-sectoral coordination (e.g. water and forest policy). Nature conservation goals are in conflict with forest management goals. 	<ul style="list-style-type: none"> Forest Kingdom Policy has been influenced by rural development and employment policies.



These past developments raise open questions about the future. In its present reformed state, the CAP has allocated increasing flexibility for Member States in developing their RDPs. On the one hand, this flexibility will arguably allow Member States to **adopt measures that better fit the needs of their regions**. On the other hand, even though there are presently more measures available for the forest sector to draw on, past experiences and research results (both from INTEGRAL and other projects) indicate a **decreasing interest in taking up forestry-related measures** in certain countries and regions. It is hence possible that less forestry-related measures will be included in national RDPs for the 2014-2020 programming period.

It can be expected that **European structural and investment funds**, such as the European Agricultural Fund for Rural Development (EAFRD) and the European Regional Development Fund (ERDF) will continue to offer measures that support forestry. With a strong emphasis on SFM, the EAFRD is likely to remain the main instrument for the implementation of the **new EU Forest Strategy** and any Action Plan that may come. In addition to this, the **LEADER approach**, which relies on local empowerment (e.g., supporting young rural entrepreneurs) through local strategy development and resource allocation, has the potential to become a prominent instrument for rural development and forestry. It is, however, too early to assess the impact these instruments may have on forest policy and management, especially as Member States are still developing their RDPs (e.g. making choices for Direct Payment Schemes) for implementation in 2015 and beyond. Nevertheless, the new EU Forest Strategy as part of the rural development policy framework presents a more **holistic view on forests**. It stresses that forests are not only important for agriculture and commodity production but also for biodiversity conservation, water protection, climate change adaptation and bioenergy use. It also highlights the impact that other economic sectors and policy domains are having on forest ecosystems and the importance of taking this into account. While these are significant developments, experience and results from the past would suggest that due to its non-binding setup **the impact of the new EU Forest Strategy will remain limited in national forest policy** contexts.

TAKE HOME MESSAGES: EU rural development policy and sustainable forest landscape management



Photo: J. Winkler

- INTEGRAL results point to significant effects of cross-sectoral (*horizontal*) and EU to Member State level (*vertical*) policy fragmentation and incoherence at the landscape level in the implementation of forest-relevant rural development measures.
- The increased flexibility (as part of the reformed EU rural development policy) may allow Member States to address the heterogeneity of forest regions across Europe – for better or worse. This is in line with a softer approach where the EU only provides strategies, guidelines, recommendations and funding.
- The absence of a coherent and consistent EU regulatory framework for forests rather increases the risks that come along with an increased flexibility in policy implementation at Member State level.

3.2 EU nature conservation policy and sustainable forest landscape management

The EU Birds Directive (CEU, 1979) and the EU Habitats Directive (CEU, 1992) are the two cornerstones of EU nature conservation policy. The Nature Directives aim to maintain or restore, to a favourable conservation status, natural habitats and species of wild fauna and flora. The key instrument to meet these biodiversity conservation objectives is the establishment and management of an EU-wide network of special protection areas and special areas of conservation, called Natura 2000 network. The Nature Directives list the habitats and species that need to be protected. Over half of all Natura 2000 sites are forest areas meaning that 23% of the



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total EU forest area is designated for biodiversity conservation. It is interesting to note that the Natura 2000 network and the Nature Directives are currently undergoing a fitness check as part of the EU Smart Regulation policy. The fitness check of the EU Birds and Habitats Directives involves a comprehensive policy evaluation aimed at assessing whether this regulatory framework is fit for its purpose, and whether its aims are integrated with the objectives of other policy domains, among others.

Another crucial component of the EU environmental policy is the EU 2020 Biodiversity Strategy. This aims to halt the loss of biodiversity and improve the state of Europe's species, habitats, ecosystems and the services they provide by 2020, while strengthening the EU's contribution to averting global biodiversity loss (EC, 2011a). The strategy suggests specific measures to improve biodiversity through sustainable forestry, including development of forest management plans, use of rural development measures, ecosystem-based measures to increase the resilience of forests against fires, specific measures developed for Natura 2000 forest sites, afforestation in line with the ecological aspects of SFM, and optimal levels of deadwood, among others.

Studies show that the general public in Europe understands and appreciates the environmental function of forests more than their economic function (Rametsteiner and Kraxner 2003, Rametsteiner et al. 2007, EC, 2009). This is also confirmed in INTEGRAL research that reveals a **high level of public and expert concern for biodiversity conservation**. Further, biodiversity conservation was found to be perceived as **a key forest ecosystem service in most case studies, both now and in the future** (Sotirov et al., 2013, 2014a/b). INTEGRAL expert interviews, workshop discussions and forest modelling work suggest that increased wood production and/or certain intensive forest management regimes tend to reduce biodiversity. The **integration of timber production and biodiversity conservation** thus represented a key policy and management challenge in most case study countries. However, there are also specific examples of timber production and forest management activities that support nature conservation goals and foster forest biodiversity (e.g. the maintenance of hen harriers' habitats through active forest management in Ireland).

Key questions about how nature conservation and forestry should be spatially integrated at the forest landscape level were raised and discussed throughout the INTEGRAL research process. Two main integration options were identified: landscape level integration through spatial integration at lower forest management unit levels, and landscape level integration through spatial segregation. **Integrative forest management** was described as the situation where economic functions of forestry (timber production) are combined and delivered together with nature conservation within the same forest areas. **Segregative forest management** is an approach where (large to small) areas for nature conservation (natural reserves) are separated from (large) areas allocated for timber production and other forest ecosystem goods and services. In some of the INTEGRAL case study countries (France, Ireland, Lithuania, Sweden), nature conservation zones were set aside from timber production areas to a more or less strict extent. In contrast, the Netherlands has made attempts to apply an integrated forest management approach that emphasises natural processes, biodiversity and the 'beauty' of the forested landscape. However, due to recent policy changes involving budget cuts and re-orientation towards commodity production, it is likely that segregation of forest functions will increase in the future. In Germany, the federal biodiversity strategy, which aims at setting aside 5% of forests for natural processes, has been criticized at the sub-national level (Bavaria), as an integrative forest management approach is being practised which emphasises economically-oriented forest management activities while seeking to provide biodiversity conservation. An integration of different forest ecosystem services was considered in several case study areas to be impossible, not optimal or leading to important trade-offs. In a future perspective of very likely utilitarian scenarios, intensive forest management for economic purposes was coupled with strictly protected areas set aside for nature conservation. Now and in the future, nature conservation policy, like other policies, has to address the increasing pressure for biomass use driven by conflicting objectives in other policy and economic areas (e.g., bio-economy, bioenergy, land-use changes) at the EU and national level.



INTEGRAL results highlight that Natura 2000 has been implemented in the case study countries using either a **top-down, hierarchical approach** (e.g. Bulgaria, Lithuania and Slovakia) or through a more **bottom-up, participatory process** (e.g. France, Ireland and the Netherlands). Still, regardless of the approach, implementation challenges were identified. For example, Natura 2000 objectives aimed at establishing a heathland through felling coincidentally contradicted national law that bans felling in dunes in the Netherlands. In Slovakia and Lithuania, Natura2000 objectives of establishing non-intervention zones were established under time pressure and without sufficient budgetary funds to compensate the affected private and public forest owners. Further problems in the implementation process occurred due to a lack of understanding of the EU Birds and Habitat directives and their goals by (sub-)national authorities and target groups. In some countries, there was also a lack of involvement of forest owners and stakeholders in the implementation processes. Conflicts between forestry and nature protection groups are prevalent in most of the INTEGRAL case study countries. These **conflicts arise from competing core values, associated misperceptions and mutual mistrust**.

Thus, better communication, more dialogue, trust building and cooperation between environmentalists and forestry actors is crucial for the future. These aspects are currently being considered at the EU level where a participatory process towards an integration of biodiversity objectives and forestry practices is taking place with the aim of establishing EU guidelines on Natura 2000 and forests. Still, much is to be done to translate this new spirit of cooperation down to national, subnational and local levels of governance. Securing and up-taking adequate funding, including financial incentives and compensations, where appropriate, is necessary. Member States did not, for instance, make full use of the available CAP funds for Natura 2000 implementation in the previous programming period (2007-2013 (see section 3.1). There is hence a need to strengthen the uptake of EU funds for Natura 2000. For instance, Member States should use available EU and national funding to compensate forest owners for any justifiable loss of income and acknowledge their efforts regarding ecological aspects of SFM. Rewards for good forestry practices in Natura 2000 areas could potentially enhance its implementation. Without funding for ecosystems services (e.g. provisioning and regulating services), it is unlikely that more forest owners will change their management practices.

TAKE HOME MESSAGES: EU nature conservation policy and sustainable forest landscape management



Photo: S. Storch

- Forests are very important for biodiversity conservation in Europe where society rather prioritises ecological aspects of SFM in comparison to other forest goods and services.
- The integration of timber use and biodiversity conservation represents a key policy and management challenge in most EU countries under study.
- Economically-oriented forest management can be detrimental, and to a lesser extent beneficial for biodiversity. Similarly, integrative and segregative forest management approaches can have advantages and disadvantages for biodiversity conservation.
- More effective implementation of Natura 2000 in forests requires more communication, transparency, funding, uptake of funding opportunities and cooperation between environmentalists and forestry actors.

3.3 EU water and soil protection policy and sustainable forest landscape management

The EU Water Framework Directive (WFD) (EP/CEU, 2000) establishes an **integrated and coordinated framework for the sustainable management of water**. The overriding goal of the Directive is to ensure an enhanced protection and improvement of the aquatic environment and to prevent further deterioration of water bodies in Europe. It promotes sustainable water use with the ulterior goal to achieve and/or maintain



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favourable ecological statuses in rivers, lakes, estuaries, coastal waters and groundwater by the end of 2015. The Directive requires an estimation of land-use patterns, including identification of the main urban, industrial and agricultural areas and, where relevant, fisheries and forests in all Member States. From a water protection perspective, **forestry** operations at stand and catchment levels can have both **negative and positive influences on water** through relevant hydrological, biological and chemical processes.

INTEGRAL research reveals that forest conservation and protection, including the protection of water and soils were one of the top issues of policy and expert debates at the landscape level. The **pro-protection arguments** highlighted the necessity to protect and conserve forests in order to ensure established environmental objectives, such as water protection. In contrast, the **production-oriented arguments** emphasised the importance of timber production. These two discourses highlight important **societal struggles as regards the provision of different forest ecosystem goods and services**, such as timber, clean water and soil protection. However, on the whole, soil and water protection were generally identified by many interviewees from the INTEGRAL case studies as the best means of satisfying human needs for water (both in quantity and quality) and to some extent forest primary production (soil quality).

Given the strong interlinkages between forest and water management and the potential incidence of trade-offs between these two, the issue of policy incoherence is highly relevant. In this case, the **level of coherence varies significantly between the different case study countries**. For example, a water protection management program in Slovakia is characterized by less intensive tending to optimise the water management function of forests at the expense of economic production. In other case study countries, incoherencies between the goals of wood mobilization and other goods and services (e.g., water, soil protection) have been identified. In France, Germany and Ireland, for example, forestry activities are in some cases conflicting with water management, biodiversity and environmental zoning. Also in the Swedish case study, it was reported that the water sector lacks coordination with other sectors with regards to sustainability in consumptive and economic terms. One reason for this is that each respective policy area and economic sector often has coherent and well-defined sustainability objectives, however, they do not engage in cross-sectoral communication to develop an **integrated common vision of sustainability** or to **agree on trade-offs between incoherent policy objectives**. The end result is that, aside from the practical difficulties involved in implementing sustainability concepts, conflicts occurred between the various sectors operating within the same forest landscapes.

One particular issue of ecological concern that was raised throughout the INTEGRAL case study research was the use of **new forest harvesting technologies** and damage to forest soils caused, for instance, by the use of harvesting machinery in rainy periods when the soil is muddy or by the weight of the new machinery. Along with the increased compaction of forest soils (due to the use of mechanized harvesting) there were also concerns regarding the impact on water quality, for instance, in the case of aerial fertilization and lubricants used by power machines. In response to such concerns, guidelines have been introduced by several forest administrations. Interestingly, where such guidelines have not yet been made public, both forest operators and local officers expressed a desire for the introduction of stricter controls and development of commonly agreed guidelines. Reasons behind this were to **ensure homogeneity in technical performances** by different forest workers and to avoid possible legal claims due to the negative environmental impacts of some of the current (intensive) forestry practices.

From a future perspective, experts in several countries (e.g. Germany, Lithuania, Ireland, and Sweden) mentioned improved **water and soil protection as a desired endpoint**. In a forest landscape area in Ireland which was less suitable for timber production, stakeholders were willing to accept a significant drop in productivity in exchange for improved water quality. When asked about policy options for how to better integrate SFM with water and soil protection objectives, stakeholders suggested a range of **regulatory measures**, such as **national strategies on catchment level, catchment level planning** (including, for example, timing of forest harvesting operations), and **better coordination of activities** between forest owners. In general,



it is clear that **more collaborative measures** are needed in order to foster dialogue between the different policy domains and land-use sectors that have an impact on water and soils. This is supported by many stakeholders who noted that forest management planning should be participatory and that more awareness raising activities aimed at the public and forest owners are required to highlight the importance of water and soil quality. Clearly, in certain forest landscape areas, demands relating to water and soil management need to be further coordinated and balanced with forest management. This is especially relevant for the future since the provision of marketable wood products and services and non-market supporting and regulating services (e.g. water and soil protection) are likely to increase or remain stable according to most of the scenarios developed in INTEGRAL.

The WFD has been **criticised for not clearly recognizing the provision of water-related ecosystem services by forests** while timber-production forestry is considered an ecological risk to (or pressure on) water (Pülzl et al., 2013). This essentially means that the benefits of forests and forest management in achieving a favourable ecological status for water catchment areas has not been clearly recognised, which in turn demonstrates the clear **absence of a voice for forest sector interests**. One strategy to strive for **better policy integration between forestry and water in the EU** is to acknowledge their similarities and to deal with their fundamental differences. Some of their **similarities** relate to the large amount and variety of ecosystem services provided by both socio-ecological systems, the increasing pressure on these natural resources and their ecosystem services, and the linkages between them as ecosystems and the (long) time scale necessary for restoration. Some of the **differences** are to be found in the trans-boundary nature of water issues and the human right to safe drinking water and sanitation, two aspects that hardly apply to forestry (Winkel et al., 2009). Importantly, water policy is an established competence of the European Union. Generally speaking, the WFD directive needs to better acknowledge the complex interplay between water management and forestry. INTEGRAL results highlight the importance of integrating local land-use planning into national level strategies aimed at particular desired future outcomes. Future policy incentives need to better acknowledge the **complex interplay between different ecosystem goods and services** and to aim for **better policy coordination and integration** across different policy areas in the European forest landscapes.

TAKE HOME MESSAGES: EU water and soil protection policy and sustainable forest landscape management



Photo: Technical University in Zvolen

- The EU Water Framework Directive is the main instrument to protect water quality which is a clearly set policy objective and highly demanded ecosystem service in Europe.
- While the Directive sets up an integrated approach to (river) landscape management, it identifies forests only as a pressure on water even though forests can also play a key role in ensuring water quality protection.
- There are many trade-offs, a large degree of policy incoherence and a lack of cross-sectoral cooperation between water management, soil protection, and forestry that need to be addressed, now and in the future at the EU, (sub-) national and landscape levels.
- The Water Framework Directive can and should be used to improve coordination between water management and forestry while considering their similarities and differences.
- Forest operators and local forest officers have expressed the desire to have commonly agreed guidelines and procedures for water and soil protection. These would help to ensure homogeneity in forestry operations, to support forest primary production and to meet human needs.



3.4 EU climate policy and sustainable forest landscape management

EU efforts to address climate change are intrinsically interlinked with other policy domains presented in this report, such as rural development and energy policy (see section 3.1, 3.5 and 3.7). Several EU climate change policy documents have direct implications for forest landscape management. Amongst these, the **EU 2020 Climate and Energy Package** (a set of binding legislation) is often related to and considered important for forests. The Package commits Member States to reduce their emissions, increase the share of renewable energy and increase energy efficiency by 20% by 2020 – the so-called “20-20-20” targets (EP/CEU, 2009a/b). The new **2030 Climate and Energy Policy Framework** (CEU, 2014; EC, 2014b) builds on the Package and takes into account the Energy Roadmap 2050, the Roadmap for moving to a competitive low carbon economy in 2050, and the White Paper on transport (EC, 2011b/c/d), reflecting the goal to reduce GHG emissions by 80-95% by 2050. Two policy instruments that are often noted as being central to achieving the “20-20-20” target are the **EU Emissions Trading Scheme Directive (ETS)** – currently undergoing a reform – and the **Effort Sharing Decision (ESD)**. Even though the EU ETS promotes the use of woody biomass as a carbon-neutral energy source, the GHG emissions resulting from **LULUCF** are not included in its present form. To address this issue and to strengthen the capacity of forests to preserve and capture GHGs, the EU adopted accounting rules on GHG emissions and removals resulting from activities relating to LULUCF in 2013 (Decision 529/2013/EU).

This section highlights the significance of EU climate policy for forest management at the landscape level. For instance, forest ecosystems in Europe took up 6.6% of the GHG emissions in the first commitment period of the Kyoto Protocol under the UNFCCC. **Carbon sequestration is considered as an explicit goal of forest management** in most of the INTEGRAL case study countries as carbon storage is considered a desirable endpoint. This precedes and can build the ground for policy changes in the near future. For instance, the new EU Climate and Energy Policy Framework sets out to reduce GHG emissions by 40% by 2030. It has also been decided that the LULUCF sector will be integrated into the 2030 climate framework, meaning that it should contribute to the established reduction targets. The European Commission is currently assessing policy options for how to integrate LULUCF and a legislative proposal is expected to be presented in 2016. These policy developments will undoubtedly carry significant implications for how forests will be managed in the years to come. To illustrate, the LULUCF sector is a net sink of emissions, but carbon removals are not permanent due to storms, fires, floods and pests. This means that there are large inter-annual variations in emissions and the emissions balance sheets are in turn subject to significant recalculations. Only when the accounting system has been proven to be robust and effective, significant policy and management changes (e.g. fixed GHG targets) for the forestry sector can be expected.

INTEGRAL research identifies a **variety of domestic climate change policies** across the case study countries. For example, whereas afforestation measures in Ireland are part of the climate change mitigation policy, state incentives (e.g., subsidies) for carbon sequestration in Portugal are provided to forest owners who grow herbaceous covers under trees. Another illustration are attempts made in Italy to establish a regional and economically viable carbon market where carbon credits can be sold and purchased on a voluntary basis. Overall, the idea to provide forest owners with financial incentives and/or **compensation for carbon sequestration** came up in nearly all INTEGRAL scenario workshops. The responsiveness of forest owners to such initiatives is dependent on **economic factors**, such as their level of dependence on their forest resources, and their **motivational** and **value-related** profiles (e.g. economic-oriented, traditional, passive and ecologically-oriented forest owners).

In addition to maintaining carbon stocks, the increased use of wood as a raw material can in principle contribute to a low carbon economy and climate change mitigation through **substitution**. In the French case study, for example, EU and national climate policy roadmaps have generated a new focus on increasing wood mobilization. Young, growing forests arguably capture more carbon than old forests, and substituting high



carbon building materials or fossil-based plastics with wood as well as burning waste wood (e.g. offshoots from sawmills and disused palettes) can have a positive effect on the carbon balance. There is, nevertheless, growing evidence that the use of **wood can also increase GHG emissions**, such as directly through burning, or indirectly through intensified forest use (e.g. from soils or machinery). These insights from research and practice are visible at the EU level where efforts are being made to promote the **cascading use of wood** in order to stimulate more efficient use of timber for the sake of carbon storage, ensuring supply of raw materials for the woodworking industries and supporting nature conservation goals. There is, however, a strong need for better understanding, monitoring and reporting on inventories regarding carbon balances, including the role of forest soils. It seems that future policy efforts would incentivise Member States to report at the local and national level, e.g. at scales that are more comparable to the current Kyoto standards.

INTEGRAL research assessed the capacity of the case study areas for carbon sequestration. This has principally been achieved through a combination of forest modelling work, expert interviews and participatory workshops. These simulations resulted in the identification of a number of **positive co-benefits associated with high forest carbon stocks**. More specifically, increasing carbon storage implied enhancing biodiversity conservation in the cases of Bulgaria and Italy, improved natural dynamics in the case of the Netherlands, and increased dead wood, deciduous fraction, large deciduous trees and large conifer trees in the case of Sweden. On the other hand, in cases where carbon storage was prioritised and/or maximised, the best results were always achieved when forest management intensity and timber production were at their lowest level. This was the case, for example, for the German forest carbon storage indicator, which included both living biomass and wood products, including the substitution of fossil fuels by wood products.

Another crucial component for EU climate change policy concerns the topic of **adaptation**. Forests are expected to be exposed to more droughts and forest fires (e.g. in Southern and Eastern Europe) as well as more storms and pest-related calamities (e.g. in Central and Northern Europe) influencing timber markets and other ecosystems services in the future. These concerns are reflected at the EU level through the EU Strategy on Adapting to Climate Change (EC, 2013c) and the European Forest Fire Information System (EFFIS). Climate change adaptation has also been noted in all relevant EU funding programmes for 2014-2020. For instance, the European Structural and Investment Funds (ESIF) as well as Horizon 2020 (EU programme for research and innovation) and the LIFE programme (EU instrument for environmental protection) provide significant support to Member States, regions and cities to invest in projects concerning adaptation to climate change.

INTEGRAL research shows that **climate-driven developments** can also be found at the landscape level where storm-driven events play a pivotal role in fostering the **adoption of new technologies**, such as new machinery or logistics approaches. Efforts to adapt forests to climate change through **changes in composition of tree species** are complex and there has been varying progress in this regard across the case study countries, which is often linked to socio-economic and ecological factors. For instance, the increasing risk of forest fires in Italy and Portugal is reinforced through rural depopulation, together with a decrease in active forest management and lower profitability causing (amongst other things) an increase in the amount of flammable material in the forests. Active forest landscape management, supported by rural development policy and forestry co-operatives, seems to help maintain and develop healthy forests that are more resistant to climate change and resulting natural hazards, such as storms and forest fires.

Taken together, the case studies also demonstrate that issues related to carbon sequestration, substitution and adaptation to climate change need to be linked more clearly with a discussion on how forest owners' properties can be protected better and how support for forest owners can be improved in financial terms. Some examples are clearly defined post-event restoration plans, EU and national subsidies or private insurance contracts. It also calls for better tools to **anticipate, calibrate and appraise natural risks** and their effects. There is furthermore a need for **more research on how trees and forest ecosystems react** in the context of climate change, e.g. risk models for climate change strategies and forest fire models. A better integration of forest and risk management could be achieved through integrated and adaptive management. Footprint



analyses could also be conducted in order to consider **trade-offs in land use and product substitution** on a global level. This would allow global concerns (e.g. deforestation and climate change) to be included in local forest stewardship considerations. For instance, in many cases, the global perspective conflicts with local perspectives. One illustration would be the case of France and Germany where the global energy perspective points towards more emphasis on biomass and energy production, while, at the same time, local forest management perspectives favour more value-added wood uses and the maintenance of mature forest stands for the provision of other ecosystem services (e.g., carbon, biodiversity). In other cases, the local and global perspectives coincide, such as in Ireland, where peatlands are not highly suited for timber production and could be set aside for carbon sequestration and biodiversity conservation.

TAKE HOME MESSAGES: EU climate policy and sustainable forest landscape management



TRANSFORMATION OF FORESTS AFTER WINDTHROW IN CENTRAL EUROPE.
Photo: A. Selter

- Carbon sequestration and emission accounting will become more relevant for forest management in the future with the integration of Land Use, Land-Use Change and Forestry in the EU's greenhouse gas mitigation framework.
- A robust accounting system is needed to significantly change policies and management practices.
- Climate mitigation and adaptation goals are implemented differently in forest management in the EU countries under study.
- It is very important to consider the complex interdependencies between adaptation and mitigation goals, local actions and global footprints, carbon storage in forests and in wood products.
- More research and development of forest simulations, models, carbon footprints and policy evaluation is needed for a better understanding of the links between forest ecosystems and climate change.

3.5 EU bioenergy policy and sustainable forest landscape management

The EU Directive on the use of energy from renewable sources (EP/CEU, 2009b) is the most stringent piece of legislation as regards the use of renewable energy sources, including woody biomass. As part of the EU Climate and Energy Package (CEU, 2008) and the recent 2030 Climate and Energy Policy Framework (CEU, 2014), the Directive sets legally binding targets at both the EU and national levels to reach a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy in the transport sector. The Directive also requires national action plans for the development of renewable energy, and the development of sustainability criteria, including monitoring and reporting requirements for liquid biofuels generated from forest biomass. GHG emissions resulting from indirect land-use changes are not included in the reporting requirements. To address this gap, the Commission has issued a proposal for a new directive on the promotion of energy from renewable sources (EC, 2012b). Several EU policy documents that have implications for how forest landscapes are managed address energy and climate change in conjunction. For example, it is foreseen that the new Renewable Energy Directive will take the GHG emissions from **Land Use, Land-Use Change and Forestry (LULUCF)** into account and propose ways to reduce them while considering existing investments in biofuel production from forest biomass. There are hence strong **interlinkages between bioenergy-related actions and climate policy** (see also section 3.4).

This EU policy framework implies that if bioenergy targets are to be met, large-scale changes to current forest land-use patterns have to be adopted. These changes relate more directly to forest management and the use



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of forest biomass for energy generation. INTEGRAL research confirmed that EU bioenergy policy has a strong influence on practical forestry across Europe. For instance, bioenergy was identified in all countries under study as the **most rapidly growing sector**, even if different utilisation patterns and trends were emphasised across case studies. The **doubling of consumption of wood for energy in the last decade** is a common trend. In these cases, fuel wood and forest chips were identified as forest products produced through active forest management. In France, Germany and Sweden, **woody biomass energy is already a well-established and structured market**. Timber supply (e.g. round wood and industrial wood) does however retain its overall relevance, especially for publicly owned and large forest areas, whereas private and small owners were inclined to consider its production as primarily relevant. The significance of grey markets or self-subsistence uses was also stressed.

INTEGRAL research shows that renewable energy is discussed as a top issue in the forest policy debates in the majority of the case studies, and that this issue is **significantly interlinked with climate change topics** at the national level, similar to the EU-level. However, some forest stakeholders do not necessarily consider the increased use of wood as bio-energy as positive development (e.g., in France, Germany, Italy). Examples include the promotion of intensified forest management (e.g. in Sweden), conflicts with nature protection interests (e.g., in France, Germany, Italy), or other types of renewable energy sources, such as wind, competing for the same land area (e.g. in Germany, Ireland). It was also emphasised in several of the case studies that the **bioenergy sector is being artificially sustained through EU and national subsidies** (e.g. in France, the Netherlands and Slovakia). In particular, EU funds were a relevant factor influencing forest management choices as regards afforestation, intensity of forest plantations, construction of forest roads and increases in wood mobilization in all case studies. This is interlinked with a growing production and demand for wood chips (e.g. in Germany, Italy, Lithuania and Sweden) resulting in a competition between wood working and wood processing industries (e.g. wood boards, wood panels, pulp and paper) and bio-energy producers. This **competition between material and energetic use of wood has already been acknowledged as increasing** (e.g. in France, Germany, Ireland and Sweden). All the more, some case study findings imply that due to this increase the natural boundary of sustainable timber harvest will soon be reached (e.g. in Germany). The forestry sector may, in the near or mid-term future, even suffer from a shortage of available harvestable wood due to excessive timber harvesting in the past (e.g. in Slovakia). This demonstrates the need to address the profound **material conflict between the use of timber as raw material and as a source for bio-energy** across EU Member States.

Although the growing competition for wood as a raw material is prompting new concerns, it has also generated opportunities for European forest-based industries. The INTEGRAL research reports an **accelerated development of enabling technologies**. For instance, new bioenergy plants have been established throughout the EU. In some cases, technologies have been developed to retro-fit existing power plants to create combined heat and power (CHP) plants; in others, technologies have been developed to manufacture wood pellets and the stoves that burn pellets. High hopes have also been expressed as regards the development of second-generation biofuels for transport, such as methanol, dimethyl ether (DME) and synthetic diesel and ethanol produced from cellulose. Other examples of **technological rationalization** come from the sawmill industry that has contracted considerably (with a steady decline in the number of sawmills in Europe) while the total amount of processed wood has not decreased. The pulp and paper industry has also undergone considerable consolidation and an overall increase in commodity production. The latter examples are not only driven by the bioenergy sector but are also influenced by a general trend affecting European forest-based industries.

In a **future perspective**, INTEGRAL scenarios show that the issue of **bioenergy will remain highly relevant**, especially in terms of biofuel production as an important influencing factor for future forest management. Although there are significant regional variations in the importance assigned to the factor bioenergy, it was a major driver in several of the INTEGRAL future scenarios. Increasing biomass production for bioenergy or biofuel use is, for example, often associated with more **intensive management and shorter rotation forestry in**



the years and decades to come. Transition towards futures involving increased wood production could be supported through changes in forest species composition such as using fast growing trees (e.g. poplars, black locust and willows) in preference to traditional species. Next to the association with **production-oriented futures** (e.g. utilitarian future scenario in the Netherlands), increasing biomass production has also been combined with **strict set-asides for nature conservation or carbon storage** (e.g. climate change mitigation scenario in Lithuania).

One of the most important issues highlighted by INTEGRAL research on current and future developments in the bioenergy sector concerns the **need to balance trade-offs between timber production for construction, nature conservation and the use of wood for bioenergy.** This is emphasized by variations across the case studies, not only concerning demands from other sectors (e.g. agriculture, water and climate) but also varying institutional competencies. In this regard, new EU and national bioenergy objectives (e.g. binding renewable energy targets) are currently introduced within an already **incoherent and inconsistent forest policy framework.** With increasingly stringent bioenergy targets and regulations, we can assume that the EU forest policy regime will be faced with increasingly more powerful political pressure favouring bioenergy use, climate change mitigation or adaptation. For instance, at the EU level, the importance of renewable energy and bioeconomy and calls for cascading use of wood will presumably increase competition for political authority and decrease policy coherence related to forest management. As suggested by INTEGRAL, this will require an integrated approach to forest management in order to find a balance between sustainable forestry and other forest-relevant land uses at the landscape level.

TAKE HOME MESSAGES: EU bioenergy policy and sustainable forest landscape management



WOOD AS BIOENERGY SOURCE

Photo: I. Zirkova

- The production and use of wood for energy is the most rapidly growing sector driven by stringent and ambitious EU and national energy and climate policies.
- The use of wood for bioenergy is at the intersection of many different sectoral EU and national policies and laws which leads to a complex and incoherent governance framework affecting forest management.
- There is growing competition between material and energetic use of wood at the same time that several regions and countries in Europe are approaching the natural boundary of sustainable timber harvest.
- In the face of increasing demand for renewable energy driven by policies and markets, the forest sector will have to resolve fundamental policy incoherencies as well as material and ideological conflicts.
- Now and in the future, there is a need for an integrated approach to addressing the imbalance between the use of timber as a raw material for construction and as a source of bio-energy on the one hand, and between timber use and nature conservation and other forest ecosystem goods and services, on the other hand.

3.6 Sustainable forestry governance within and beyond the EU: implementation of the EU Timber Regulation and Forest Footprints

Unsustainable forestry, illegal logging and a growing demand for forest products are some of the key factors contributing to the rapid destruction of the world's forest. In the past two decades, mostly voluntary forest policy approaches have been designed and used to fight illegal timber logging and trade. **Non-state market-driven forest certification** (e.g. Forest Stewardship Council (FSC) and the **EU Forest Law Enforcement,**



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Governance and Trade (FLEGT) action plan relying on Voluntary Partnership agreements (VPAs) (CEU, 2005) between timber exporting countries and the EU) have been used to support sustainable forest practices, illegal logging controls and market incentives for legal material. More recently, the focus has shifted towards **legally-binding regulations** for detecting and banning illegal wood from supply chains, including the US Lacey Act, the Australian Illegal logging regulation, and the **EU Timber Regulation (EUTR)** (EP/CEU, 2010). The EUTR was adopted at the EU level to “complement and strengthen the FLEGT VPA initiative and improve synergies between policies aimed at the conservation of forests and the achievement of a high level of environmental protection” (CEU, 2005/2010, EC 2012 c/d). EUTR, and in principle the FLEGT VPAs, set out legally binding measures for Member States and exporting countries that aim at combating illegal timber logging and trade as well as improving forest governance. The EU and its Member States are among the main world consumers of timber and timber products and key players in international forest politics. Policies like the EU FLEGT action plan and the EUTR thus have the potential to influence European and global environmental and social ‘footprints’ affecting forest land, natural resources, climate, governance, and human welfare in timber producing and exporting countries.

INTEGRAL results demonstrate that the complexities of distinguishing legal from illegal timber, the tracking of global supply chains, polarized European politics as regards ‘sustainable forest management’, and particular interest conflicts between state and non-state actors made the negotiation and adoption of the EUTR a challenging and protracted policy process. Key points of the Regulation that were subject to particular controversy included the focus on **legality instead of sustainability**, the **command-and-control approach** of overall **prohibition** for the placing of illegal wood on the EU market, regulatory checks and penalties (in contrast to limiting the scope to a business-friendly, risk-based approach of due diligence system), the **target groups of the regulation** (now including both timber traders/importers and domestic timber producers/owners) and the **scope of materials** subject to the regulation. The EUTR could be adopted only after a **broad alliance** of environmental NGOs, parts of the forest industry (mainly timber traders and large retailers), supportive Member States (timber importers), the European Parliament and the Commission was able to win the debates against the resistance of public and private forest owners, parts of the forest industries (woodworking, pulp and paper), Member States (mainly timber exporters), parts of the Commission and the Council (Sotirov et al. 2015).

INTEGRAL results demonstrate that the formal enforcement and practical implementation of the EUTR vary significantly between EU Member States. **Different political cultures, administrative capacities and socio-economic conditions** have been found to influence the **varying degree of domestic (non-)implementation and enforcement of the regulation**. Since 2013, the domestic implementation of EUTR can be classified into four “worlds of compliances”. Some countries have focused on both effective formal implementation and practical enforcement while other countries have prioritised the formal uptake of the regulation in national law but not its practical enforcement. Further countries have neglected both formal and practical implementation altogether, whereas others have disputed the formal aspects but implemented the EUTR in practical terms due their existing (in-)formal structures (Sotirov, 2015).

An important factor in the uneven implementation of the regulation across the EU countries can be attributed to different **capacities and resources to achieve effective enforcement**. Between 2013 and 2014, in most cases the regulation was not strongly enforced by the respective competent authorities. At this early stage of the regulation, state authorities primarily engaged in **exchange of information and expertise** with different actors, ranging from NGOs that can submit ‘substantiated concerns’ and act as whistle blowers on possible illegal activities, to larger timber companies with pre-existing knowledge about and experience with due diligence and supply chain tracking. In some cases, where the regulation has already been put into place, designation of competent authorities and penalties are still to be completed. Additionally, INTEGRAL research shows that economic operators and stakeholders consider the uneven implementation to be a key issue to be resolved. The issues relate to lack of **uniformity and consistency in procedures and requirements** demanded by



competent authorities across Member States. This is particularly important for economic operators within the EU that fear **loss of competitive advantage** due to different national regulations (ranging from stringent to relaxed to non-existent). Some economic operators also face **significant administrative burdens and economic costs** associated with the implementation of the EUTR (e.g. additional time and personnel, legality documentation, translation of documents).

INTEGRAL results show that EUTR has also been perceived by economic operators and stakeholders as bringing **new opportunities and advantages to the timber sector and environmental protection goals**. The regulation has often been described as a positive step towards achieving timber legality and forest sustainability as well as having a positive impact on the international reputational image, and hence on the business operations of the European timber industry, especially for operators importing from tropical countries. The EUTR has additionally been noted as encouraging **fair competition** (e.g. eliminating illegal operations) and **protecting the European timber market**, particularly since the price of legal timber is expected to increase. Possible non-desirable effects include the shift of timber trade towards **less regulated and less demanding markets**, as well as possible unintended impacts on the **use and uptake of forest certification schemes**, which could ultimately undermine broader sustainability targets (Schwer/Sotirov 2014). In particular, forest certification schemes for demonstrating timber legality has been a subject of great controversy between many actors because **certified products are not exempted from due diligence** (e.g. EUTR does not recognize certification schemes as a proof of legality). This has generated a conflict between those who believe a green lane should be granted for products covered by recognized forest certification schemes, and those who believe no exemptions from due diligence should be permitted. The debate has focused on issues linked to responsibility (e.g. legal liability in the case that illegal timber is found), the role of voluntary certification schemes, and the implications of recognizing voluntary schemes as being compliant with EU law (Dieguez and Sotirov, 2015).

The core driver behind the INTEGRAL **forest footprint research** (McDermott et al. 2015) is the recognition that sustainability requires both sustainable consumption and production. Both of these are linked to the choices people make regarding where and how forest products should be produced. More specifically, the consumption of wood (and other products) leaves an **environmental and social 'footprint'** during its production and use. This means that if people in one region, country or jurisdiction (e.g., the EU) reduce local production without reducing consumption, an **unsustainable footprint is simply produced elsewhere**. The problem in this instance is that most forest management and landscape planning focus only on local production, whether referring to wood, forest ecosystem goods and services or other valued outputs. One purpose of the INTEGRAL footprint research was therefore to illustrate ways to bring footprint thinking, or 'global stewardship', into integrated forest management planning in the pursuit of 'local stewardship'.

The case study research results illustrate not only the importance of integrating global and local forest stewardship but also the complexities and trade-offs involved in doing so. Results from the INTEGRAL footprint research indicate that **production per capita has the strongest relationship with consumption per capita for industrial roundwood** in the case study countries. It is not surprising that production increases with rising demand for wood products. However, it is interesting that this increase is **decoupled from changes in per capita GDP** in many countries, suggesting that production could also be driving demand and thus increase the forest footprint. Concerning the relationship between **consumption and GDP per capita**, INTEGRAL research shows a positive correlation in most of the countries. However, in a few countries the correlation was negative, while in others, GDP appeared not to play a significant role in consumption (e.g. in sawnwood consumption in France, Germany and Ireland). The INTEGRAL footprint perspective therefore raises a number of key questions as regards to **what** should be produced and **where** as well as **who** should be involved in the decision-making.





LEGAL TIMBER TRADE

Photo: H. Aureliu-Florin

- The EU FLEGT Action Plan and the EU Timber Regulation are the two main policies that aim to halt the trade of illegal timber in the EU while contributing to good forest governance and forest sustainability.
- Policy research shows that the uptake and effective implementation of the EU Timber Regulation vary significantly between EU Member States.
- EU Timber Regulation is perceived to bring new opportunities and advantages to the European timber sector (e.g. improved international image, strengthened competitiveness).
- Key challenges in the implementation of the EU Timber Regulation that need to be resolved include the lack of uniformity and consistency in rules and procedures demanded by competent authorities, insufficient administrative resources and capacities, perceived costs and burdens for economic operators and uncertainty in terms of proofs of legality (e.g., documentation, forest certification, due diligence).
- Forest footprint research illustrates the importance of integrating global and local stewardship and the complexities and trade-offs involved in doing so.
- While production increases with rising demand for wood products, research results show that changes in production could be driving demand.

3.7 EU bioeconomy strategy and circular economy, and sustainable forest landscape management

The European Commission launched a new Bioeconomy Strategy and Action Plan in 2012, aiming to ensure food security while paving the way to lower emissions and a resource efficient and competitive society, all within the boundaries of sustainable use of renewable resources and environmental protection. The bioeconomy is considered to be a **key component for smart and green growth in the EU**, emphasising an economy that is based on the use of biomass resources instead of fossil fuels (EC, 2012a). It is presented as an important aspect of the European economy and society in terms of creating opportunities in different sectors and expanding the output of bio-based products. The bioeconomy is essentially a **cross-sectorial concept** that is relevant for a range of sectors, including forestry, agriculture, food, chemicals and bioenergy (McCormick/Kautto, 2013). Accordingly, the EU Bioeconomy Strategy outlines a cross-sectoral and interdisciplinary approach that addresses not only the environment and energy production, but also food supply and natural resource challenges at a general, over-arching level (EC, 2012a). The Strategy is perceived as representing a significant opportunity for forestry, in particular in relation to investments in research, innovation and skills.

Also related to the Strategy is the **Circular Economy Package**, which will be presented by the Commission in late 2015. The package principally relates to waste (e.g. it is expected to include a new legislative proposal on waste targets) and it also covers increasing efficient use of wood resources. One indication of the future importance of the circular economy strategy is a recent public-private partnership between the EU and the Bio-based Industries Consortium, which approved the funding of 10 research and demonstration projects totalling 120 million EUR in July 2015.

Concerns have nonetheless been raised about the **lack of reference to the forest-based sector** and forest landowners in the Bioeconomy Strategy (Hetemäki, 2014; Ollikainen, 2014). However, despite the absence of representation, the forest-based sector is arguably instrumental for implementing the Strategy. Within a



bioeconomy, and the wider green and circular economy, the forest sector interacts with energy and chemical industries.

The EU Bioeconomy Strategy is part of the green economy and closely related to the circular economy strategy (see Figure 1). The bioeconomy is therefore expected to play a significant role in the interplay between international, national and regional decision-making on forests. The most relevant spheres of EU activity in this regard are those dealing with carbon sequestration and climate change mitigation (e.g. harvested wood products), bioenergy (e.g. substitution of carbon-intensive materials) as well as environmental protection and nature conservation (Mubareka et al., 2014).

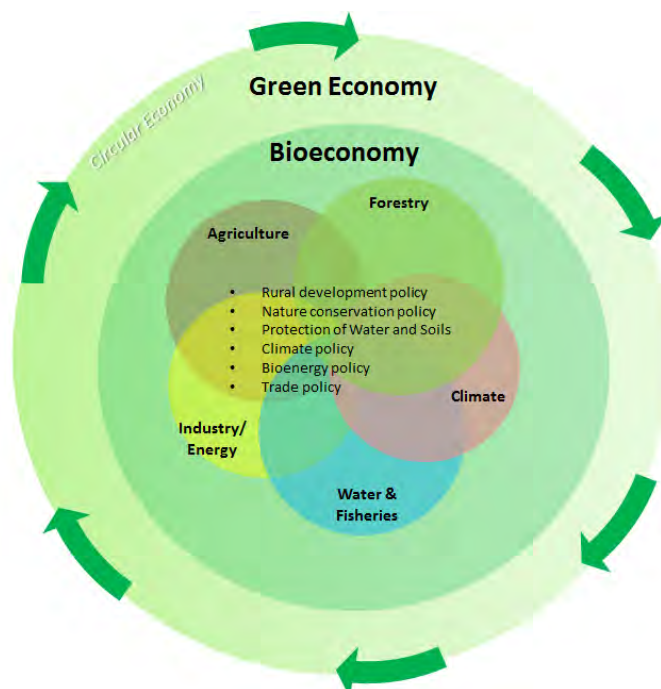


Figure 1: Bioeconomy as part of a green, circular economy: interactions between different sectors (own depiction)

The Strategy is in line with some of the key topics raised through the INTEGRAL scenario development process, where the “climate” and “energy” policy domains were often noted as significant factors for forest development. The Strategy can, if properly implemented, enhance sustainable and green growth that is likely to benefit forest-based industries in the long term (Hetemäki, 2014). The bioenergy sector (see section 3.5) is significantly interlinked with climate change policy (see section 3.4), representing a large part of the bioeconomy. For instance, as pointed out earlier, the rapidly increasing bioenergy sector, coupled with a significant rise in fossil fuel prices (at least until recently), has doubled energy wood consumption (and costs) in INTEGRAL countries. For this reason, policy and market trends in fuel-wood and biofuels are likely to be major drivers of future forest management according to several INTEGRAL scenarios. Biomass production in these scenarios is often associated with more intensive management and shorter rotation forestry. This implies **increased competing demands between energy and material uses of wood**. It is foreseen that the growing competition for wood as a raw material may accelerate the development of technologies (as well as supply shifts) that will enable continued diversification of input materials for processing within EU forest-based industries. This trend indicates that better coordination under the bioeconomy umbrella is needed and the **impacts of climate and bioenergy policies on forests and forestry** should be clarified to help establish better coherence between these policy domains while improving logistics of production chains and encouraging research and development.



The bioeconomy is also about **environmental protection and nature conservation** and how these relate to sustainability. Set in the context of the rapid depletion of natural resources and growing environmental pressures, the EU Bioeconomy Strategy calls for a paradigm change in the economic use of resources which could be summarised as ‘producing more with less’. Declining biodiversity can significantly degrade the quality of resources while constraining the yields of primary production, particularly in forestry and fisheries. However, visions of the bioeconomy and ecological sustainability often differ in the on-going bioeconomy discussion (Pfau et al., 2014). This is also the case in INTEGRAL countries where both conservation and sustainability have been highlighted as important for future forest management (see section 3.2). At the same time, **trade-offs between intensive forest management and forest nature conservation** were identified in the research process (e.g. nature conservation was one of the key factors mentioned by interviewed stakeholders in Western Europe). These identified trade-offs are not new but highlight a need for clarifying nature conservation and sustainability issues under the bioeconomy concept. The bioeconomy could provide the opportunity to facilitate balanced solutions with **sustainability as the common ground** for collaboration.

Finally, the bioeconomy is also about growth and job creation. The Strategy is expected to help **boost rural development and economies** by stimulating the demand for forest-related products. This is in line with the Common Agricultural and Rural Development Policy (see section 3.1) that highlights the clear advantage of developing regional bioeconomies. Measures geared towards small-scale production are expected to stimulate local economies that, in turn, will help to reduce transportation costs (and related GHG emissions) and enable local reuse of by-products. These aspects of rural development were noted as key influencing factors by stakeholders, especially in Eastern and Southern Europe within the INTEGRAL research process. Stakeholders also highlighted the increasing importance of the bioenergy market and EU subsidies in rural development with special emphasis on the Member States’ uptake of EU policies and subsidies. This demonstrates how the local and regional level is impacted by decision-making and demands at the macro level (national and EU level), raising open questions about how the Strategy will empower, or neglect stakeholders at the local level.

INTEGRAL results further indicate that **the importance of the European forest sector will increase in the future**, together with ever-growing societal demands for diverse provision of forest ecosystem goods and services. It also indicates that there is ample room for providing different solutions and types of ecosystem services. Taken together, this confirms the need for an integrated approach to forest landscape management. This is an approach that not only requires pro-active policy-making, but that can tackle the inherent trade-offs between different forest ecosystem services. There is need for a more **interactive policy-making process**, with greater emphasis on socio-economic and ecological aspects according to sustainability principles. An integrated forest management approach, inclusive of the diverse set of local stakeholders, should be able to address sustainability concerns as well as advance the development of the bioeconomy.





Photo: E. Galev

- The forest sector can become a key player in realising the EU Bioeconomy Strategy. Forests and forest management will be particularly important in the development of rural economies, employment, energy security and the environment through the substitution of non-renewable resources and by securing sustainable economic development for the future.
- The role of the forest sector in the EU Bioeconomy Strategy is however still unclear.
- Several coordination issues and sustainability challenges between the forestry sector and other policy domains such as energy, climate change, chemicals, agriculture, and nature conservation, have to be addressed.
- The fragmented regime of forest-related policies established at EU level confronts the EU Bioeconomy Strategy with the challenge for coordination and integration to be successfully implemented.

3.8 Non-wood forest products and sustainable forest landscape management

Non-Wood Forest Products (NWFP) refer to “goods of biological origin other than wood derived from forest, other wooded land and trees outside the forest” (FAO, 1999). **Other ecosystem services** are defined in accordance with the Millennium Ecosystem Assessment as “the benefits people obtain from ecosystems”, including very important forest land uses such as recreation and public health (MEA, 2005). There is no specific EU policy on non-wood forest products and other ecosystem services. This is a diverse and fragmented topic across EU and national policies and laws. Yet, they are of equal importance to any other forest-relevant policy domain and land use given their potential implications. For example, the demands for and the provision of **NWFP may affect options available for economically profitable wood production** or impose limits on the extraction of biomass for bioenergy use (Mavsar et al., 2008). These types of conflicting demands are reflected horizontally across the INTEGRAL case study areas as well as vertically (from the EU to national/regional level) in policy documents such as the EU Forest Strategy and Rural Development Regulation (SFC, 2008).

The importance of and demands for NWFP are clearly demonstrated in INTEGRAL research. For example, although timber sales, both at a national and local level, account for more than 90% of the revenues from state and municipal forests in the Bulgarian case studies, **timber is only a prerequisite** for further investments in other goods and services, such as **forest infrastructure** and **hunting-related activities**. It was also reported in the French case study that the prevailing multifunctional forestry assumes that revenues from wood production cover costs for public ecosystem goods and services, such as **mushroom picking and hiking**. In Portugal, the production of **raw cork and cork manufacturing** is of great importance as the country has reached a leading position with a growing export-driven cork oak industry worldwide. In one of the case study areas, **cork and pine nuts**, together with timber and fuel wood, represent the main sources of income for a majority of forest owners. These **varied revenue streams** demonstrate how a mix of forest ecosystem goods and services (pine nuts and cork from mixed pine-oak stands) are deliberately integrated in forest management systems and planning to optimise NWFP production and its economic importance for forest owners. In other INTEGRAL countries, NWFPs are simply provided as **by-products**, or **spill-over effects**, from timber-oriented forest management.



Mushrooms, truffles and berries produced and collected within the forest landscape were highlighted as particularly important across most INTEGRAL case study areas. These NWFPs play an **important role in national, international and grey markets** as well as for **self-consumption purposes**. For example, gathering truffles is a highly attractive activity for tourists in the Italian case study areas. Well-developed mechanisms for selling gathering licenses and permits provide significant economic revenues for certain municipalities, communities and forest owners. In some instances, truffle picking generated even higher revenues than traditional timber selling activities. In fact, picking truffles in public and private forests may not only be very profitable but has also stimulated local people to take on the same practice, both for self-consumption purposes and in terms of nurturing informal grey markets. The revenues generated from truffle picking are so high that landowners in Italy and Spain are planting mycorized seedlings to produce their own truffles, even fencing off their land to keep pickers from getting in without paying.

Wild game management and hunting was commonly identified as a significant NWFP in several case studies including Bulgaria, France, Germany, Italy, Lithuania and Slovakia. However, wildlife management and hunting is subject to very **distinct legislative and institutional structures** across all the Member States whereas the EU is generally restricted in formulating any relevant rules (except those related to biodiversity conservation). There are, for example, many differences in national and regional property rights as well as in the existence and design of structured markets for hunting. However, despite legislative and structural variations, it is clear that hunting is very important, not only as a source of income for forest owners but also as an important leisure activity for the general public. It is also an area of activity where **many inherent conflicts within the forest landscape** appear. One example of this is the wolf controversy in Sweden, where a conflict exist between hunting and nature conservation interests, principally because of wolf predation on game and the perceived threat to local traditions and livelihoods (Sjolander-Lindqvist, 2009). Hunting, and similar types of NWFPs, is consequently an area of operation that could benefit from an integrated approach to management in terms of addressing conflicting interests in the forest landscape.

Other ecosystem services are closely related to NWFPs and refer to the societal utilization of the forest landscape relating to activities such as **tourism and recreation** that are promoted through nature-based territorial marketing. Several of the INTEGRAL case study countries (e.g. Germany, Ireland, Italy, Lithuania, the Netherlands, and Slovakia) have reported a **net gain in the relevance of recreation-based activities in the surveyed landscapes**. They cover a wide range of possibilities and recreational activities such as **walking, hiking, horse riding, running, mountain biking and cycling**. It was noted that these recreational activities, aside from generating job opportunities (e.g. environmental guides), played a significant role in local economies (e.g. in Italy). Recreational activities in the Netherlands were rather seen as an additional source of income diversification. For some of the case study countries (e.g. Germany Ireland, and Italy) it was also noted that certain forest landscapes were more suitable for recreation than wood production. This highlights a commonly occurring **trade-off between tourism use and timber production and in between leisure activities** within the same landscape. The recreational non-wood uses of forests have essentially **triggered conflicts among and between forest users and forest owners** (SYLVAMED, 2012). Even more, the supply of recreational opportunities in public forests was found to be influenced by the installation and maintenance of recreational facilities. In principle, such facilities can generate extra costs, however, in most of the case studies (e.g. Lithuania) they are supplied free of charge to the public. Recreational services can as such be viewed as non-market services that are sensitive to public expenditures. Hence, a reduction in public expenditure could lead to a decrease in the supply of such forest-related services.

Though ecosystem goods and services are highly valued by forest owners, both for **income generation** (e.g. picking mushrooms for selling) and **subsistence purposes** (e.g. food provision) most of the INTEGRAL case studies have no active management of NWFP. INTEGRAL research found that while NWFPs are significant in all INTEGRAL countries, the case studies differ significantly concerning the importance that is assigned to different types of non-wood forest goods and services. In the case of Portugal for instance, established routines for



harvesting and a reputable market for NWFPs can be found. In Italy, the provision of NWFPs is linked to tourist-activities whereas hunting is a relevant source of income for forest owners in Sweden. In other cases, NWFPs are used for subsistence or as a means of diversifying revenue streams and dispersing financial risks. Although some figures exist, it is difficult to assess the financial benefits from NWFPs. For example, in the case of Lithuania, it was noted that many of the benefits generated by NWFPs were part of the grey economy. Another example is Sweden where forest owners are not obliged to pay income tax on the sale of wild berries and mushrooms (for a fixed sum). So, while NWFPs clearly play a major role in rural employment and income generation, they remain an **informal sector** that is not visible in national economic statistics.

In a future perspective, INTEGRAL research demonstrates that the provision of marketable non-wood forest products (e.g. hunting, forest berries and mushrooms) will not become less important and has to be taken into account as well in the future. Tourism and urban utilization of forests are expected to increase, along with a wide range of recreational activities. These future trends stress the **growing importance of NWFPs in terms of guaranteeing ecological health and keeping up profitable wood production** in combination with addressing new demands for non-wood goods and services.

TAKE HOME MESSAGES: Non-wood forest products and sustainable forest landscape management



FORESTS AND NON-WOOD FOREST PRODUCTS – THE EXAMPLE OF CORK

Photo: I. Melo

- The governance of non-wood forest products and other ecosystem services is subject to a fragmented policy regime and partly conflicting demands both horizontally (across countries) and vertically (across EU, national and regional levels).
- Non-wood forest products (e.g., mushrooms, berries, hunting) and other ecosystem services (e.g., tourism, recreation, public health) are very significant in the EU countries under study, mainly for income generation, subsistence, and public health and leisure benefits.
- The provision of marketable NWFPs, tourism and urban utilization of forests, are however expected to increase, which stresses the growing importance (or potential) of NWFPs to help ensure ecological health and maintain profitable wood production.
- Hence, there is a need for an integrated forest management approach to address trade-offs between and among non-wood forest products (wildlife management) and ecosystem services (recreation, nature conservation) on the one hand and timber production on the other hand at the landscape level.

4. Conclusions and recommendations

INTEGRAL research demonstrates that the implementation of sustainable forest management is embedded in a **fragmented EU forest-related policy framework** that is characterized by different sectoral interests, incoherent policy targets and institutional competition. The new EU Forest Strategy seems not sufficient to address this challenging situation because it remains rather a general, non-binding policy framework that does not clearly prioritize, but rather lists several EU forest-related policy targets. Consequently there is only **little policy coordination between forest-related sectors (horizontal incoherence) at EU, national and subnational levels of governance (vertical incoherence)**. The general and flexible approach of the EU Forest Strategy by itself does not necessarily present a policy problem. In fact, it reinforces the interests of Member States that forestry matters are mainly regulated by the EU and international markets, and domestic forest laws. Furthermore the flexibility allows to adapt to regional and national specific contexts. However, the



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combination of a less institutionalised EU forest policy and the strong presence of a variety of other well-established, legally-binding EU forest relevant policy domains (e.g., rural development, bioenergy, climate change, nature conservation, water protection, timber legality etc.) create the risk that forests become a makeshift area to fill voids and/or serve policy needs in the other policy domains. That is, forests seem to be integrated in other and more powerful EU policy domains to serve their particular sectoral interests. In turn, this unidirectional integration reinforces the major challenges in balancing timber production and sustainable forest management with the objectives of other policies. In addition, recreation and the use of non-wood forest products fall outside the EU forest policy framework despite their ever growing importance for society and the challenge of integrating them with other forest land uses.

One policy and management approach to address the aforementioned challenges is to argue for **improved coordination and coherence through forest policy integration in the EU**. Policy integration can be set as a common EU objective for forests that could become a fundamental principle for contributing to comprehensive sustainable development through effective implementation of sustainable forest management and multifunctional forestry. To be clear, this is not a call to increase the regulatory burden for the forest sector, particularly recognising the fact that increased regulatory burden is often used as an argument against any new forest-relevant EU law or the Negotiations on Pan-European Legally-binding Agreement on Forests). Rather, it is argument for **giving a powerful voice to integrated forest management at the landscape level in Europe**. That is, an integrated approach would need to find more effective ways to resolve the trade-offs and challenges related to contradictory policy objectives and competing forest land-use demands at the level of forest landscapes across Europe.

To successfully introduce an integrated approach towards forest policy and management in Europe, several principles and steps need to be taken into account. First, a comprehensive **assessment of the current state of forest policy integration** is required. With this policy paper, such an assessment has been delivered. It should help identify key policy issues, management areas and implications for practice that lack full and multi-directional integration. Second, as attempted with this policy paper, **the key policy, institutional, socio-economic and ecological factors** which have driven and/or are likely to drive the lack of integration and its implications in practice need to be identified and evaluated.

Third, **ways and means to improve coherence and strengthen coordination** need to be developed, discussed and implemented in a carefully designed and steered process by stakeholder and policy actors. This step also includes the **definition of shared goals for the forest and the other relevant sectors** through cross-sectoral coordination and communication. The key to managing forest in the future resides in developing a common vision and shared goals for an integrated forest policy and management, starting from the forest policy perspective.

Last, not least, the incoherent old policy and management framework has to be supplemented or replaced by an **integrated forest policy and management approach** that seeks to stimulate the development of coherent policy and economic frameworks addressing different forest-related policies and management practices. This is also a policy and management framework that **acknowledges and addresses trade-offs** related to the sustainable use and conservation of forests through different policy instruments (e.g. subsidies, information, performance standards) and market incentives in a coordinated way.

In order to design and implement the aforementioned steps, it is recommended to install **participatory decision-making processes on the sub-national (landscape) level**, where different demands and policies must be balanced (see section 1) and to connect these to similar processes **on the national and European levels** in a bottom-up approach. Designing innovative processes of integrated, multi-level forest governance requires the explicit identification and management of trade-offs between forest land uses through broader participation and policy learning. These participatory processes have to **involve all relevant actors**, including but not limited to policy-makers, administrators, forest owners and forest managers, stakeholder groups, civil society, scientists and consultants. INTEGRAL pre-tested this approach in terms of design in the case study areas, but it



needs full implementation beyond a research project's goals and time line. It would also have to involve appropriate **conflict management procedures**. If existing rifts between the actors and their interests cannot be bridged through exchange of knowledge and experience, and mutual learning, they need to be addressed through an appropriate mix of policy instruments. There is a further need to maintain **systematic monitoring of implementation** (e.g. to record overlaps, conflicts, inconsistencies, but also potential synergies between different forest-related policies), and mechanisms that allow for continuous and systematic revision of the forest policy integration approach based on feedback from monitoring and participatory discussions.

Policy integration is not an easy task. It can be a painful process as it involves multiple actors with their particular interests, values and beliefs and power resources. It also involves the recognition of trade-offs and the necessity to prioritize objectives and identify the most adequate policy level to make priority decisions. Hence, such a process requires time and clear commitment of the involved actors, which in the end should lead to rewarding results.

The key features of an integrated forest policy and management approach can be summarized as follows:
It is a process that ...

- ... **connects** long- and short-term thinking in forest policy and management.
- ... **brings together** interested actors (e.g. forestry, bioenergy, climate change, rural development, nature protection, recreation) and the different perspectives and issues at stake to stimulate joint visions and actions.
- ... **promotes** societal coordination by participatory forward-looking that helps involved actors develop a common understanding of present and future challenges and opportunities.
- ... **encourages** mutual policy learning through communicative actions that can gradually form a broader network and stimulate cooperation between actors and thereby overcome societal tensions.
- ... **identifies and communicates** central points of concern and trade-offs related to forest land-use demands so that they can be appropriately addressed and managed.
- ... **stimulates** the development of a coherent policy and socio-economic framework that addresses different forest-related policies and management practices.
- ... **manages conflicts** related to the sustainable use and conservation of forests in a coordinated way through the application of different policy instruments (e.g. subsidies, information, performance standards, etc.) and market incentives.

Further research should continue investigating e.g. what difference this approach could make in real-life settings in the forest landscapes, how mutual learning through communicative actions could succeed in overcoming societal tensions or how appropriate policy instrument mixes would look like.



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